

themselves. With teachers and volunteers putting the modules to work in the classroom, the program is sustainable and has been very successful so far.

Similar to TRAC in its goals, the NSTI program aims at getting kids interested in transportation. Established in 1998 by the US Department of Transportation (USDOT) and the Federal Highway Administration (FHWA), the program focuses specifically on disadvantaged and at-risk students. Running from one to four weeks in the summer, the NSTI is hosted on college campuses and includes field trips to transportation related facilities and hands-on, team based problem solving. Michigan Technological University is one participating university in Michigan, hosting NSTI through its Summer Youth Programs. MDOT International Bridge Engineers Phil Becker and Karl Hansen have been involved in the Michigan Tech NSTI program for several years in Sault St. Marie, MI. They also visit local schools and give tours of the International Bridge to visiting students. Both spoke highly of the teachers and MDOT employees who participate, saying that it's great to work with people who are so committed to improving the lives of students facing challenges. "The students," says Phil Becker, "are easily the best part. I love fielding their questions, and I hope to instill a dream to pursue a career as fulfilling as the one I've had." Karl Hansen adds, "It's a nice break from the common work day. I love interacting with the students; they aren't afraid to ask questions, and they ask for the sake of learning new things."

Both the NSTI and TRAC programs are established at a national level, with resources

being developed and distributed at a state level. MDOT TRAC Program Manager and National TRAC Advisory Committee Member Julie VanPortfliet says that both the state and national levels share the same goals, and she emphasizes the focus of making math and science fun in the classroom. Michigan's programming is somewhat unique in that it integrates both programs; NSTI program facilitators at Michigan Tech use TRAC modules to offer a fun and comprehensive summer program. Michigan Tech even offers competitive scholarships which cover the cost of attending the two-week program.

Going Beyond the Classroom

Rachelle Wiegand is a third year civil engineering student at Michigan Tech who participated in the NSTI program as a high school student. "The program definitely inspired me and showed me opportunities within transportation," she says, adding that she distinctly remembers a road design project that incorporated speed, obstacles, and politics to challenge her team. It ultimately made her more aware of the kind of work she could be doing as a civil engineer. Rachelle says that she would certainly recommend that other students become involved in the program. "The networking, learning, and living on campus for two weeks was all a great experience. I was able to network with professors before I came to college, and I got to meet people just like me who share a lot of the same interests."

For TRAC students planning to pursue civil engineering after high school, MDOT offers a unique TRAC Pipeline Internship Program. A handful of participating TRAC

states offer internships, and each operates its program independently. The MDOT TRAC Program internship is specifically for 12th grade students who have participated in at least one TRAC course during middle or high school. Students in the program spend seven weeks working alongside MDOT civil engineers, learning about the rewards and challenges of the career while gaining real-world experience. At the end of the internship, students are eligible for a \$2,500 civil engineering scholarship to one of seven participating universities. The program offers students both an income and a chance to learn about a potential career; more importantly, it provides insight and networking in the transportation industry.

Opportunities to Get Involved

The TRAC and NSTI Programs have provided teachers and transportation professionals a way to reach out to students, get them interested in transportation, and offer them the resources to pursue those careers. Tim Barron has had a great deal of success with TRAC, and has seen many students enter the transportation workforce because of it. "The students really get thinking about careers in engineering. Several have gone into careers in civil engineering." He's also seen several students participate in the internship program, and return to MDOT as co-ops during their college years. These programs aren't just educating students about existing possibilities; they are allowing transportation professionals a chance to share their experiences and love of the industry to bring a new generation into the workforce.

TRAC and NSTI are always in need of transportation professionals to provide real-world experiences and answer student questions. To get involved in a program near you, visit the Michigan TRAC website listed below to find program coordinator contact information and upcoming training sessions. You can also contact Julie Van Portfliet at VanPortflietJ@michigan.gov. ■

National NSTI program:

<http://tinyurl.com/q5ee6fm>

Michigan Tech's Summer Youth Programs:

<http://www.syp.mtu.edu/>

National TRAC Program:

<http://tinyurl.com/kxnm4kd>

Michigan TRAC Program:

<http://tinyurl.com/mlnxkyf>



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About LTAP

The Local Technical Assistance Program (LTAP) is a nationwide effort funded by the Federal Highway Administration and individual state departments of transportation. The goal of the LTAP effort is to foster a safe, efficient, and environmentally sound surface transportation system by improving skills and increasing knowledge of the transportation workforce and decision makers.

