



WisDOT
RESEARCH
•PROGRAM•

2012
Annual Report

From the Research Administrator

To the transportation research community:

I am pleased to present to you the Wisconsin Department of Transportation's 2012 Annual Report on research activities. This report discusses the programs managed directly by the Research & Communication Services Section as well as initiatives that represent partnerships across the department, state and nation.

Change is inevitable, and the past year continued to bring new opportunities and challenges to the WisDOT Research Program. We welcomed new leadership to the Wisconsin Highway Research Program with Dr. Tuncer Edil, Angela Pakes Ahlman and Dr. Ali Soleimanbeigi of the University of Wisconsin – Madison. The department also welcomed Kimberley Dinkins and Diane Gurtner to its ranks.

A major change came with the enactment of the federal MAP-21 authorization and a resulting redirection of a portion of federal research funds starting in 2013. While the financial impact did not occur in 2012, the Research Program needed to plan carefully to ensure that the 2013 program will fulfill key research objectives for the department within the expected financial constraints.

Through all of these staffing and financial changes, I am glad to note that the WisDOT Research Program remains an agent of positive change for Wisconsin's transportation industry. Research projects and initiatives in 2012 examined new material specifications, new techniques for testing products, new methods for managing projects and new ways to improve agency operations. Change for the better does not just happen, and the positive differences made through WisDOT's research activities come through the dedication and expertise of staff, partners, consultants and research institutions.

I encourage you to review this report, share its findings with your colleagues and continue your involvement with WisDOT's research activities. The department welcomes feedback and collaboration as we seek to remain an agent of positive change. I look forward to another great year of research activities to improve transportation in Wisconsin.

Sincerely,

Daniel Yeh
Chief, Research & Communication Services Section

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This is a report of research and technology transfer activities carried out by the Wisconsin Department of Transportation through the Part 2 research portion of the State Planning and Research Program of the Federal Highway Administration, U.S. Department of Transportation. The report describes activities during Federal Fiscal Year 2012, covering October 1, 2011, through September 30, 2012.

Program Overview

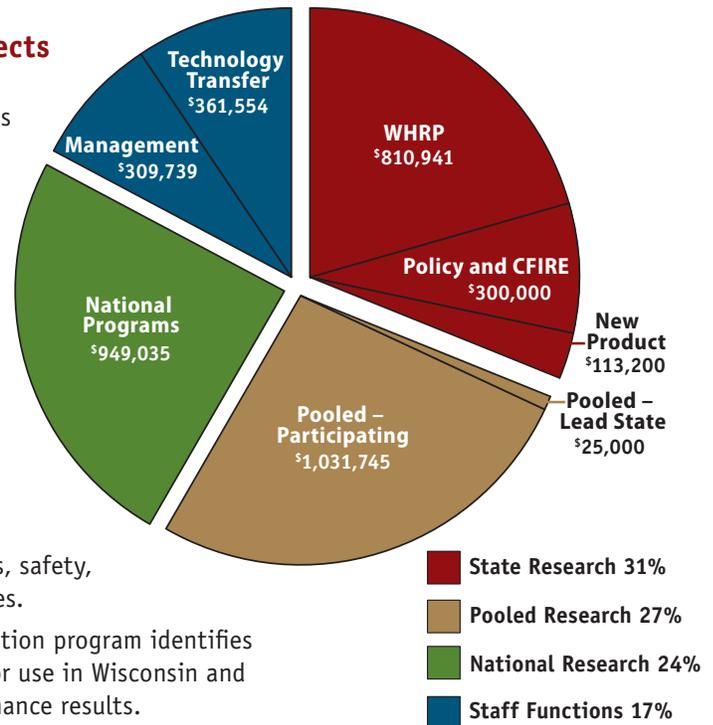
WisDOT manages a \$3.9 million program for research, library and technology transfer services. The program provides applied research solutions and knowledge transfer to support the wide array of topics, modes and applications across the department.

About 90% of WisDOT research funds come from the federal State Planning & Research (SPR) part 2 program. In federal fiscal year 2012, the department leveraged these funds with state dollars and partnered with universities, consultants, other state DOTs and national partners to deliver results on a variety of levels. Below is a summary of the overall program structure, and the pages following highlight the past year's work.

State-based research projects

Almost one-third of the research funding is for projects that address needs specific to Wisconsin:

- The Wisconsin Highway Research Program (WHRP) examines better ways to design, build and reconstruct the state highway network. Established in 1998, WHRP is managed through a partnership with the University of Wisconsin – Madison.
- The Policy Research Program supports projects addressing multimodal planning, operations, safety, economic or environmental issues.
- The New Product Method Evaluation program identifies suitable products or methods for use in Wisconsin and communicates data and performance results.



Pooled fund projects

Wisconsin participates in 46 Transportation Pooled Fund (TPF) projects. The TPF program pools resources to investigate problems that are common to states based on topic or geography. In FFY 2012, Wisconsin served as lead state to start TPF-5(270), Recycled Materials Resource Center 3rd Generation, utilizing the resources of UW – Madison.

