

# RESEARCH UPDATE

JULY 2013

## MDOT Leads and Learns at the TRB Annual Meeting

Every January, MDOT sends a team of representatives to the Transportation Research Board (TRB) Annual Meeting to share outstanding research and practices developed within Michigan and to learn from other transportation professionals around the world. This year's theme was "Deployment of Research Results," echoing MDOT's own strong focus on bringing innovation into the state.

Nearly 30 MDOT personnel representing both operations and administration attended this year's conference. Eight staff gave presentations on successful MDOT practices and initiatives, such as automated vehicles and e-construction. In addition, the results of seven MDOT-funded research projects were shared, with topics ranging from bridge deck degradation models to the value of public rest areas.

See pages 7 and 8 for details on MDOT's leadership and participation at TRB.

Research Administration (RA) coordinated MDOT attendance at the TRB sessions and committee meetings to maximize knowledge gain from the conference. After the meeting, attendees reported to RA those innovative ideas that warrant follow-up action from MDOT. "We are cataloging these takeaways for future tracking," said Engineer of Research Steve Bower. "We want to be systematic about implementing research results."

This newsletter features several of the key practices shared by MDOT at TRB or reported as takeaways by attendees. For more information about the promising practices identified at TRB, contact Steve Bower at [bowers@michigan.gov](mailto:bowers@michigan.gov).

## New Report on MDOT Innovations



*FHWA's Every Day Counts innovations are among those being tracked by RA for successful deployment within MDOT.*

Research Administration is developing a new Innovations Report to track and share actions taken within MDOT to implement state and national research results and best practices. The goals are to inform staff and managers about existing efforts to change and improve practices and to highlight opportunities for additional support and involvement.

The report will track the implementation of MDOT-funded research projects, takeaways from the TRB meeting, best practices, and pavement demonstration projects. It will be updated annually to include the latest actions taken to move each innovation forward within the agency.

Find the report online at [www.michigan.gov/mdotresearch](http://www.michigan.gov/mdotresearch) later this summer.

### In This Issue

MDOT Leads and Learns at the TRB Annual Meeting	1	Real-Time Data in Transportation Decision-Making	5
New Report on MDOT Innovations	1	National Recognition for MDOT Rumble Strips Research	6
MDOT Exceeds Goals for Accelerated Bridge Construction	2	Automation Streamlines STIP Process	6
Digital Tools Mean Greater Productivity and Transparency	3	TRB Committee Addresses DBE Issues	6
MDOT Takes Next Steps with New Lighting Technologies	3	MDOT Leadership on TRB Committees and Project Panels	7
Improving Efficiency by Focusing on Output	4	MDOT Presenters at TRB	8
		MDOT-Funded Research Featured at TRB	8

# MDOT Exceeds Goals for Accelerated Bridge Construction

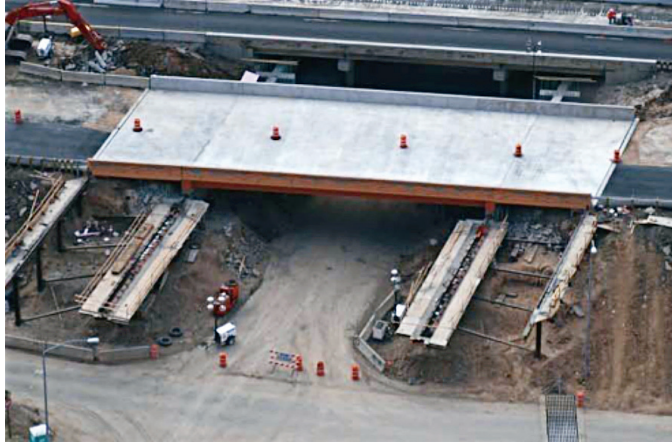
Through its Every Day Counts initiative, the Federal Highway Administration (FHWA) promotes accelerated bridge construction (ABC) as a way for DOTs to shorten the time needed to complete highway projects. MDOT staff described how Michigan has made strides in meeting and exceeding FHWA's goals for implementing ABC.

"One type of ABC involves prefabricated bridge elements and systems, or PBES," MDOT Bridge Development Engineer Dave Juntunen explains. This is where individual concrete bridge elements are fabricated off-site—cast and allowed to cure over a month's time—without causing user delays typical with cast-in-place construction.