Steering Committee

The LTAP Steering Committee makes recommendations on, and evaluations of, the activities of Michigan's LTAP.

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Building Bridges and Professional Skills



Kevin Bell, Negaunee High School

The Design and Build a Bridge Challenge is part of the TRAC Program, and is held at statewide and national levels. To compete, students in teams of three design a bridge using CAD software. There are design specifications set by the TRAC Program, and teams must consider strength-to-weight ratios and other real-world factors of bridge building. After building the bridge, teams must submit a proposal to their state's Department of Transportation explaining their design and building process. The teams chosen to compete in the final competition give a presentation to a panel of judges, and the strength of each bridge is tested to determine the top three teams in each age category. The process gives participating students a chance to write a technical proposal, practice presentation skills, and meet other students with similar interests. Phil Becker has served as a judge for the competition, and was impressed by the professional behavior of the students and the quality of their presentations. "They were some of the best presentations I've seen in my career," says Becker.



Michigan's
Local Technical
Assistance Program

The Center for Technology & Training (CTT) is a part of the Department of Civil & Environmental Engineering at Michigan Technological University in Houghton, Michigan. The mission of the CTT is to develop technology and software, coordinate training and conduct research to support the agencies that manage public infrastructure. In support of this mission, the CTT houses Michigan's Local Technical Assistance Program, which is part of a national effort sponsored by the Federal Highway Administration to help local road agencies manage their roads and bridges. For more information, visit www.ctt.mtu.edu.



City of Traverse City

Repairing Potholes with Infrared Recycling

Shelley Farrey - Technical Writer
Center for Technology & Training

Potholes: they're a nightmare for every motorist and they wreak havoc on transportation agency budgets each year. With last year's harsh winter, potholes have, once again, done their fair share of damage. Year after year potholes become a drain on state and local agency budgets. According to the Michigan Department of Transportation, \$8.8 million was spent on labor, materials and equipment for pothole repairs on the Michigan state trunk line last year—and this trunk line only covers 25% of the roads in Michigan. Furthermore, additional repair costs are incurred by motorists who hit potholes. According to AAA, a driver can pay up to \$2,000 a year in vehicle repair costs caused by potholes and other road conditions.

Pothole repair is one of the most commonly performed highway maintenance operations for transportation agencies. Of the

variety of pothole repair options available, agencies most commonly use the throw-and-roll method with cold mix because of its high rate of production. This, however, is not always considered the best method for pothole repair. While many agencies use cold mixes available to them for asphalt repairs, cold mix is an expensive and short-lasting repair.

Fortunately, infrared asphalt repair has begun to emerge as a cost-effective alternative to cold patching. Infrared repair begins by

The softened asphalt is raked throughout the heating process to frame the edges of the repair area - this frame, along with any holes, is filled in with new or recycled asphalt to create a seamless repair. Finally, the area is then compacted with a roller or plate. In most cases, the area can be immediately opened to traffic. More importantly though, because of the seamless repair and the addition of asphalt, the repair lasts at least as long as the surrounding pavement.

“Our goal is to never purchase cold patch again.”

removing all dirt, debris, loose aggregate and standing water from the area. An infrared panel is then placed over the area to be repaired. This panel softens the pavement by heating it to over 300 degrees Fahrenheit.

Mark Jones, Street Superintendent for City of Traverse City, started using infrared repair in 2006, and in 2010 purchased an infrared asphalt recycler to combat road repair issues in the harsh northern winters that his city faces. Since Traverse City's local asphalt plant closes from November to May each year, City of Traverse City stockpiles virgin asphalt from various contractors for use in repairs. “By stockpiling asphalt, we are able use the infrared equipment for street repair work year-round,” said Jones.