National research

Almost one-quarter of WisDOT's research program supports national research initiatives through the Transportation Research Board (TRB) and the National Cooperative Highway Research Program (NCHRP). These programs examine national priorities and set industry-wide standards that are implemented by Wisconsin and throughout the nation.

Technology transfer & library services

WisDOT uses its technology transfer and library services to more effectively disseminate research findings and encourage implementation of results, not just from WisDOT-based projects but also from the nation and the world.

Program management

The department works with internal and external partners to carefully scope research ideas, match projects to appropriate researchers, oversee the conduct of research and deliver effective results.

WHRP Featured Research

0092-04-15 Bridge Integrated Analysis and Decision Support – Case Histories Additional Phases

Final report and brief: <http://wisdotresearch.wi.gov/project?id=118>

Collisions and severe weather may leave highway bridges with impact damage, fire damage, fatigue cracking or scour that structurally impair them. According to NCHRP, vehicle collisions inflict damage on about 200 prestressed concrete bridges annually. Eighty percent of these collisions are caused by over-height trucks. The primary objective of the study was to build upon the Phase I study which collected data from 16 bridges in a Bridge Incident Response Database (BIRD), by developing a decision support system linkable to BIRD that would assist transportation officials responding to bridge incidents. Specific objectives were to develop an easily used Bridge Emergency Expert System based upon expert knowledge from Wisconsin case histories.

IMPACT: The new system will help transportation personnel who respond to bridge incidents make quick decisions. The system will not replace the judgment and action of experts and experienced engineers but will help provide efficient, suitable responses to emergencies.

0092-08-08 Reduction of Minimum Required Weight of Cementitious Materials in Concrete Mixes

Final report and brief: <http://wisdotresearch.wi.gov/project?id=52>

Concrete mixtures contain crushed rock or gravel, and sand, bound together by Portland cement in combination with supplemental cementitious materials (SCMs), which harden through a chemical reaction with water. Portland cement is the most costly component of concrete mixtures, and its production creates significant amounts of greenhouse gases. To reduce costs and environmental impacts, current WisDOT practice allows for replacement of a portion of Portland cement SCMs such as coal fly ash or slag cement, both industrial by-products of coal and iron production, respectively. This research was undertaken to help determine the minimum amount of cementitious material to use in concrete mixtures while preserving pavement performance.

IMPACT: Based on the results, researchers found that certain mixes with reduced cementitious material content could be both workable and durable. WisDOT is sponsoring additional research seeking the development of guidelines for optimized concrete mix design with results expected in late 2014.

0092-09-04 Evaluation of Constructed Cast-In-Place (CIP) Piling

Final report and brief: <http://wisdotresearch.wi.gov/project?id=76>

Most of Wisconsin's approximately 13,700 bridges on state and local highway systems are supported with tubular piles—steel cylinders filled with concrete that is poured at the construction site. The piles are driven into the soil to support retaining walls and bridges. Engineers determine the size and number of Cast-In-Place (CIP) piles needed for a project based on the piles' load-bearing capacity and the frictional characteristics of the soil at the site. The objective of the project was to characterize the axial capacity of typical CIP piles as a means to evaluate which design approach is more representative of the piles used by WisDOT in bridge and retaining wall structures. The research would quantify the effect of composite action in pile capacity by considering the actual compressive strength of the in-place concrete which free-falls into the steel shells as it is poured and the composite action between the concrete core and the steel shell.

IMPACT: This study may lead to revisions in the WisDOT Bridge Manual to reflect load capacities for CIP piles.

WHRP Steering Committee

Daniel Yeh (Chair)
WisDOT Research & Communication Services Section

Jack Arseneau
Wisconsin Earthmovers Association

Scot Becker
WisDOT Bureau of Structures

Dave Brose
American Council of Engineering Companies of Wisconsin

Rebecca Burkel
WisDOT Bureau of Technical Services

Beth Cannestra
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Wisconsin Concrete Pavement Association

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Technical
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Committee
Chairs*

Flexible Pavements

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Geotechnics

Jeff Horsfall
WisDOT Bureau of
Technical Services

Rigid Pavements

Barry Paye
WisDOT Northeast Region

Structures

Bill Oliva
WisDOT Bureau
of Structures

WHRP Featured Research (continued)

0092-10-06 Effects of Recovered Binders from Recycled Shingles and Increased RAP (Recycled Asphalt Pavement) Percentages on Resultant Binder PG (Performance Grade)

Final report and brief: <http://wisdotresearch.wi.gov/project?id=22>

The use of reclaimed asphalt pavement (RAP) and recycled asphalt shingles (RAS) in asphalt concrete is increasing due to economic and environmental benefits. These recycled materials reduce the amount of virgin aggregate and virgin asphalt binder required to produce asphalt concrete resulting in significant cost savings. Their use reduces the demand on natural resources, energy and landfill space as well. The Federal Highway Administration increasingly encourages use of this green highway technology. This research evaluated the properties of recycled asphalt binders from Wisconsin sources. Continuous grading properties were measured for 18 recycled binder sources: 12 RAP sources and 6 RAS sources. The data were used to evaluate the binder replacement criteria contained in the 2011 WisDOT Standard Specifications for Highway and Structure Construction using a reliability analysis.

