



# RESEARCH UPDATE

MAY 2012

## Status of MDOT's 2014-2015 Research Program

MDOT Research Administration is in the midst of developing the 2014-2015 research program with the help of MDOT staff, managers and external stakeholders. This issue presents the timeline for selecting new projects for 2014-2015, provides an update on nine new research projects that will get under way in the fall of 2012, and highlights recent improvements to the department's research development process.

### In This Issue: Developing a Strategic Research Program

The focus of this issue of *Research Update* is on how Research Administration leverages the support of MDOT staff, executives and external stakeholders to select priority research projects for each biennium.

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### Contact Us

Phone: 517-241-2780  
E-mail: [mdot-research@michigan.gov](mailto:mdot-research@michigan.gov)  
Web site: [www.michigan.gov/mdotresearch](http://www.michigan.gov/mdotresearch)

### Improving Research Program Alignment

To further improve MDOT's research program, Research Administration, in collaboration with the Research Executive Committee (REC), has revised the three-tiered research management structure to include stronger participation by the region offices. (See page 2.) The four Research Advisory Committees (RACs)—Program/Project Development, Delivery/Operations, Multi-Modal and Planning/Finance—now will invite executives and subject-area experts from the regions to assist the RAC chairs and focus area managers with problem identification and project oversight. This change will make the program development process more inclusive, improving alignment of the research program with department goals and objectives.

### Developing a Strategic Biennial Program

With a solid support structure in place, Research Administration began developing the 2014-2015 program in response to the strategic research priorities set by the REC. In late November 2011, the REC met to discuss the program and identified 25 high-priority needs to guide the call for ideas, which ran from mid-December 2011 through January 2012 and resulted in the following submissions:

- 111 research ideas: 28 from MDOT staff, 80 from university researchers and three from consultant researchers.

- 47 research ideas for Program/Project Development, 50 for Delivery/Operations, six for Multi-Modal and eight for Planning/Finance.

To ensure that those projects ultimately selected for funding address MDOT's most pressing needs, the RACs met in early March to prioritize all of the research ideas. The REC then selected the top 33 ideas. A subset will be further developed at the May 10 Summit.

### Stakeholder Collaboration at the Summit

The Summit brings together representatives from MDOT, universities and consulting companies for collaborative discussions about the challenges facing Michigan transportation and the innovative approaches of researchers for addressing those challenges. Participants at the Summit will discuss 28 of the 33 priority research ideas, and this input will be available to MDOT project managers as they draft problem statements for the new projects.

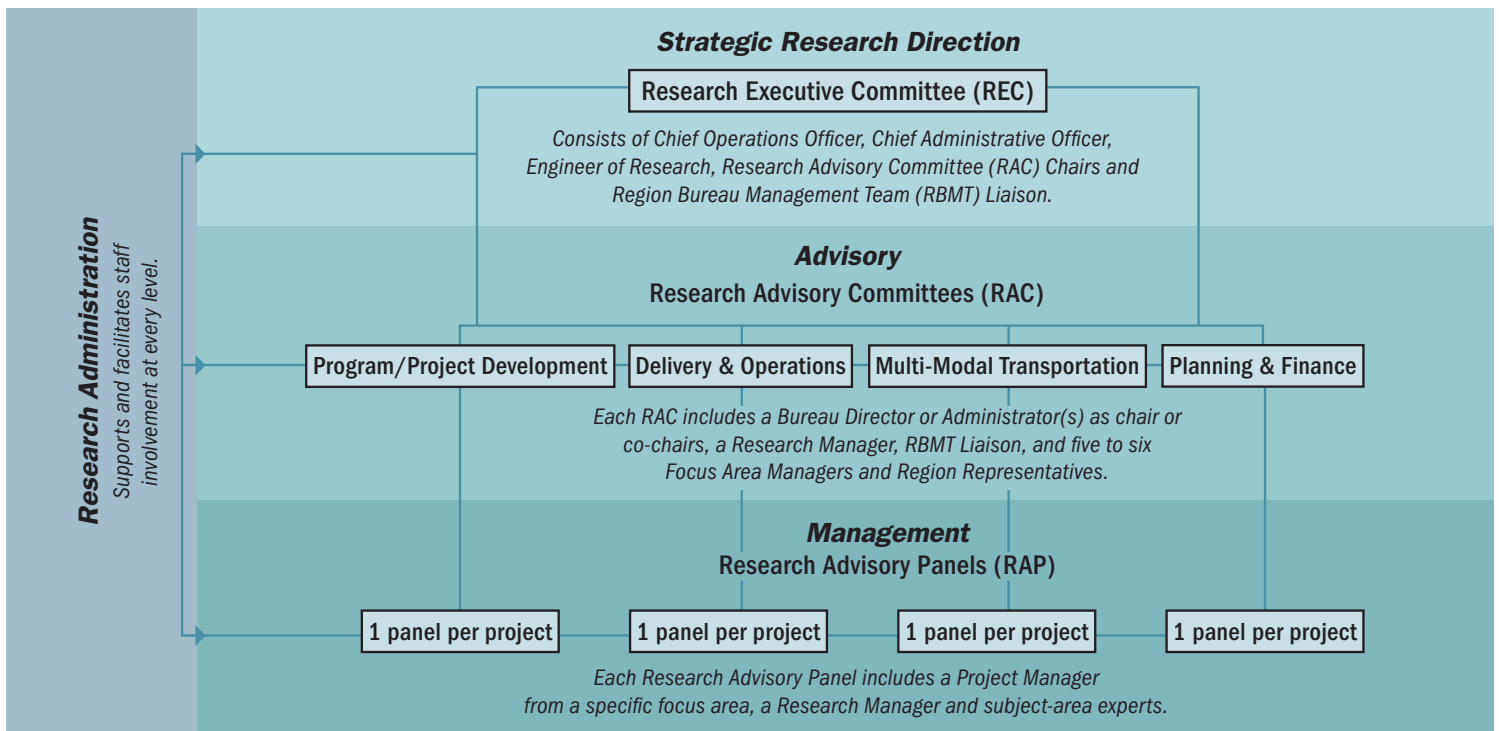
Later this year, the REC will review and approve all problem statements, which then will be used to solicit proposals from interested research teams in January 2013. Research projects will get under way in either October 2014 or October 2015.