In summer of 2014 City of Traverse City went one step further by purchasing an asphalt recycler to facilitate the addition of stockpiled asphalt to their infrared recycling projects. With this machine they can take chunks of asphalt, heat them up in the machine, then add asphalt cement (if needed); in about 30 minutes they can have a ton or more of asphalt that looks just like it came from a hot-mix asphalt plant.



City of Traverse City

City of Traverse City recently purchased an asphalt recycler (above) to compliment their infrared recycler. This ensures that material lost from potholes can be more easily replaced during the infrared recycling process.

► Continues on next page

With cost-management and environmental concerns being major concerns in transportation, infrared pothole repair tackles both of these issues. With recycling of asphalt, both cost and waste are reduced. So far this winter City of Traverse City has recycled about 33 tons of asphalt for use with the infrared machine and pothole patching. "Our goal is to never purchase cold patch again," Jones stated.

Questions about City of Traverse City's infrared recycling program can be directed to Mark Jones at mjones2@traversecitymi.gov. ■

Frost heave, a significant contributor to potholes, begins below the pavement's surface. The Minnesota Department of Transportation has an in-depth video on how frost heave causes potholes, and how to improve a pavement's subgrade or base to be resistant to frost heave. The video can be found by searching for "Frost Damage in Pavement" on Google or YouTube.



City of Traverse City

City of Traverse City saves asphalt from their construction projects; meanwhile, local contractors will contribute their extra asphalt if they don't want to haul it back from project sites. This stockpile ensures the city has plenty of asphalt for year-round use. It is readily available to be added to a recycler, heated, and then used in pothole repair or other road maintenance.

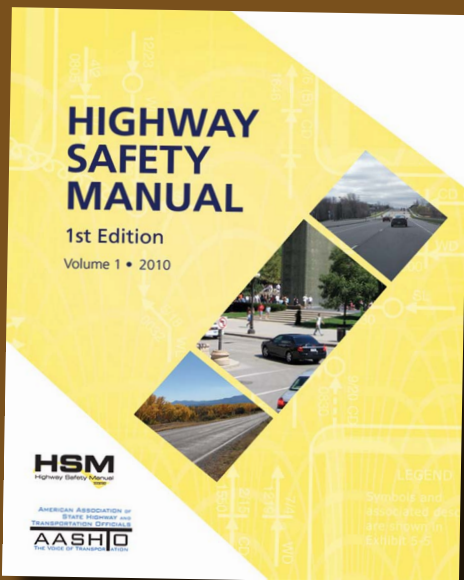
Device Shows at a Glance if Wheels are Loose

*Pam Snopl - Managing Editor
Minnesota LTAP*

Originally Published in the Fall 2014 Issue of Technology Exchange

Congratulations to Karl Hanson (Wexford) and Cynthia Redinger (Ann Arbor), who each won a drawing for printed and digital copies of the Highway Safety Manual at the recent MDOT Local Safety Peer Exchange. 42 people attended the exchange in Lansing in October.

The Bridge plans on publishing a full article on the Local Safety Peer Exchange in an upcoming issue. Stay tuned!



A wobbly wheel on a big truck is a dangerous thing. It isn't always easy, however, to see when lug nuts are coming loose. The Polk County Highway Department has put a simple plastic device on all its trucks that shows at a glance when a lug nut is loosening.

The device, formed from bright plastic that stands out visually, is a ring that fits tightly around the nut. A mechanic installs the devices so that the pointed ends form a simple pattern. A driver doing an inspection should be able to tell if a nut is loose, because the pattern will be broken.

Several companies make versions of the devices. Polk County uses an orange "loose nut indicator" available from

redoalparts.com



"Loose tires can kill," says Brad Driscoll, mechanic in the Polk County Highway Department. "We're pleased to add these devices to our fleet. It only takes about five minutes to install them per wheel. And when drivers do their morning inspection, it makes it easier and quicker to make sure the lug nuts are tight." ■

Peterbilt loose nut indicators cost less than a dollar apiece, and make it immediately apparent whether or not a tire is safely secured.