IMPACT: The researchers recommend new limits for RAP and RAS to ensure pavement performance. WisDOT will evaluate its standards and asphalt mixing charts to improve the reliability of the low temperature grade of the binder in the mixtures when recycled sources are used.

Policy Featured Research

0092-10-19 Addressing Elderly Mobility Issues in Wisconsin

Final report and brief: <http://wisdotresearch.wi.gov/project?id=795>

Aging baby boomers pose significant challenges to Wisconsin's existing transportation infrastructure and specialized transit programs. Projections indicate that by 2035, residents age 65 and over will comprise nearly a quarter of the population of Wisconsin. When elderly drivers are forced to stop driving or self-regulate in response to declining abilities and safety concerns, they face increased isolation from social, family, and civic activities and decreased access to medical services. These safety and social ramifications demand an examination of the state's current driver licensing and education practices, infrastructure design protocols, and specialized and public transit efforts. This report provides analysis of Wisconsin's existing services, coordinated by the DOT and other state agencies; collects information from elderly residents; and reviews national and international best practices to allow WisDOT to better manage approaching demographic challenges.

0092-10-20 Best Practices from WisDOT Mega-projects and ARRA Projects

Final report and brief: <http://wisdotresearch.wi.gov/project?id=796>

In 2004 the Marquette Interchange Project became Wisconsin's first highway mega-project (over \$500 million). During the course of the project, WisDOT developed a number of new techniques, methods, processes and procedures for project management. The department continued to utilize many of these methods on the \$1.9 billion, I-94 North-South Freeway Project starting in 2009. Also, the federal government required a slate of project and financial management tools for projects funded through the American Recovery and Reinvestment Act of 2009 (ARRA). WisDOT's senior management team recognized the benefits of many of these new practices. However, there was a need for formal evaluation of their effectiveness or potential applicability to other projects. This policy research study was executed to identify and evaluate the best practices used on these projects and develop an implementation methodology for the most effective best practices to be used in managing future highway construction projects. WisDOT is implementing the results of this study into procedures to manage a new generation of mega-projects.

*Research
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Advisory
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Daniel Yeh, Chair
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Pooled Fund Featured Research

TPF-5(148) & TPF-5(232)

The Effects of Implements of Husbandry “Farm Equipment” on Pavement Performance

Final report and brief: <http://www.pooledfund.org/Details/Study/375>

Study of the Impacts of Implements of Husbandry on Bridges

Final report and brief: <http://www.pooledfund.org/Details/Study/460>

These studies are analyzing and testing load resistance and pavement response to agricultural equipment and other load bearing vehicles that travel rural roads. The objectives of TPF-5(148) are to determine the response under various types of agricultural equipment (including the impacts of different tires and additional axles) and to compare this response to that of a typical 5-axle semi tractor-trailer. The TPF-5(232) study focuses on determining how farm implements distribute their loads within a bridge structural system and provides recommendations for accurately analyzing bridges for these loading effects.

IMPACT: WisDOT is using the results of these studies to help guide a special multi-agency task force. The group will recommend changes to state, local and department practices to address the issue of heavy agricultural equipment on pavements and bridges.

TPF-5(042)

Aurora Program

Final report and brief: <http://www.pooledfund.org/Details/Study/189>

Since 1999, WisDOT has been a partner of The Aurora Program, an international program which aims to deploy Road Weather Information Systems (RWIS) to integrate state-of-the-art road and weather forecasting technologies with coordinated, multi-agency weather monitoring infrastructures. This will facilitate advancements in monitoring and forecasting road and weather conditions for efficient highway maintenance, and the provision of real-time information to travelers. A key aspect of the program is Friends of Aurora, which brings in vendors so that the group can discuss pressing issues. Through these efforts, Aurora nudged industry toward more effective and less expensive technologies and methodologies.

IMPACT: WisDOT was the project champion on a study to validate the use of non-invasive pavement temperature and slickness sensors. The project concluded that the sensors were appropriate for some uses, and WisDOT is now deploying its first unit in the Mitchell Interchange in Milwaukee.

TPF-5(105)

Transportation Library Connectivity

Final report and brief: <http://www.pooledfund.org/Details/Study/337>

In FFY 2012 WisDOT closed the first generation of the Transportation Library Connectivity pooled fund. This pooled fund tackles the ideas of better connecting the nation’s transportation libraries and creating a national transportation information infrastructure. The Transportation Library Connectivity pooled fund study is the first successful effort that provided transportation libraries and universities with continuous funding to collaborate and work on tasks and special projects. This collaboration improves services for each member library and ultimately works toward achieving the goal of establishing a national transportation knowledge network as recognized by the U.S. Congress (i.e. MAP-21) and as envisioned and described in key documents published by the National Academies and TRB.

IMPACT: WisDOT’s leadership of TPF-5(105) provided a much stronger network of resources and information for its library services. The department is currently working with members of the subsequent pooled fund to create better access to transportation information which includes finding more effective ways to retain and distribute research reports.