Juntunen pointed to more than half a dozen MDOT bridge rehabilitation projects that have used a range of precast parts: pier columns, pier caps, abutment walls, full-depth deck panels and box beams. "PBES is rapidly becoming a go-to tool in our toolbox," he says.

The latest phase of FHWA's Every Day Counts initiative also promotes the more involved ABC process of slide-in bridge construction. With this technique, an entire span is built on temporary supports parallel to an existing bridge slated for replacement. When the new bridge is completed, the roadway is closed for a short time to demolish the old bridge, slide the new one in place, and tie the new bridge to the existing approaches.

"We're very excited about this technology," Juntunen says. Three full bridge replacements using the slide-in technique are planned for MDOT's 2014 construction season, two in the Grand



MDOT is planning its first three slide-in bridge replacement projects—similar to this one in Kentucky—for construction in 2014. (Image courtesy of Kentucky Transportation Cabinet)

Region (on M-50 over I-96 and on US-131 over 3 Mile Road) and one in the University Region (on M-100 near Potterville).

MDOT's success with ABC can be attributed in part to concerted policy efforts to meet the goals the department established with FHWA. "We wrote into our call for projects that every rehabilitation project must at least consider ABC to see if it would be viable and beneficial," Juntunen says. "As a result, we shattered our initial goal of having 25 percent of rehabilitation projects include ABC." ABC has been proposed for more than half of MDOT's major bridge rehabilitation projects for the 2014 construction season, including three slide-in bridge construction projects and 15 prefabricated element projects.

MDOT shared its program successes with other state DOTs at this year's TRB meeting. MDOT Engineer of Bridge Field Services Matt Chynoweth presented at a session focused on ABC policy development. (Find papers and presentations at <http://amonline.trb.org>, Session 561.) "There was a common theme that well-informed motorists are willing to pay more when a tool can considerably shorten construction delays," Chynoweth says. "For example, the public in Utah is very knowl-

edgeable about ABC, and a survey there showed 91 percent of people would pay extra for ABC." The reduction of user impact makes a compelling case for MDOT, too. "Construction delay costs are tangible," Chynoweth says. "They include vehicle wear and tear, lost economic opportunity, and environmental impacts. ABC can make a big difference."

At TRB, Chynoweth also learned about the ABC scoring systems and decision-making flow charts used by other DOTs. "Their methods are in line with an Excel-based tool that Western Michigan University is developing for MDOT," Chynoweth says. "MDOT's Accelerated Bridge Construction Decision tool will consider several factors for objective decision-making on where and how to best use ABC."

As deployment of ABC continues to expand in Michigan, MDOT is working to integrate ABC into its standard practices. The department has already developed a chapter on ABC for its Project Scoping Manual and drafted changes to the Bridge Design Manual. MDOT also is developing detailed project-specific provisions to determine how to carry out the bridge slide for each project that will use the slide-in technique. "A lot of people at MDOT are putting in the extra effort to help us take these major next steps with ABC," Chynoweth says.



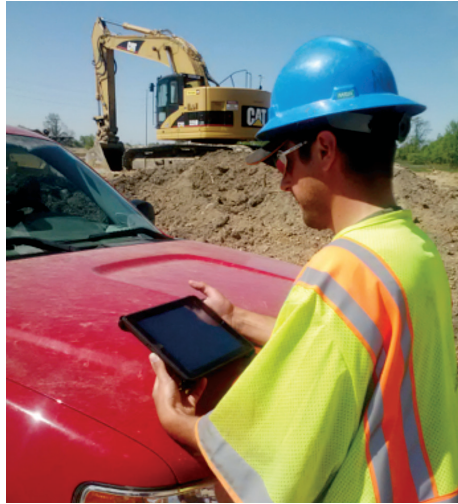
Iowa DOT presented alongside MDOT at the TRB meeting and shared another perspective on ABC policy and deployment. (Image courtesy of Iowa DOT)



# Digital Tools Mean Greater Productivity and Transparency

Improved digital tools—from advanced design software to wireless devices in the field—continue to help DOTs design and deliver major projects. At this year’s TRB meeting, MDOT Design Services Manager Dan Belcher checked in on other states’ progress in implementing Virtual Design and Construction, or VDC. (For papers and presentations, see <http://amonline.trb.org>, Sessions 693 and 738.) “We’re keeping pace with other leaders in VDC,” Belcher says. MDOT uses GEOPAK, a civil engineering software package that allows for design of road features as three-dimensional solids. “I think we’re going to be among the first states to move to the latest release of the software for our major road construction and rehabilitation projects,” Belcher says.