Updates to IRT and ADARS

Roger Safford, Chairman
Michigan Transportation Asset Management Council



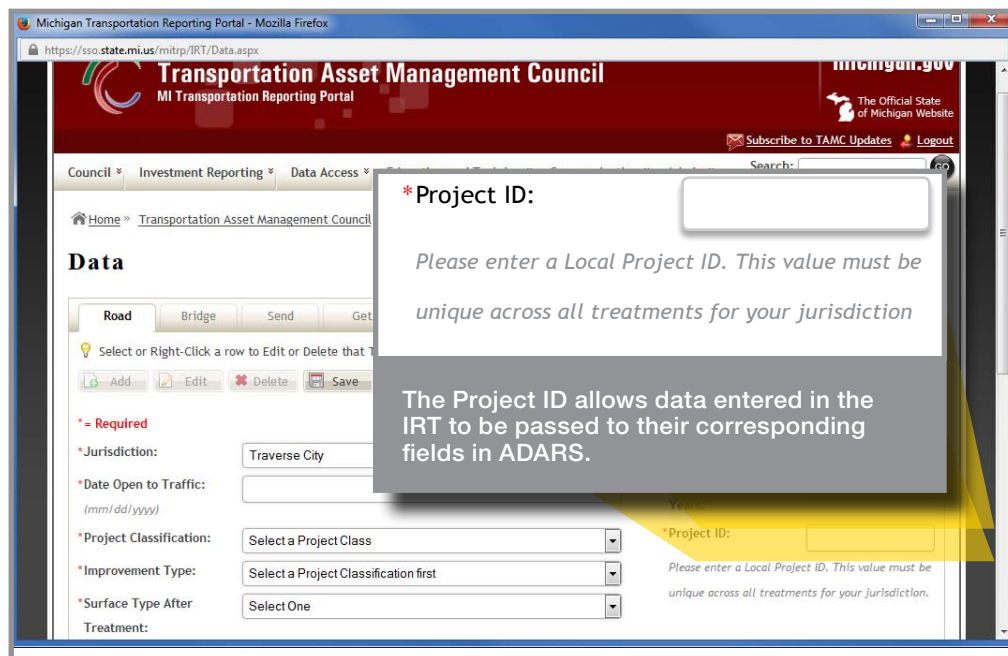
The Michigan Transportation Asset Management Council (TAMC) has made significant changes to Michigan's Act 51 Reporting Portal. Specifically, the Investment Reporting Tool (IRT) and the ACT 51 Distribution and Reporting System (ADARS) have undergone updates to improve communication and make tasks easier for transportation agencies in Michigan.

Local road agencies and the Michigan Department of Transportation use the IRT to submit annual reports for current projects and anticipated projects. Meanwhile, counties, cities, and villages use ADARS to submit annual financial reports. While the IRT and ADARS are different systems with different reporting requirements, there is overlap in which projects are reported, and the type of information reported for each. Historically though this overlapping information had to be manually entered in both systems, oftentimes by separate users. In Fall 2014, however, TAMC synced these systems to eliminate repeated entry and ensure more-consistent report data.

Project information recorded in the IRT will now be automatically transferred to ADARS. The system still begins with a user registering for the IRT through the state's web systems (<https://sso.state.mi.us>). Once the user is logged in, they enter projects, and identify them with a unique Project ID. This ID can be anything the organization's financial area uses to keep track of road improvement activities. The ID serves as a shared reference between the IRT and ADARS, so that when engineers enter information on projects in the IRT, it is pushed out to corresponding fields in ADARS. Once this information is transferred to ADARS, ADARS users can then enter financial information for the project.

Furthermore, agencies who transfer their Roadsoft data to the IRT will also benefit from the syncing of IRT and ADARS. Project data (including Project IDs) entered in Roadsoft are transferred to the IRT as they have been in the past, and are then automatically passed to ADARS.

TAMC has been working to educate users about the new process in order to gain user compliance. Over the course of this next year, there will be a soft roll-out of the program in order to create a smooth integration of the changes into the current system. This roll-out began on October 1, 2014 and will end on September 30, 2015. Following the



rollout, TAMC will expect project information requested in the IRT and ADARS to be complete. If the information is not reported, funds can be withheld until compliance is determined. For now, TAMC suggests patience and open, frequent communication between teams in order to make this process a success.