Pooled Fund Featured Research (continued)

TPF-5(172)

An Analytical Review of Child Mobility Assessments for School Site Programs

Final report and brief: <http://www.pooledfund.org/Details/Study/399>

This project evaluated the barriers that prevent students from safely walking and biking to school. The ongoing second stage of analysis will address methods of overcoming these barriers, such as development of Safe Routes to School (SRTS) “best practices” and tools to select and fund the most effective SRTS projects.

IMPACT: The study identified four barriers to walking and biking to school. WisDOT will use these and other recommendations to overcome the barriers. Through further analysis, the study will provide state-specific input regarding the roles of current SRTS stakeholders and how to implement a cost-effective statewide SRTS program. Testing methods utilized during this study evaluated the barriers to safe walking and biking to school on a nationwide scale, while also providing information to participating partners regarding the barriers that are unique to a particular state. This allows for broad-reaching impacts on SRTS throughout the United States, providing lessons and resources for established, as well as start-up, SRTS programs while promoting cost-effective measures.

University Transportation Center

In 2012, the WisDOT Research Program continued its support of the University Transportation Centers (UTC) through its partnership with the National Center for Freight & Infrastructure Research & Education (CFIRE) at UW – Madison. Utilizing CFIRE’s researchers, WisDOT funded two new research projects that supported both the department’s research needs while also keeping in line with UTC’s overall mission – to help advance knowledge and expertise that will help create a sustainable and efficient freight infrastructure. WisDOT Research Program staff currently serve on CFIRE advisory committees. In August, WisDOT partnered with CFIRE to host the 2012 Mid-Continent Transportation Research Forum, where 150 participants discussed research projects and initiatives.

National Research Programs

TRB & NCHRP

WisDOT supports the ongoing national research conducted by the Transportation Research Board (TRB).

TRB is one of six major divisions of the National Research Council— a private, nonprofit institution that is the principal operating agency of the National Academies in providing services to the government, public, and scientific and engineering communities. As a state DOT, WisDOT is a “Core Program Sponsor” of TRB through the Research Program.

Participation in this program gives WisDOT a voice in setting national research priorities and agendas. Additional benefits of this program include free registration to the TRB Annual Meeting, free participation in webinars, online and print access to journals and publications as well as discounted fees for a variety of conferences and meetings.

The National Cooperative Highway Research Program (NCHRP) is one of TRB’s topically-based research programs. WisDOT has the opportunity to guide the NCHRP program through a national balloting process at both staff and executive levels.

Each year, the WisDOT Research Program supports TRB and NCHRP through prescribed amounts that are paid through 100% SPR2 funds. In 2012, WisDOT staff served on about 40 TRB and NCHRP committees, subcommittees, task forces, project panels as well as TRB State Representative activities.

Completed Research Projects

Program	FOS Billing ID	Performing Organization	Principal Investigator	Investment	WisDOT Project Manager	Project Title	Completion Date
Policy	0092-10-19	University of Wisconsin – Madison	Jason Bittner	\$93,350	Daniel Yeh	Addressing Elderly Mobility Issues in Wisconsin	11/18/2011
Policy	0092-10-20	University of Wisconsin – Madison	Awad Hanna	\$94,860	Daniel Yeh	Best Practices on Mega-projects and ARRA Projects	4/2/2012
UTC	0092-07-16	University of Wisconsin – Madison	Teresa Adams	\$97,623	John Cherney	Scoping Data Access and Integration Needs to Facilitate Better Management of Research Innovation	4/30/2012
UTC	0092-09-22	University of Wisconsin – Madison	Jessica Guo	\$79,517	Sandy Beaupré	Understanding and Modeling Freight Stakeholder Behavior	6/14/2012
UTC	0092-09-23	University of Wisconsin – Madison	Tracey Holloway	\$121,304	Patricia Trainer	Sustainable Freight Infrastructure to Meet Climate and Air Quality Goals	4/10/2012
UTC	0092-10-14	University of Wisconsin – Madison	Jessica Guo	\$88,000	Sandy Beaupré	Freight Model Improvement Project for ECWRPC	3/23/2012
WHRP – Flexible Pavement	0092-08-09	University of Wisconsin – Madison	Haifang Wen	\$139,896	Judie Ryan	Pre-Overlay Repair of Existing Concrete and Asphalt Pavements – Phase I	2/2/2012
WHRP – Flexible Pavement	0092-09-01	Advanced Asphalt Technologies, LLC	Ramon Bonaquist	\$149,835	Judie Ryan	Evaluation of Flow Number (Fn) as a Discriminating HMA Mixture Property	8/27/2012
WHRP – Flexible Pavement	0092-10-06	Advanced Asphalt Technologies, LLC	Ramon Bonaquist	\$69,991	Judie Ryan	Effects of Recovered Binders from Recycled Shingles and Increased RAP Percentages on Resultant Binder PG	1/18/2012
WHRP – Flexible Pavement	0092-10-07	Advanced Asphalt Technologies, LLC	Ramon Bonaquist	\$69,993	Judie Ryan	HMA Fatigue and Low Temperature Properties to Support MEPDG	1/18/2012
WHRP – Geotech	0092-06-04	HNTB Corporation	John Siwula	\$230,805	Robert Arndorfer	Construction Vibration Attenuation with Distance and its Effect on the Quality of Early-Age Concrete	10/31/2011
WHRP – Geotech	0092-08-12	University of Wisconsin – Milwaukee	Hani Titi	\$50,689	Robert Arndorfer	Determination of Resilient Modulus Values for Typical Plastic Soils in Wisconsin	11/11/2011
WHRP – Geotech	0092-09-04	Wagner Komurka Geotechnical Group	Van Komurka	\$90,000	Robert Arndorfer	Evaluation of Constructed Cast-In-Place (CIP) Piling	1/18/2012
WHRP – Geotech	0092-10-10	University of Wisconsin – Madison	Dante Fratta	\$64,432	Robert Arndorfer	Cone Penetrometer Comparison Testing	11/16/2011
WHRP – Rigid Pavement	0092-08-08	Michigan Tech University	Lawrence Sutter	\$186,075	James Parry	Reduction of Minimum Required Weight of Cementitious Materials in Concrete Mixes	12/22/2011
WHRP – Structures	0092-04-15	University of Wisconsin – Milwaukee	Al Ghorbanpoor	\$220,000	Travis McDaniel	Bridge Integrated Analysis and Decision Support – Case Histories Additional Phases	11/21/2011
WHRP – Structures	0092-10-12	University of Wisconsin – Madison	Michael Oliva	\$46,605	Travis McDaniel	Finite Element Analysis of Deep Wide-Flanged Prestressed Girders	11/11/2011
WHRP – Structures	0092-10-13	Collins Engineers, Incorporated	Michael Garlich	\$55,000	Travis McDaniel	Development of a Bridge Construction Live Load Analysis Guide	1/18/2012

