

RESEARCH UPDATE

JANUARY 2012

Research Executive Committee Sets Strategic Research Priorities

The Research Executive Committee (REC) met Nov. 29, 2011, to prioritize department research needs for the upcoming biennium. REC members selected 25 strategic research priorities across the following areas to guide researchers, stakeholders and MDOT staff who submit ideas for Fiscal Years 2014-2015.

- **Bridges and structures.** The REC is looking for optimal ways to implement prefabricated bridge elements. The committee also is interested in innovative materials and methods for rapid replacement of bridge joints, as well as bridge asset management and health monitoring.

- **Traffic and safety.** Research priorities include engineering improvements that enhance safety for older drivers and strategies for using the new Highway Safety Manual on MDOT projects. Also of interest is research that validates crash reductions from MDOT's use of rumble strips and confirms predicted mobility increases from optimizing signal timing.

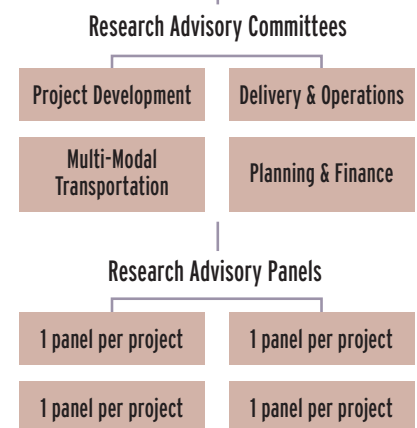
- **Mobility and systems operations.** The REC put an emphasis on research that quantifies the costs and benefits of investing in mobility for work zones and of applying intelligent transportation systems.

- **Design.** The REC highlighted the need for developing performance-based roadway standards for money-saving light-emitting diode, induction, plasma and other lighting types.

- **Maintenance.** Research is needed to develop snow removal performance measures that include both mobility and safety, to investigate pavement absorption of deicing materials and to apply highway winter maintenance strategies to airports.

- **Pavements.** The REC would like to see a synthesis of practice on the use of recycled materials, an implementation project for improved longitudinal joints and warranties, and an evaluation of effective pavement markings for highways and airports.

Research Executive Committee



Research Administration uses a tiered approach to identify, prioritize and manage research that engages both senior managers and MDOT subject-area experts.

In This Issue: Planning Ahead for Better Research

The focus of this issue of *Research Update* is on research needs and how MDOT staff and others can propose research for the upcoming biennium.

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- **Financial management.** Priority projects include studying the balance between cash and accrual-based capital management programs, and developing guidelines to improve management of consultant procurement and payment processes.

- **Planning.** Research topics should focus on maintaining programs during a time of financial uncertainty and on evaluating the effectiveness of program reforms.

- **Aeronautics.** The REC prioritized research on suppressing lightning strikes on lighting fixtures and measuring the volume of air traffic at airports not served by towers.

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Research Executive Committee Sets Strategic Research Priorities

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• **Passenger transportation.** The REC is interested in learning best practices for the layout and management of bus stops to improve safety and enhance traffic flow and transit ridership. The committee would like to evaluate the effectiveness of “Transit in the Roadway” in selected cities and track the level of service of the passenger transportation system statewide (both local and intercity). Finally,

what are the pros and cons of MDOT spurring innovation in transit bus technology, testing and safety?

REC members include Chief Operations Officer Greg Johnson, Chief Administrative Officer Laura Mester, Engineer of Research Steve Bower, and a region liaison. In addition, the committee includes executives who repre-

sent the following program areas: program/project development, delivery and operations, multi-modal transportation, and planning and finance.

To see all REC strategic research priorities, go to http://www.michigan.gov/documents/mdot/mdot_research_admin_2014-2015_research_priorities_370923_7.pdf.

Encouraging New Research Topics



I-275/Eureka Road interchange, west of the Detroit/ Wayne County Metropolitan Airport. Shown at upper left are traditional high-pressure sodium lights (along mainline I-275 in both directions and the northbound ramps), with pilot LED lights shown in the lower right (along the southbound ramps).

Staff throughout MDOT kicked off the next research biennium by contributing great new ideas to research. Research Administration staff met with region leadership teams, content specialists, and focus area managers in several areas within the department.

Who would know best the day-to-day problems of Michigan’s transportation system that might be solved by research? The answer is MDOT region and Transportation Service Center (TSC) staff who are on the front lines of serving the state’s traveling public and commercial shippers. With this in mind, Research Project Administration Manager Michael Townley visited each of the seven regions last fall to get staff members’ thoughts on needed research.

The visits yielded nearly 50 research

topics, from drive-by collection of soil and pavement data to the feasibility of regional transit hubs in the Upper Peninsula, and from precast slabs for patching concrete pavement to work zone screening to eliminate gawking and traffic slowdowns. The research topics were forwarded to the REC for consideration in setting the department’s strategic research priorities for the next biennium.

A bright, energy-efficient idea

One of the promising ideas coming out of the region visits was suggested by Metro Region Engineer Tony Kratofil. He called for research on innovative roadway lighting technologies such as light-emitting diodes, magnetic induction lamps and light-emitting plasma.