City of Traverse City is one of the first agencies to follow through with compliance on the new IRT/ADARS integration. For users such as Larry LaCross, Asset Management/GIS Analyst for City of Traverse City, the changes have been greatly beneficial to the Asset Management Team, the Engineering Department, and the Treasurer's Office. "Prior to using the updated IRT we were hesitant, but after following the directions for the system, we found the unified reporting was intuitive and easy to use." He also has some tips for those who use Roadsoft for transferring.

- When a road is opened to traffic, immediately enter that date into Roadsoft along with noting or understanding the Life Expectancy of that particular treatment.
- Practice using Roadsoft's TAMC menu and export the fiscal year treatments into a report. You can export the report to a PDF and preview it to understand what is required and gain some confidence with the process.

Mary Crane, a software engineer who has worked on the process to transfer Roadsoft data to the IRT, adds that using the Project

Builder in Roadsoft makes the data entry significantly easier. "Although road history can be entered directly in the Road Module, the Project Builder works much better for this TAMC reporting. The Project Builder ties multiple road segments together with a unique Project ID, the date and the treatment details. When you define and save a "Project", all the required details are associated with that set of road segments. The Road Module itself doesn't include all the information that is required by the IRT, so you'll end up having to enter some additional details prior to submitting the data." Mary would also like to remind Roadsoft users to update to the most recent version prior to doing their TAMC reporting so they have the latest enhancements for the process. A webinar on transferring Roadsoft data to the IRT will be hosted by the CTT in March of 2015.

For more help on using the IRT and ADARS, you can find the TAMC's schedule of upcoming training, along with several instructional documents at

www.mcgi.state.mi.us/mitrp/document.aspx?id=119

Questions about TAMC policy can be sent to Coordinator Frank Kelley at:

KelleyF@michigan.gov or 517-373-2111

Other questions can be directed to the TAMC help desk at:

CSS-TAMC@mi.gov or 517-373-7910 ■

ASSET MANAGEMENT RISK REGISTER					Risk Mitigation Strategy/Treatment
Category	Risk Event				
Use/Strategic	Funding changes	4	4	16	Monitor budget process; inform legislators
Use/Strategic	Material price changes	3	4	12	Monitor prices, prepare investment scenarios
	Lack of staff acceptance of TAM	2	5	10	Emphasize agency adoption of TAM
					Calibrate, validate model outputs
Immature Risk	Lack of staff accep...				
t/Activity	Districts' completion of preven- tive maintenance activities	3	2	6	Monitor PM program activities
					... resources for data collection

Protecting Transportation Investments with Risk-based Asset Management

This article is reprinted with permission from the Focus newsletter published by the Federal Highway Administration. It can be found at www.fhwa.dot.gov/publications/focus

A new series of reports available from the Federal Highway Administration (FHWA) examines how transportation agencies can use risk management to better protect their highway infrastructure investments, improve decision making, and demonstrate accountability.

Until recently, transportation agencies have largely used risk management at the project level during construction. Managing risks at the project level helps to identify threats to the cost, scope, and schedule, as well as opportunities to keep projects on track. However, risk management can also pay dividends at the broader program and organizational levels, particularly when

agencies face funding challenges. For example, the Washington State Department of Transportation (WSDOT) tracks and forecasts potential risks to assets. Based on the classification, age, condition, performance, and projected risk to assets, WSDOT then develops and implements reconstruction and preservation strategies. Agencies can also use risk management to prepare for and respond to such external risks as extreme weather events, climate change, and major economic downturns.

Managing risk is an integral step in following a comprehensive asset management framework, as described in the American Association of State Highway and Transportation Officials Asset Management Guide. And under the Moving Ahead for Progress in the 21st Century Act (MAP-21), states are to develop risk-based transportation asset management plans.

Transportation agencies with a process for undertaking a risk management analysis for their highway network would include identification, assessment, evaluation, and prioritization of risks that can affect the condition, effectiveness, and system performance as it relates to operation of their physical assets. Agencies would also include an approach for addressing the risks that they determine to be high priority.