Belcher explained the significant benefits of VDC. “In the past, we designed by cross sections every 50 feet, leaving con-



*Wireless tablets on MDOT job sites will help make paperless contracting possible.*

struction staff room for interpretation in between,” he says. “Now, VDC lets us design 100 percent of a project. By addressing all project features in the design stage with 3-D modeling, we can identify and solve potential issues.”

MDOT is also pioneering the use of digital tools for all phases of the survey, design and construction business process. “These tools allow MDOT to pilot paperless construction contracts,” says Engineer of Field Automation Cliff Farr. “It may be that we’re the first DOT to combine all these tools to do that.” Wirelessly connected tablets in the field help make it possible. “Documentation is being delivered electronically and shared in one common data location,” Farr says. “That means MDOT, FHWA, contractors and consultants can all access current project data from any location, remote or otherwise.

“The process not only improves transparency,” Farr continues, “but has the potential to drastically improve efficiencies at multiple levels.” In 2013, fully \$125 million in projects are being piloted. MDOT will assess the pilot results as plans are made to move toward complete implementation in the future.

## MDOT Takes Next Steps with New Lighting Technologies

Promising alternatives to traditional high-pressure sodium (HPS) lamps for roadways have emerged in recent years. Technologies like light-emitting diodes (LEDs), light-emitting plasmas, inductives/fluorescents and metal halides offer various benefits compared with HPS lamps. These can include reduced energy consumption, lower maintenance or life cycle costs, and spectral output better suited for use by motorists and pedestrians.

Like other transportation agencies across the nation, MDOT has begun installing these next-generation roadway lights, including LED luminaires—a common choice among DOTs—on selected state highways. However, as MDOT Engineer of Research Steve Bower explains, deciding whether and how to transition to LED lighting is not a simple matter. “As with any new tech-

nology,” Bower says, “the department has to address some important issues with LEDs and other new types of lamps.”

He noted two questions of primary concern to MDOT: First, what are the design requirements for producing equivalent levels of usable light compared with HPS lamps? And second, from a dollars-and-cents perspective, what are the life cycle costs of these new technologies? That means taking into account installation costs, long-term energy and maintenance costs, and replacement costs.

These issues must be addressed for MDOT to develop standard practices and



*Differences in the color temperatures of traditional high-pressure sodium lamps (yellow/top) and LEDs (blue/bottom) stand out on an I-275 interchange west of Detroit.*

justify investments. However, these research questions come at a challenging time for MDOT, coinciding with the retirements of several lighting experts in the department.

## MDOT Takes Next Steps with New Lighting Technologies *continued*

Fortunately, other states are tackling many of the same research challenges, and MDOT is a beneficiary of the keen interest in alternative lighting technologies. Not long ago, Mark Van Port Fleet, director of the Bureau of Highway Development, scoped a possible research project on this topic, and the department learned about a relevant effort under way by New York State DOT. MDOT opened a dialogue with the principal investigator, John Bullough at Rensselaer Polytechnic Institute's Lighting Research Center. Bullough presented his research results at this year's TRB meeting. "The resulting publication, 'New Lighting Technologies and Roadway Lighting,' is a step in the direction we need to go," Bower says.

At the same TRB session (find papers and presentations at <http://amonline.trb.org>, Session 371), Bower also learned more about a multiphase research effort

that Illinois DOT is funding at the University of Illinois at Urbana-Champaign. The first phase studied illuminance—light incidence on the pavement—from different manufacturers' LEDs. That research data and methodology will help MDOT determine equivalency designs for a variety of lighting hardware. The next phase of the research, now in progress, will develop detailed life cycle cost analysis and LED luminaire specifications—both items of particular interest to MDOT.