See page 4 for a list of the 33 priority research ideas selected for funding in the 2014-2015 program.

# Effective Research Management

*Working together to advance Michigan transportation*

The Research Administration Section manages research within MDOT. This includes research funded with SPR, Part II federal research dollars and state-funded research. Federally funded pooled fund research is also managed by the Research Administration Section. To most effectively carry out this responsibility, Research Administration has developed a tiered approach to identifying, prioritizing and managing research. This process ensures that department executives provide the strategic direction for research, while engaging managers and subject-area experts in the development and refinement of research ideas and problem statements. A tiered approach also involves focus area managers and subject-area experts in the management of specific research projects, which maintains alignment with strategic research priorities. Below is a listing of key staff and their responsibilities in this process.



## Strategic Direction

The REC identifies strategic priorities for the biennial research program, prioritizes research ideas, approves problem statements, approves research projects and reviews research findings for implementation opportunities. The REC sets the tone for effective research management throughout MDOT.

## Advisory

RACs prioritize and recommend specific research ideas for REC consideration. RACs also help develop problem statements and project recommendations.

RAC members include Focus Area Managers (FAMs) who are key in all aspects of research program development and implementation. They lay the foundation for implementation by outlining the expected outcomes and benefits, ensuring a clear scope of work, and supporting strong project managers. FAMS work closely with region representatives in the Development and Delivery RACs to ensure alignment with strategic research priorities.

## Management

Research Advisory Panels (RAPs) manage the nitty gritty details of funded research projects, from vendor selection to progress reporting to deliverable review and approval. RAPs ensure that the projects run smoothly, meet the needs identified by the RACs and the REC and produce results that MDOT can consider for implementation. RAP membership typically consists of five to seven subject-area experts. The project manager for a RAP is either a FAM or a designee of the FAM.

# Developing Research Projects for 2014 and 2015

## *Steps for putting research to work for you*

What information do you need to do your job better? What problems do you need solved? MDOT's Research Administration is here to help. Below are the steps involved in requesting and carrying out a research project. You are not alone in this process. Research Administration will guide and support you every step of the way. In addition, Research Administration has established a committee structure to guide and manage the entire process. You'll have plenty of help from other staff and managers throughout the life of the project.

Steps in the research process	When
<b>1) Submit a research idea</b> Anyone may submit a research idea. Use the form to briefly explain what issues or challenges need to be addressed through research.	January 2012
<b>2) Attend the Research Summit</b> Discuss your research idea (if it gets selected for funding) with MDOT staff and external researchers at the Summit.	May 2012
<b>3) Submit a problem statement</b> The MDOT staff person assigned to the project (project manager) creates a problem statement for the research idea using input from the Summit discussions. The problem statement tells potential researchers what MDOT needs to learn from the research and how the results will be used.	May to June 2012
<b>4) Solicit proposals from researchers</b> MDOT invites researchers to submit proposals for carrying out the research described in the problem statement.	January to February 2013 or 2014
<b>5) Review research proposals</b> MDOT panel members score the proposals submitted by researchers in response to the Request for Proposal.	March to April 2013 or 2014
<b>6) Contract with the selected researcher</b> The MDOT project manager works with Research Administration to get a contract in place.	October 2013 or 2014
<b>7) Guide the research project</b> The project's Research Advisory Panel oversees project progress, reviews deliverables and responds to researcher questions.	October 2013 or 2014 to end of project
<b>8) Put the results into practice</b> MDOT staff use the research results to improve transportation in Michigan, initiate specification or policy changes, share effective new practices or determine what additional research is needed.	As soon as possible

Contact Research Administration today to put research to work for you.