MDOT is a national leader in piloting these energy-efficient technologies for highway lighting. They use less energy and last longer than traditional lights, reducing operating and maintenance costs. DOT workers also benefit because they don’t need to face the hazards of traffic as frequently to replace burned-out lights.

“We hosted an innovative lighting demonstration for the other states as part of the AASHTO Annual Meeting in Detroit this past October,” says Kratofil. “MDOT also has highway lighting

pilots under way in Oakland County and in the Bay Region.”

The next step, though, will require focused research. “We’re trying to push the envelope a little,” he says, “but we need some help developing new standards that recognize and allow for applying the rapid advancements in lighting technology.”

Priorities for Bridge Committee

Another input to the REC meeting came from an October strategic planning meeting of the MDOT Bridge Committee, composed of technical experts from design, construction, materials, maintenance and experimental studies, and representatives from each region office and the Federal Highway Administration-Michigan Division.



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New Leadership for MDOT Research Administration

Effective Nov. 1, 2011, I assumed the role of MDOT Engineer of Research. I look forward to working with the Research Administration team along with staff throughout MDOT in my new role. Successful research can only be accomplished by all of us at MDOT working together with our external research partners in academia and the private sector. Having had the opportunity to participate in several past research initiatives, I have witnessed firsthand what the benefits of effective research can provide to MDOT and our customers.

My career with MDOT includes experience as the state pavement engineer. In addition, I have had the privilege of managing the Lansing and Brighton Transportation Service Centers for several years. These roles have allowed me to understand the importance of exploring new solutions to the many challenges faced by our department. Research outcomes can help us improve how we plan, develop, deliver, operate, and maintain all of the transportation assets for which we are responsible. My hope is that Research Administration will be viewed as a service group by all of you, wherever your responsibilities lie within MDOT.

As we launch our Call for Research Ideas, I invite everyone to consider how research can improve an MDOT process or specification, make our highways safer, save taxpayer dollars, or reduce traveler time. Please submit your ideas, as outlined in this issue of *Research Update*, and join us in putting research to work for all of us.



“I have witnessed firsthand the benefits that effective research can provide to MDOT and its customers.”

—Steve Bower
MDOT Engineer of Research

Encouraging New Research Topics

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After reviewing current and planned bridge research projects, the committee proposed four priority research areas for REC consideration:

- Advancing accelerated bridge construction.
- Investigating the durability of bridge elements.
- Innovating bridge asset management.
- Studying health monitoring of bridges.

“This was a very useful exercise,” says MDOT Bridge Development Engineer David Juntunen. “We looked at research already under way and then discussed where we still needed work. We wanted to develop five-year research focus areas so investigators can gear up to meet these longer term needs.”

Research Administration is ready to assist other functional areas at MDOT to define research ideas. Contact us at: mdot-research@michigan.gov.

New Requests for Proposals (RFP)

Watch the MDOT Contract Services Division Web site at www.michigan.gov/mdot/0,1607,7-151-9625_32842---,00.html for RFPs on the following research projects.

Focus Area	RFP Title
Safety, Systems Operations and Mobility	Development of Performance Measures for Non-Motorized Dynamics
Design and Geotechnicals	Freezing and Thawing of Frost-Susceptible Soils—Development of a Reliable Predictive Model
Bridges and Structures	Evaluation of Bridge Decks Using Nondestructive Evaluation (NDE) at Near Highway Speeds for Effective Asset Management
	Side-by-Side Probability for Bridge Design and Analysis
	Remote Monitoring of Fatigue-Sensitive Details on Bridges
	Design and Construction Guidelines for Strengthening Bridges Using Fiber-Reinforced Polymers (FRP)
	Evaluating Prestressing Strands and Post-Tensioning Cable in Concrete Structures Using Nondestructive Evaluation (NDE) Methods Including Joint Shear Wave Analysis

Call for Research Ideas (FY 2014-15 Research Biennium)

How can research help MDOT improve practices in planning, building and operating Michigan's transportation system? Research Administration is soliciting research project ideas in every business area. To submit an idea:

- Download the list of MDOT's strategic research priorities at www.michigan.gov/documents/mdot/mdot_research_admin_2014-2015_research_priorities_370923_7.pdf and the Research Idea Form (Form # 5315) available at mdotwas1.mdot.state.mi.us/public/webforms/public/5315.pdf.
- Complete the form with an idea that addresses a priority and e-mail it to mdot-research@michigan.gov by January 31, 2012.

If you have any questions or need assistance, contact us at 517-241-2780.

Program News

New name for Research, same Web address: With this year's reorganization, the former Office of Research and Best Practices has become Research Administration in the Bureau of Field Services. We can still be found at www.michigan.gov/mdotresearch.

MDOT Research Summit: This biannual event will be held in May 2012. Look for details in the coming months.

Research reports: Twenty-seven MDOT-sponsored reports, many just published in 2011, are available at michigan.gov/mdotresearch under Resources/Research Reports. Topics include improving bridges and pavements, mitigating traffic congestion, meeting the transportation needs of the elderly, and using roundabouts safely.



Research Administration

VISION: *To be a recognized leader in coordinating applied research and implementing results by identifying cutting-edge research topics, implementing research results and coordinating development of research projects. Our core strength results from a highly integrated network of dynamic partnerships among transportation professionals.*

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