As MDOT continues its efforts toward developing specifications, the department has a wealth of national knowledge and experience to draw from. "I'm confident we won't be reinventing the wheel as we develop performance-based standards that would support new project delivery options for roadway lighting," Bower says. Methods could include design-build contracting, public-private partnerships and

alternative bidding, where different lighting technology options could be considered for a given project.

Beyond topics of specific interest to MDOT, Bower sees additional opportunities for collaborative national research on roadway lighting. "One issue common to every state is the need for updated AASHTO guidance on this topic," Bower says. He explained that the AASHTO Roadway Lighting Design Guide, published in 2005, only addresses traditional high-pressure sodium lights. The design standards—such as those for tower spacing and height, or for lighting levels—all need to be updated for LEDs and other new kinds of lights. "Every state uses the AASHTO guide," he says. "A pooled fund research study could help answer these questions for everyone."

## Improving Efficiency by Focusing on Output



The public cares about results. While service providers may focus primarily on the procedures needed to provide a service, the public is interested in whether they're getting the level of service they need and expect. A Performance Based Operational System (PBOS) approach is a proven method that can increase effectiveness by specifying the end results of a process rather than the methods used to achieve them. The goal is that all aspects of infrastructure delivery are aligned, accountable, achieved consistently, and continuously improved with quality management.

"About one and a half years ago, we started exploring what's happening in other states and countries and found that PBOS was generally successful in in-

creasing efficiency," says Mark Geib, engineer of the Operations Field Services Division.

MDOT has experimented with PBOS on a limited scale. The maintenance of the statewide Intelligent Transportation Systems infrastructure is managed through an outcome-based contract, with generally positive results. "You have to prescribe a specific outcome, and that's the trick, so when you do that right you're set," Geib says.

Michigan has committed to implementing PBOS more broadly, and has retained a consultant to help implement the approach on a statewide basis. Recommendations from the consultant are likely to be ready for implementation in the fall.

Provisions in the federal Moving Ahead for Progress in the 21st Century (MAP-21) legislation integrate performance management requirements into many federal transportation programs. As a result, many sessions and discussions at TRB addressed PBOS in some way.

Metro Region Engineer Tony Kratofil

attended TRB and reported on several noteworthy PBOS practices:

- A paper from Virginia DOT proposes a survey of the gap between service and expectation as a measure of public perception. A recent major study from Minnesota DOT that connects transportation to quality of life can also serve as a model for quantifying results that are largely qualitative in nature.
- Florida DOT has a strong maintenance program, in part because performance standards are similar whether work is done by FDOT employees or contractors.
- New York State DOT's asset management organizational model and investment decision process warrants examination. Instead of looking just at a road's maintenance needs, the state will evaluate planning, design and maintenance needs for a road at the same time and make investments accordingly.

For more information, see the papers and presentations at <http://amonline.trb.org> (Session 362).



# Real-Time Data in Transportation Decision-Making

Intelligent Transportation Systems (ITS) use advanced data and communications technologies to facilitate enhanced transportation services. Michigan is a leader in using ITS to improve service and safety on the state's roadways.

- Three transportation operations centers in the state collect information from cameras and detectors on vehicle speed and volume. "Operators can use ITS to detect where incidents are in real time and dispatch the proper response vehicles to the correct area," says Collin Castle, connected vehicle technical manager.
- The state's Road Weather Information System, a series of environmental sensor stations in northern Michigan and the Upper Peninsula, measures atmospheric and road surface conditions. This information helps MDOT better manage winter maintenance activities and provide more reliable traveler information to motorists.
- In collaboration with the University of Michigan Transportation Research Institute, U.S. DOT has launched the Safety Pilot Model Deployment in Ann Arbor with approximately 3,000 connected vehicles. The vehicles collect and communicate data, sharing information from car to car as well as with the infrastructure. MDOT is examining the types of data these vehicles are collecting and developing applications for their use. For example, the department currently uses a single specialized profilometry van to measure pavement roughness on roads across the state. If it proves possible for connected vehicles with accelerometers to take this measurement, a fleet of hundreds of connected vehicles could collect this data on the roads far more regularly for trending purposes.
- The state of Michigan is considering the possibility of autonomous vehicles—vehicles that use advanced technologies such as sensors, cameras, radar and 3-D maps to self-navigate



MDOT is piloting a truck parking information and management system (TPIMS) on I-94. The system will alert drivers to available truck parking spots through a variety of electronic systems and signs.

and pilot without human intervention. Legislation permitting on-road testing has been proposed.