Active Research Projects

Program	FOS Billing ID	Performing Organization	Principal Investigator	Investment	WisDOT Project Manager	Project Title
MMS	0092-09-30,-31	Marquette University	James Crovetti	\$219,962	Steve Krebs	Local Calibration of the Mechanistic Empirical Pavement Design Guide (MEPDG) Software for Wisconsin
Policy	0092-11-15	Texas A&M University	Laura Higgins	\$100,000	Brian DuPont	Understanding the Decision-making Process for Drivers faced with Lane Restrictions or Closures on WI Highways
Policy	0092-11-16	University of Wisconsin – Platteville	Samuel Owusu-Ababio	\$125,000	Laura Fenley	Evaluation of Impacts of Allowing Heavier Log Loads in Northern Wisconsin during Spring Thaw
Policy	0092-12-10	ETC Institute	Christopher Tatham	\$74,990	Peg Schmitt	WisDOT Customer Satisfaction
Policy	0092-12-14	University of Wisconsin – Madison	John Stevenson	\$35,347	John Swissler	Focus Group Assessments of Transportation Financing Options in WI
UTC	0092-10-21	University of Wisconsin – Madison	Jason Bittner	\$80,000	Daniel Yeh	Aligning Oversize and Overweight Permit Fees and Policies with Agency Costs
UTC	0092-12-09	University of Wisconsin – Madison	Teresa Adams	\$44,944	John Corbin	New Framework and Decision Support Tool to Warrant Detour Operations during Freeway Corridor Incident Management
UTC	0092-12-12	University of Wisconsin – Madison	Teresa Adams	\$45,000	Dennis Leong	Evaluating Export Container Pooling Options In Minn, Wisconsin and Michigan's Upper Peninsula
WHRP – Flexible Pavement	0092-09-02	Marquette University	James Crovetti	\$71,934	Tom Brokaw	Performance Evaluation of Tack Coat Materials
WHRP – Flexible Pavement	0092-11-01	University of Wisconsin – Platteville	Robert Schmitt	\$120,000	Judie Ryan	Investigation and Development of a Non-Destructive System to Evaluate Wi Asphalt Pavement Compaction Efforts and Properties
WHRP – Flexible Pavement	0092-11-02	University of Wisconsin – Milwaukee	Hani Titi	\$106,935	Judie Ryan	Base Compaction Specification Feasibility Analysis
WHRP – Flexible Pavement	0092-12-01	Advanced Asphalt Technologies, LLC	Donald Christensen	\$57,000	Judie Ryan	Refinement of Current WisDOT HMA Mixture App Guidelines Related to NMAAS and Aggregate Characteristics
WHRP – Flexible Pavement	0092-12-02	Advanced Asphalt Technologies, LLC	Ramon Bonaquist	\$139,995	Judie Ryan	Dev of Specs for use of WHA Tech in Delivering HMA Products Inclu of Non-Conven Mixt Such as SMAs, High RAP and RAS Content
WHRP – Flexible Pavement	0092-13-01	AMEC Environment & Infrastructure, Inc.	Gonzalo Rada	\$120,000	Judie Ryan	Evaluation of Design Criteria and Field Performance of Rubblized Concrete Pavement Systems in WI – Phase 1
WHRP – Flexible Pavement	0092-13-02	University of Wisconsin – Madison	Hussain Bahia	\$70,000	Judie Ryan	Field Evaluation of Wisconsin Modified Binder Selection Guidelines
WHRP – Geotech	0092-08-11	University of Wisconsin – Madison	Dante Fratta	\$103,914	Robert Arndorfer	Effective Depth of Soil Compaction in Relation to Applied Compactive Energy
WHRP – Geotech	0092-09-05	University of Wisconsin – Madison	Dante Fratta	\$109,893	Robert Arndorfer	Evaluation of the Foundation Movements of Transportation Structures
WHRP – Geotech	0092-10-08	University of Wisconsin – Milwaukee	Habib Tabatabai	\$59,991	Robert Arndorfer	Investigation of Testing Methods to Determine Long Term Aggregate Durability of Various Types of Wisconsin Aggregate Sources Phase II