“This series of reports will help transportation agencies as they develop their asset management plans and make complex infrastructure investment decisions and communicate them effectively to the public,” said Steve Gaj of FHWA.

Five reports are available in the Risk-Based Transportation Asset Management series:

- Report 1: Evaluating Threats, Capitalizing on Opportunities (Pub. No. FHWA-HIF-12-035).
- Report 2: Examining Risk-Based Approaches to Transportation Asset Management (Pub. No. FHWA-HIF-12-050).
- Report 3: Achieving Policy Objectives by Managing Risks (Pub. No. FHWA-HIF-12-054).
- Report 4: Managing Risks to Networks, Corridors, and Critical Structures (Pub. No. FHWA-HIF-13-017).
- Report 5: Building Resilience into Transportation Assets (Pub. No. FHWA-HIF-13-018).

To download all of the reports, visit

www.fhwa.dot.gov/asset/pubs.cfm?thisarea=risk

For more information on risk-based transportation asset management, contact Nastaran Saadatmand:

nastaran.saadatmand@dot.gov

or Steve Gaj:

stephen.gaj@dot.gov ■

Investing in the Future of Pavement Management

Pavement management continues to evolve as it moves from reporting pavement condition, optimizing projects, and estimating funding needs to supporting asset management practices, linking maintenance and preservation activities, and providing performance data for calibrating the Mechanistic-Empirical Pavement Design Guide models and other performance-based models.

As data collection becomes more efficient, accurate, and precise, agencies can use the better quality data to make more informed decisions. This has become even more important in the face of shrinking funding, an aging pavement network, and increased traffic demands.

These advances in pavement management are fulfilling the vision of FHWA's Pavement Management Roadmap (Pub. No. FHWA-HIF-11-011). The Roadmap outlines research and development initiatives and priorities needed by the year 2020 to address the country's pavement management needs at the project, network, and strategic levels. To learn more about completed and ongoing projects, including research into new applications of pavement management data, strategies for incorporating emerging technologies into pavement management systems, and steps to achieving more sustainable pavement management, visit FHWA's Pavement Management Roadmap Web site at

www.fhwa.dot.gov/pavement/management/roadmap

The Bridge

Bridging the gap between research and practice since 1986

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- ▶ Visually Assess Tightness of Lugnuts
- ▶ TAMC Updates for IRT and ADARS
- ▶ Risk-Based Asset Management



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Upcoming Events

Register at ctt.mtu.edu/training

2015 County Engineers Workshop

Feb 3-5 – Manistee

MERL Bid Utility Webinar

Feb 9

Constructing Pedestrian Facilities for Accessibility

Feb 10 – Okemos

Mar 10 – Okemos

Apr 14 – Okemos

MERL Local Job Manager Webinar

Feb 11

Structural Bolting Training Workshop

Feb 18 – Lansing

Mar 12 – Lansing

Highway Safety In Roadsoft

Feb 19

Presentation Skills Webinar

March 3

March 5

2015 Michigan Bridge Conference

Mar 17-18 – Bay City

PASER Training 2015

Webinars

- Feb 10 – 9:00AM-11:30AM
- Feb 12 – 1:00PM-3:30PM
- Mar 9 – 1:00PM-3:30PM
- Mar 31 – 9:00AM-11:30AM

On-site Training 8:00AM-12:00PM

(Certification Testing 1:00PM-3:00PM)

- Feb 24 – Forward Conference Center, West Branch
- Feb 25 – Horizon's Conference Center, Saginaw
- Feb 26 – Okemos Conference Center, Okemos
- Mar 24 – Crowne Plaza, Grand Rapids
- Mar 25 – Kalamazoo CRC, Kalamazoo
- Mar 26 – Henry Ford Community College, M-TEC, Dearborn
- Apr 7 – Treetops Resort, Gaylord
- Apr 8 – Delta CRC, Escanaba
- Apr 9 – Red Rock Banquet Center, Ishpeming

Registration and additional information on the sessions can be found at ctt.mtu.edu/training