Castle presented at TRB regarding MDOT's perspective on automated vehicle regulations, and discussed the department's automated vehicle feasibility study completed by the Center for Automotive Research. He addressed MDOT's potential role in providing the proper striping, signing, signals and other infrastructure autonomous vehicles need to operate.

At the Trucking Industry Research Committee meeting, Castle discussed a pilot truck parking information and management system (TPIMS) that MDOT is designing and constructing this year on I-94 in southwest Michigan.

"What we find is that there is a lot of overcrowding, and that trucks often make unsafe parking decisions," Castle says. "It's not that there's not enough parking. Truckers just don't have enough information to make good decisions." That lack of information can lead to dangerous activities like parking on a rest area entry ramp shoulder when there are open parking spots at a truck stop a few miles down the road.

The TPIMS will instrument rest areas and private truck stops along I-94 and

disseminate information about available truck parking spots in multiple ways, including through connected vehicle systems, a smartphone application, roadside signs and traveler information Web sites. The TPIMS will go live next year.

For Castle, one of the most interesting takeaways from the TRB meeting was other states' use of ITS in work zones. "I think MDOT is pretty mature in traditional ITS, but there's a lot of potential for improvement in work zone ITS applications," Castle says. These applications include dynamic signs that display travel times through a work zone and queue detection systems that can identify when and where queues are forming and provide appropriate warnings to drivers.

While motorists are unlikely to ever enjoy driving through work zones, this type of information can go a long way toward eliminating their negative feelings about construction. "We often find that driver frustration in work zones is not solely due to the delay, but because they don't have enough information," Castle says.

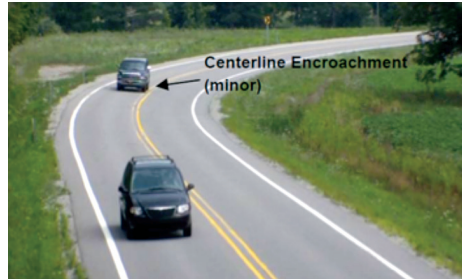
Presentations from the TRB session "Highlights from Summer Workshop on Road Vehicle Automation" are available at <http://amonline.trb.org> (Session 466).

# National Recognition for MDOT Rumble Strips Research

For the second year in a row, one of MDOT's research projects has received national recognition. The AASHTO Research Advisory Committee (RAC) selected MDOT's "Impacts of Non-Freeway Rumble Strips—Phase 1" as one of its "Sweet 16" for 2013 from among more than 100 projects submitted by state DOTs nationwide. Each of these high-value projects will be showcased at the RAC's annual summer meeting.

MDOT leads the country in implementing rumble strips as a safety countermeasure, and the department wanted to evaluate existing installations for safety, operation and pavement durability. Researchers from Wayne State University found that the presence of centerline rumble strips on rural high-speed non-freeway highways improves driver performance in most conditions, signaling an expected increase in safety on these roadways.

MDOT is beginning a second phase of the study to evaluate driver behavior and crashes over a three-year period. This



Researchers used pole-mounted, high-definition cameras to capture centerline encroachment.

phase will support development of guidelines for installation. "We expect Phase 2 of this project to show that centerline rumble strips significantly improve public safety as well as give transportation agencies in Michigan and other states the data they need to implement their own initiatives," says MDOT Project Manager Jill Morena.

For details on this project, see the Research Spotlight at [http://www.michigan.gov/documents/mdot/MDOT\\_Research\\_Administration\\_Non-Freeway\\_Rumble\\_Strips\\_397765\\_7.pdf](http://www.michigan.gov/documents/mdot/MDOT_Research_Administration_Non-Freeway_Rumble_Strips_397765_7.pdf).

## Automation Streamlines STIP Process

Developing Michigan's State Transportation Improvement Program (STIP) requires extensive data sharing among MDOT, local metropolitan planning organizations (MPOs), FHWA and the Federal Transit Administration (FTA). To streamline these communications and reduce data entry errors, MDOT is exploring opportunities for online entry of projects by MPOs and electronic project approval by MDOT and FHWA/FTA.