Active Research Projects

Program	FOS Billing ID	Performing Organization	Principal Investigator	Investment	WisDOT Project Manager	Project Title
WHRP – Geotech	0092-10-09	University of Illinois	James Long	\$60,000	Jeff Horsfall	Comparison of LRFD and LFD Cast-In-Place Pile Design and Construction Methods
WHRP – Geotech	0092-11-03	University of Wisconsin – Madison	Dante Fratta	\$74,000	Jeff Horsfall	Evaluating the Methodology and Performance of Jetting and Flooding Granular Backfill Materials
WHRP – Geotech	0092-11-04	University of Wisconsin – Platteville	Mark Meyers	\$63,951	Jeff Horsfall	Analysis of Trends/Correlations of Historical WisDOT Soil Lab Test Results Through Dev of an Electronic Database
WHRP – Geotech	0092-12-03	University of Wisconsin – Madison	Dante Fratta	\$41,998	Jeff Horsfall	Lateral Deflection Contribution to Settlement Estimates
WHRP – Geotech	0092-12-07	University of Wisconsin – Milwaukee	Hani Titi	\$94,989	Jeff Horsfall	Predicting Scour of Bedrock in Wisconsin
WHRP – Geotech	0092-12-08	University of Illinois	James Long	\$95,000	Jeff Horsfall	Static Pile Load Tests on Driven Piles into Intermediate-Geo Materials
WHRP – Geotech	0092-13-03	University of Wisconsin – Milwaukee	Qian Liao	\$74,998	Jeff Horsfall	Understanding and Complying with Storm Water Mitigation Guidelines from the EPA
WHRP – Rigid Pavement	0092-10-11	University of Wisconsin – Madison	Steven Cramer	\$179,999	James Parry	Laboratory Study of Concrete Properties to Support Implementation of the new AASHTO Mechanistic-Empirical Design Guide
WHRP – Rigid Pavement	0092-11-05	University of Wisconsin – Madison	Steven Cramer	\$102,000	Barry Paye	Laboratory Study of High-Performance Curing Compounds for Concrete Pavement
WHRP – Rigid Pavement	0092-11-06	Applied Pavement Technology, Incorporated	Thomas Van Dam	\$80,000	Barry Paye	Field Study of Air Content Stability in the Slip Form Paving Process
WHRP – Rigid Pavement	0092-12-04	Michigan Tech University	Lawrence Sutter	\$144,958	Barry Paye	Laboratory Study for Comparison of Class C Versus Class F Fly Ash for Concrete Pavement
WHRP – Rigid Pavement	0092-12-05	University of Wisconsin – Platteville	Samuel Owusu-Ababio	\$50,000	Barry Paye	Longitudinal Cracking in Widened Portland Cement Concrete Pavements
WHRP – Rigid Pavement	0092-13-04	University of Wisconsin – Milwaukee	Konstantin Sobolev	\$199,185	Barry Paye	Laboratory Study of Optimized Concrete Pavement Mixtures
WHRP – Structures	0092-09-07	Marquette University	Chris Foley	\$192,542	Travis McDaniel	Fatigue Risks in the Connection of Sign Support Structures Phase II and III
WHRP – Structures	0092-11-07	University of Wisconsin – Milwaukee	Al Ghorbanpoor	\$145,000	Travis McDaniel	Aesthetic Coatings for Bridge Components
WHRP – Structures	0092-11-08	Marquette University	Baolin Wan	\$77,000	Travis McDaniel	Rapid Repair and Strengthening of Bridge Substructures
WHRP – Structures	0092-12-06	University of Wisconsin – Milwaukee	Habib Tabatabai	\$166,992	Travis McDaniel	Evaluation of Thin Polymer Deck Overlays and Deck Sealers
WHRP – Structures	0092-13-05	University of Wisconsin – Milwaukee	Al Ghorbanpoor	\$120,000	Bill Oliva	Aesthetic Coatings for Concrete Bridge Components