(517) 241-2780

[mdot-research@michigan.gov](mailto:mdot-research@michigan.gov)

# Approved Research Ideas for 2014-2015

The following research ideas have been approved for funding. Most will be discussed at the May 10 Summit.

## Development

- Developing Performance-Based Lighting Standards.
- Evaluation and Standardization of Bridges Built Using Accelerated Bridge Construction and Prefabricated Bridge Element Systems.
- Development, Characterization and Applications of a Non-Proprietary Ultra High-Performance Concrete for Highway Bridges.
- Wireless Electronic Display of Bridge Management Data and Wireless Electronic Data Entry of Bridge Inspection Information in the Field.
- The Use of Pontis in the Network Analysis of Big Bridge Decks.
- Examination of Michigan Legal Loads.
- Long-Term Load Carrying Capacity of Carbon-Fiber Reinforced Polymer Prestressing Strands.
- Development of Wireless, Real-Time, River Flood Event and Bridge Scour Monitoring.
- Association of Michigan's Older Driver Crashes with Roadway Features.

- Evaluation of Michigan's Engineering Improvements for Older Drivers.
- Michigan Rural Safety Performance Function Development and Support.
- Michigan Urban Safety Performance Function Development and Support.
- Michigan Local Agency Safety Performance Function Development and Support.
- Evaluation of Non-Freeway Rumble Strips.
- Evaluation of Pavement Marking Practices in Michigan.
- Effectiveness of In-Street Signs at Gateway Treatment at Multi-Lane Crossings.

## Delivery/Operations

- Evaluating the Use of Tow Plows.
- Use of Recycled Concrete Fines for Subgrade Stabilization.
- Alternative Materials in Pavement Design, Construction and Performance.
- Long-Term Performance Evaluation of Subgrade Stabilization with Recycled Materials.
- Adequacy of Michigan Climatic Files for Mechanistic Pavement Design.

- Optimization Strategy for Highway Work Zone Mobility and Life-Cycle Cost.
- Evaluating Costs of Mobility Investments.
- Commercial Vehicle Enforcement Strategies.
- Assessing Mobility Impacts of Modeled Signal Timing Optimizations.
- Cost and Benefits of MDOT ITS Deployments.
- Effective Links Between Safety and Health Programs and Worker's Compensation Programs.
- Performance Measurers for Highway Winter Maintenance Operations.

## Multi-Modal

- Evaluating Methods and Counting Aircraft Operations at Non-Towered Airports.
- Developing a Statewide Transit Mobility Measurement Tool.
- Use of Contractors in Transit Vehicle Specifications.

## Planning/Finance

- Maintaining Transportation Programs in a Time of Financial Uncertainty.
- Economic Benefits of Bus Rapid Transit.

## New 2013 State Research Projects

MDOT currently has 32 active research projects. The additional nine projects listed below are expected to get under way by November 2012.

Category	Project Number	Title	Total Budget*	Completion Date
Design	OR12-014	Roadside Corridor Planning	Tier II	6/30/13
Maintenance	OR10-030	Monitoring Highway Assets with Remote Technology	Tier III	1/31/14
Traffic & Safety	OR10-035	Development of Performance Measures for Non-Motorized Dynamics	Tier II	9/30/13
Geotechnical	OR10-047	Freezing and Thawing of Frost-Susceptible Soils - Development of a Reliable Predictive Model	Tier I	9/30/14
Structures	OR10-038	Evaluating Prestressing Strands and Post-Tensioning Cable in Concrete Structures Using Nondestructive Evaluation (NDE) Methods, including Joint Shear Wave Analysis	Tier II	9/30/14
Structures	OR10-042	Side-by-Side Probability for Bridge Design and Analysis	Tier II	12/15/13
Structures	OR10-043	Evaluation of Bridge Decks using Non-Destructive Evaluation (NDE) at Near-Highway Speeds for Effective Asset Management	Tier II	9/30/14
Structures	OR10-041	Remote Monitoring of Fatigue Sensitive Details on Bridges	Tier II	9/30/14
Structures	OR10-039	Design and Construction Guidelines for Strengthening Bridges Using Fiber Reinforced Polymers (FRP)	Tier II	9/30/14

\* Tier I = \$25,000-\$99,999; Tier II - \$100,000-\$250,000; Tier III - >\$250,000