This automation is being implemented in three phases, with two phases already rolled out. MDOT recently trained the MPOs on using the Web-based system, which will synchronize seamlessly with MDOT's STIP database. The TRB meeting provided a great op-

portunity in advance of this rollout to learn from the experiences of other states in implementing similar programs.

According to Denise Jackson, administrator for MDOT's Statewide Transportation Planning Division, this move to electronic data sharing may dovetail with the agency's modernization of the MAP Project Information System (MPINS). MDOT's effort to modernize MPINS benefited from surveys and other communications with states around the country regarding their own project information system modernization efforts. As a result, the new system may include modules that support routing and approval of STIP projects, which would further streamline MDOT's automation efforts.

## TRB Committee Addresses DBE Issues



MDOT Chief Operations Officer Greg Johnson represented MDOT in January as a member of the

TRB Disadvantaged Business Enterprise (DBE) Committee (AFH80). The group met to discuss a range of issues related to improving programs and practices in support of disadvantaged, women-owned and minority-owned businesses.

Johnson reported that one of the most valuable discussions related to ensuring that DBEs are fully engaged in the range of alternative project delivery methods that are gaining popularity among DOTs. For example, the group shared effective approaches for involving DBE firms in projects contracted through design-build and construction manager/general contractor methods. The committee also discussed DBE utilization plans aimed at ensuring quality involvement of DBEs in both preconstruction and construction phases of projects. In particular, participating states shared their experiences with the barriers to DBE involvement posed by prequalification requirements.

Johnson has discussed the committee's ideas with MDOT's DBE team and plans to remain actively involved in the national DBE dialogue. "Sharing our successes and challenges is key to overcoming barriers and increasing DBE participation," he says. "Continuing to grow our DBE program is good for Michigan's economy and good for MDOT."

For more information about enhancements to the STIP system and MPINS, contact Denise Jackson at [JacksonD15@michigan.gov](mailto:JacksonD15@michigan.gov).



# MDOT Leadership on TRB Committees and Project Panels

MDOT staff play an important role in national research through their participation in TRB standing committees and task forces and their service on cooperative research program project panels overseeing individual research projects. The following individuals represent MDOT in this capacity.

## MDOT Staff on TRB Committees and Task Forces

### Steven Bower

- State Representative

### Collin Castle

- Intelligent Transportation Systems Committee, AHB15
- Challenges and Opportunities in Road Vehicle Automation Joint Subcommittee, AHB30

### Timothy Croze

- Winter Maintenance Committee, AHD65

### Rebecca Curtis

- Long-Term Bridge Performance Committee: Expert Task Group for Bridge Evaluation and Monitoring, B0122B

### Karen Faussett

- Transportation Planning Applications Committee, ADB50

### Denise Jackson

- Committee for the Making Progress Toward Transportation Goals-Planners and Programmers Using Their Toolbox: A Conference, ADA99E
- Transportation Programming and Investment Decision-Making Committee, ADA50

### Greg Johnson

- Disadvantaged Business Enterprise Committee, AFH80

### David Juntunen

- Structures Maintenance Committee, AHD30

### James Schultz

- SHRP 2 Technical Expert Task Group on the Effect of Smart Growth Policies on Travel Demand, FD035

### Balaram Singh

- Culverts and Hydraulic Structures Committee, AFF70

### Kirk Steudle

- Executive Committee, E0000

### Mark Van Port Fleet

- SHRP 2 Technical Coordinating Committee for Capacity Research, FD000 (Chair)

### Ronald Vibbert

- Transportation Asset Management National Conference Planning Committee, ABC99E

## MDOT Staff on TRB Cooperative Research Program Project Panels

### Margaret Barondess

- Quantification of Benefits and Cost Effectiveness of Context Sensitive Design and Solutions in Transportation Facilities

### Rebecca Curtis

- Condition Assessment of Bridge Post-Tensioning and Stay Cable Systems Using NDE Methods
- Evaluation of Load Rating by Load and Resistance Factor Rating

### Richard Endres

- LRFD Soil Nailing Design and Construction Specifications

### Susan Gorski

- Development of Guidelines for the Use of Simulation and Other Models in Highway Capacity Analyses

### Jeffrey Grossklaus

- Analysis of Nighttime Construction Activities and Impacts to Safety, Quality, and Productivity
- Guidelines for Verification and Validation of Crash Simulations Used in Roadside Safety Applications