Pooled Fund Research Projects

Project Number	Title (Click title to go to Web page for each project)	Funding Amount Recommendation	Current or Recommended Technical Representative	Lead Agency
LRFD	LRFD Specification Maintenance Technical Service Program	\$10,000	Scot Becker	AASHTO
NTPEP	National Transportation Product Evaluation Program	\$7,500	Peter Kemp	AASHTO
SPR-2(207)/ TPF-5(052)	Transportation Management Center Pooled Fund Study	\$50,000	Paul Keltner	FHWA
SPR-3(042)	Aurora Program	\$25,000	Mike Adams	IA
TPF-5(021)	Base Funding for the North Central Superpave Center	\$25,000	Tom Brokaw	IN
TPF-5(063)	Improving the Quality of Pavement Profiler Measurement	\$15,000	Bill Duckert	FHWA
TPF-5(065)	Traffic Control Device (TCD) Consortium	\$20,000	Tom Notbohm	FHWA
TPF-5(081)/ SPR-3(075)	Smart Work Zone Deployment Initiative	\$40,000	Tom Notbohm	IA
TPF-5(099)	Evaluation of Low-Cost Safety Improvements	\$5,000	John Bridwell	FHWA
TPF-5(117)	Development of Performance Properties of Ternary Mixes	\$16,000	Jim Parry	IA
TPF-5(129)	Recycled Unbound Pavement Materials (MnROAD Study)	\$15,000	Tom Brokaw	MN
TPF-5(132)	Investigation of Low Temperature Cracking in Asphalt Pavements – Phase II (MnROAD Study)	\$20,000	Barry Paye	MN
TPF-5(153)	Optimal Timing of Preventive Maintenance for Addressing Environmental Aging in HMA Pavements (MnROAD Study)	\$15,000	Tom Brokaw	MN
TPF-5(159)	Technology Transfer Concrete Consortium	\$5,000	Jim Parry	IA
TPF-5(164)	Fish Passage in Large Culverts with Low Flows	\$15,000	Rodney Taylor	FHWA
TPF-5(169)	Investigation of Curved Girder Bridges with Integral Abutments	\$7,500	Dave Kiekbusch	IA
TPF-5(176)	Traffic Analysis and Simulation	\$50,000	John Corbin	FHWA
TPF-5(179)	Evaluation of Test Methods for Permeability (Transport) and Development of Performance Guidelines for Durability	\$15,000	Jim Parry	IN
TPF-5(183)	Improving the Foundation Layers for Concrete Pavements	\$35,000	Jeff Horsfall	IA
TPF-5(189)	Enhancement of Welded Steel Bridge Girders Susceptible to Distortion-Induced Fatigue	\$15,000	Craig Wehrle	KS
TPF-5(193)	Midwest States Pooled Fund Crash Test Program	\$66,000	Erik Emerson	NE
TPF-5(202)	HY-8 Culvert Analysis Program – Phase Three of Development Efforts	\$5,000	Rodney Taylor	FHWA
TPF-5(205)	Implementation of Concrete Pavement Mixture Design and Analysis (MDA) Track of Concrete Pavement Road Map	\$10,000	Jim Parry	IA
TPF-5(206)	Research Program to Support the Research, Development, and Deployment of System Operations Applications of Vehicle Infrastructure Integration	\$50,000	John Corbin	VA
TPF-5(210)	In-situ Scour Testing Device	\$15,000	Najoua Ksontini	FHWA
TPF-5(213)	Performance of Recycled Asphalt Shingles in Hot Mix Asphalt	\$42,500	Judie Ryan	MO

Pooled Fund Research Projects

Project Number	Title (Click title to go to Web page for each project)	Funding Amount Recommendation	Current or Recommended Technical Representative	Lead Agency
TPF-5(215)	Transportation Engineering and Road Research Alliance	\$10,000	Rory Rhinesmith Steve Krebs	MN
TPF-5(218)	Clear Roads (Test and Evaluation of Materials, Equipment and Methods for Winter Highway Maintenance)	\$25,000	Mike Sproul	MN
TPF-5(219)	Structural Health Monitoring System	\$30,000	Scot Becker	IA
TPF-5(224)	Investigation of Jointed Plain Concrete Pavement Deterioration at Joints and the Potential Contribution of Deicing Chemicals	\$15,000	Jim Parry	IA
TPF-5(225)	Validation and Implementation of Hot-Poured Crack Sealant	\$25,000	Paulette Hanna	VA
TPF-5(227)	Continued Advancements in Load and Resistance Factor Design (LRFD) for Foundations, Substructures and Other Geotechnical Features	\$20,000	Jeff Horsfall	FHWA
TPF-5(229)	Characterization of Drainage Layer Properties for MEPDG	\$30,000	Laura Fenley	VA
TPF-5(232)	Study of the Impacts of Implements of Husbandry on Bridges	\$15,000	Travis McDaniel	IA
TPF-5(233)	Technology Transfer Intelligent Compaction Consortium (TTICC)	\$9,000	Judie Ryan	IA
TPF-5(237)	Transportation Library Connectivity	\$15,000	John Cherney	MO
TPF-5(238)	Design and Fabrication Standards to Eliminate Fracture Critical Concerns in Two Girder Bridge Systems	\$20,000	Scot Becker	IN
TPF-5(242)	Traffic and Data Preparation for AASHTO MEPDG Analysis and Design	\$16,667	Laura Fenley	LA
TPF-5(243)	Motorcycle Crash Causation Study	\$15,000	Greg Patzer	FHWA
TPF-5(247)	Field Testing Hand-held Thermographic Inspection Technologies Phase II	\$30,000	Travis McDaniel	MO
TPF-5(250)	Executive Workshops on Strategies and Best Practices for State Departments of Transportation to Support Commercialization of Electric Vehicles (EV) and Infrastructure	\$20,000	Linda Lewis	WA
TPF-5(253)	Member-level Redundancy in Built-up Steel Members	\$25,000	Travis McDaniel	IN
TPF-5(254)	Bulb-T Beam As Alternate ABC to Side-By-Side Box Beam	\$20,000	Dave Kiekbush	MI
TPF-5(255)	Highway Safety Manual Implementation	\$10,000	Rebecca Szymkowski Angela Adams	FHWA
TPF-5(256)	HY-12 Storm Drain Hydraulic Analysis Program – Phase Two of Development Efforts	\$10,000	Rodney Taylor	FHWA
TPF-5(258)	Traffic Signal Operations & Manual Pooled Fund Study	\$25,000	Joanna Bush Anne Reshadi	IN
TPF-5(259)	Imaging Tools for Evaluation of Gusset Plate Connections in Steel Truss Bridges	\$25,000	Joshua Dietsche	OR
TPF-5(268)	Regional Sustainable Pavement Consortium	\$25,000	Jed Peters	VA
TPF-5(270)	Recycled Materials Resource Center 3G	\$25,000	Steve Krebs	WI

Library / Technology Transfer

Technology Transfer

The Research & Library Unit provides information services for WisDOT staff and supports implementation of research results. Here are some highlights of the services provided in FFY 2012.

Peer Exchanges – To foster sharing of best practices, WisDOT hosts peers from other states and FHWA to examine specific transportation issues through presentations and roundtable discussions. The topics of the three peer exchanges conducted were Social Media and Next Generation Technology, Alternative Methods of Driver Testing and Project Management for Highway Design Phase.

Transportation Synthesis Reports – TSRs are annotated reports that allow WisDOT technical staff and managers to learn from the experiences of other state DOTs. Twelve TSRs were completed in FFY 2012.

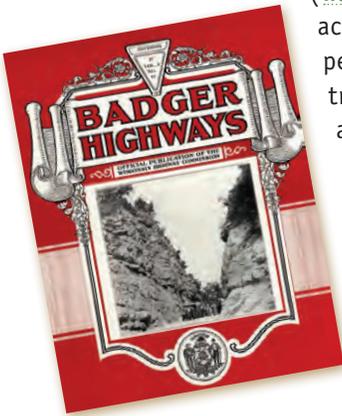
WisDOT library – The library staff handled close to 2,000 reference questions and completed 32 literature searches. The library also circulated over 5,000 items (books, reports, periodicals and articles).

WisDOT Digitization Project

The WisDOT Library with Wisconsin Heritage Online (WHO) (<http://wisconsinheritage.org/>) worked to digitize and make accessible many of the library's historical photographs, periodicals, newsletters, maps and videos relating to Wisconsin transportation history. WHO's mission is to inspire education and discovery by making Wisconsin's cultural heritage available online. Transportation is one of WHO's main subject areas.

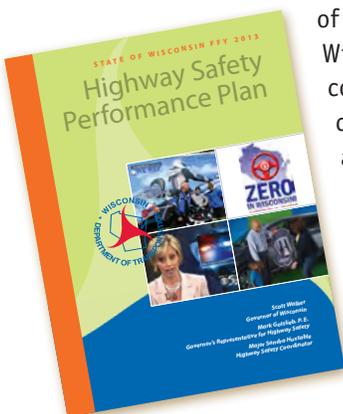
The partnership involves training WisDOT Library staff to create, manage and upload the digital collections. Web hosting is provided by the Milwaukee Public Library.

WHO currently has 50 members, and the WisDOT Library is the first Wisconsin state agency library to participate in this collaborative program.



Wisconsin Digital Archives

The Wisconsin Digital Archives is a collaborative effort involving the Wisconsin Resources for Lifelong Learning (Department of Public Instruction), the Wisconsin Historical Society, the WisDOT Library, and libraries from other state agencies. This collaboration provides permanent electronic access to web content located on Wisconsin state agency websites and allows state agencies to continue to fulfill their statutory obligation to participate in the Wisconsin Document Depository Program with electronic formats. WisDOT Library staff assist in identifying WisDOT documents to be archived before they disappear from ever-changing web sites and create catalog records for their ongoing access. Born-digital documents are the primary focus, but other items are added as well. The collection can be accessed at <http://www.wistatedocuments.org/>.



WisDOT Research & Library Unit Staff



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Common Acronyms

AASHTO	American Association of State Highway and Transportation Officials
ARRA	American Recovery and Reinvestment Act of 2009
CFIRE	National Center for Freight & Infrastructure Research & Education
DOT	Department of Transportation
FFY	Federal Fiscal Year
FHWA	Federal Highway Administration
NCHRP	National Cooperative Highway Research Program
R&L Unit	Research & Library Unit
SPR	State Planning and Research Program
TPF	Transportation Pooled Fund
TRB	Transportation Research Board
UTC	University Transportation Center
UW	University of Wisconsin
WHRP	Wisconsin Highway Research Program
WisDOT	Wisconsin Department of Transportation