### Thomas Hanf

- Improving FHWA's Traffic Noise Model (TNM) by Expanding its Acoustical Capabilities and Applications

### Peter Jansson

- Long-Term Performance of Epoxy Adhesive Anchors

### Kim Johnson

- State of Good Repair: Evaluating the Implications for Transit

### David Juntunen

- Developing Reliability-Based Bridge Inspection Practices

### Kimberly Lariviere

- Comprehensive Analysis Framework for Safety Investment Decisions

### Eileen Phifer

- Hazardous Materials Cooperative Research Program (HMCRP) Technical Oversight Panel
- Pre-Planned Recovery and Accepted Practices for Replacement of Transportation Infrastructure

### Alan Robords

- Application of LADAR in the Shape Analysis of Aggregates Used in Construction Materials

### Patricia Schriener

- Large-Scale Abutment Scour Protection

### James Schultz

- Impact of Smart Growth on Metropolitan Goods Movement

### Kristin Schuster

- Guidance for Achieving Volume Reduction of Highway Runoff in Urban Areas
- Guidance for Complying with EPA Effluent Limitation Guidelines for Construction Runoff

### Kirk Steudle

- Administration of Highway and Transportation Agencies
- Developing an Asset Management Plan for the Interstate Highway System (Chair)

### William Tansil

- Best Practices in GIS-Based Asset Management

### Louis Taylor

- LRFD Metal Loss and Service-Life Strength Reduction Factors for Metal-Reinforced Systems in Geotechnical Applications

## MDOT Presenters at TRB

**Dan Belcher** presented "Eliminating Unnecessary Information and E-Construction" (Session 156)

**Collin Castle** presented "I-94 Truck Parking Information and Management System (TPIMS) Project" (to Trucking Research Committee, AT060)

**Collin Castle** presented "Michigan Automated Vehicles" (Session 466)

**Matt Chynoweth** presented "ABC-PBES Policy Development, Michigan DOT" (Session 561)

**Denise Jackson** presented "Effective Investment Decisions through Organizational Alignment" (Session 721)

**Angie Kremer** presented "How Michigan Works with SEMCOG on TIM Planning and Coordination" (Session 370)

**Scott Ratterree** and **Sonja Scheurer** presented "Fleet Management Strategies and Fleet Performance Metrics" (Session 252)

## MDOT-Funded Research Featured at TRB

**Evaluating Traveler Preferences and Values for Public Rest Areas** (Session 208)

**Recommendations for Meeting the Transportation Needs of Michigan's Aging Population** (Session 247)

**Economic Assessment of Public Rest Areas and Traveler Information Centers on Limited-Access Freeways** (Session 298)

**Effects of Public Rest Areas on Fatigue-Related Crashes** (Session 433)

**Evaluation of Impacts of Share the Road Sign on Driver Behavior Near Bicyclists** (Session 494)

**Examination of Factors Affecting Frequency and Severity of Crashes at Rail-Grade Crossings** (Session 520)

**Project- and Network-Level Bridge Deck Degradation Models via Neural Networks Trained on Empirical Data** (Session 602)

## Find More Online

Presentations, video sessions, papers and other materials from the TRB Annual Meeting are available at <http://amonline.trb.org>. MDOT employees can access full versions of these materials for free. Register for an account using your State of Michigan e-mail address.

## Research Administration

### MISSION:

*Promoting innovative research for economic benefit and improved quality of life*

### VALUES:

*Quality, teamwork, customer orientation, integrity, pride*

## The Research Administration Team

### Executive

Steve Bower, Engineer of Research  
Linda Feldpausch, Administrative Assistant

### Project Administration

Michael Townley, Project Administration Manager  
Sarah Esquivel, Project Analyst  
Portia VanPelt, Program Analyst  
Homer Sprague, Statistician

### Program Management

André Clover, Program Manager  
Mark Polsdofer, Program Specialist

### Statistical Services

Wen-Huo Kuo, Statistician

### Library Services

Alexandra Briseno, Librarian

## Contact Us

Phone:  
517-636-4555

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

Web site:  
[www.michigan.gov/mdotresearch](http://www.michigan.gov/mdotresearch)

