



Thawcaster: Predicting Cookies-'n'-Cream-like Roads

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This year, Thawcaster, a new tool available from the CTT, can help local agencies save time in making accurate evaluations of freeze/thaw-related forecasts and data.

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Michigan's
Local Technical
Assistance Program

Ruts. Cracking in the wheel path. Alligator cracking. Edge cracking. Such common load-related distresses are more likely to occur or exacerbate during the spring thaw on roads that are not built to all-season standards.

These types of roads are subject to an Oreocookie effect, according to Wayne Schoonover, managing director of Mason County Road Commission (CRC). As weather warms, the ground thaws and softens from the top down. But, intermittent cold spells cause the top layers of ground to refreeze like the “top of [Oreo] cookies”, he notes. “Then, you’ve got the cream,” Schoonover explained, “that’s where it’s thawed out,...[and] we’ve got our hard bottom part, that’s our frost still in the ground.”

A heavy load at an inopportune time can break through that top layer into the ‘cream’, damaging the road. In many cases, however, reconstructing the road to all-season standards is not possible. Thus, reducing the vehicle loads on thaw-weakened roads can be another way of safeguarding these roads from damage. This practice is called *seasonal or spring load (or weight) restriction*.

None too Easy

To judge where and when to apply seasonal weight restrictions, many road agencies rely on a spreadsheet published in the 1987 FHWA video tutorial and report, *Guidelines for Spring Highway Use Restrictions*.¹ But, using this spreadsheet can be tedious: Schoonover remarked, “It’s a lot of data collection and there really isn’t an easy way to get the data.”

According to the *Guidelines*, roads most

susceptible to the cookies-'n'-cream-like phenomenon are thin roads, which have a surface thickness of less than two inches and a base thickness of less than six inches; but, under the Michigan’s typical seasonal circumstances, thicker roads can also be vulnerable to seasonal load-related distresses. Reducing vehicular load on these roads by anywhere between 20 to 50 percent can yield a 62 to 95 percent increase in the pavement’s service life.¹

Determining when and how long to mandate reduced vehicular loads on susceptible roads relies on two variables: the freezing index—or a measure of the “severity of winter temperatures [that consequently affects the] depth of ground freezing”—and the thawing index—or a variable that identifies the “heating effects of spring’s warmer temperatures [and their influence on the] depth of ground thawing”.¹ These two variables help agencies calculate whether load restrictions are a ‘should’ or a ‘must’.

Schoonover inputs historical weather data as well as forecast data into his agency’s version of the spreadsheet to see what it suggests for optional or necessary load restrictions. “If you want, you can literally [gather data] every single day because you’ve got your projected forecasts and your forecasts that actually happen. So, day to day, your outlook is changing.”

Automated Data Gathering

Schoonover’s fiancée—Melanie Leaver, associate dean of Instructional Technology at North Central Michigan College—wondered why data collection and calculation wasn’t a simpler pro-

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Photo: GTT Archive

► The Michigan LTAP engineers (read about LTAP's engineers in a story on page 5) collaborated with Roadsoft software engineers to create Thawcaster, an app that will help you determine the best times for freeze/thaw-related load restrictions, see page 1

Letter from the Editor

One thing constant in life is change. I remember once puzzling over a major life change and my father said that to me. I thought about it for a moment. *I think that's true,* I reflected. Many times since that day when I have faced changes, I have recalled my father's paraphrase of an ancient Greek quote and pondered how, throughout life, change does come.

The LTAP team has peculiarly pulled together this issue of *The Bridge* in middle of winter in the northernmost recesses of Michigan—a time of year when everything is constant in Michigan's Keweenaw peninsula: Everything outside the LTAP offices' windows has a thick blanket of snow. The sky is an almost-uniform, motionless deep cool grey. The Michigan Tech campus where we are located is void of people. Nothing is stirring. And, it seems as though nothing is going to change.

But, we all *know* in a week's time, change will happen, subtle as it may be for a few more grey mid-winter weeks: Students will fill the stillness of the Michigan Tech campus sidewalks, and the snowbanks will be rearranged albeit by the students sculpting the snow into colossal statues for Winter Carnival. While the statues look great for February's carnival weekend, the mid-winter sun inevitably starts to pierce the February chill, and the statues begin to shrink...slowly...and deform. And, by the time the last remnants of the statues melt into the earth, the magnolia tree in front of the LTAP offices has burst into bloom and forget-me-nots blanket the area's backwoods trails, reminding us that change has indeed come.

This mid-winter issue of *The Bridge* anticipates change. It prepares for the challenges that Michigan's road-owning agencies will face during the seasonal thaw by introducing Thawcaster. This new app promises to streamline forecast and actual weather data collection to help agencies in deciding when and where to impose seasonal load restrictions.

This issue also highlights new digital tools that play a part in improving Michigan's transportation network. The Michigan Department of Transportation's Mi Drive tool is now facilitating communication about the changing nature of road conditions across the entire state. And, the Michigan Transportation Asset Management Council has made updates to the Investment Reporting Tool in response to your feedback. As many IRT users are finding out, the latest iteration of the IRT integrates new communication tools and offers improved work flow for many smaller agencies.

In these pages, we also share stories about change. One Ingham County Road Department employee, for example, embraced change. He knew there had to be a better, more effective way to apply emulsion for sealing cracks. As a result, he changed the way his road department applies emulsion. By sharing his idea with the Michigan LTAP, he has given other agencies the opportunity to do the same. And, the Michigan LTAP has a bittersweet change to announce: its senior research engineer John Kiefer has retired. So, we share John's story—how he came to LTAP and what he plans to do in his retirement—with you. We will also introduce you to the newest members of the LTAP and CTT team who are helping us close the institutional knowledge chasm that was left upon John's retirement.

While some of the changes in life are significant and merit planning, the subtle little ones make a difference, too: In the time it took me to write this letter, the clouds are now a light cool grey backlit by fleeting rays of the mostly elusive mid-winter sun. It's a little brightness in everyone's day, even if it is only for a moment! We need to be prepared for change, big or small, because it is one thing in life that inevitably happens.

Victoria

Photo: CTT Archive, courtesy of Ingham CRD

Ingham County Road Department's Great Idea

Jessica Boelcke – Technical Writing Intern
Center for Technology & Training

The winner of this year's Great Ideas Challenge is Tom Gamez, director of operations at the Ingham County Road Department. Aiming to improve and replace the scrub seal process, Gamez developed an emulsion tail. The tail not only eliminates some of the problems related with scrub sealing but also cuts down on the number of workers needed to complete the emulsion application procedure.

An Innovative Idea

Gamez first noticed the problem with spreading emulsion when the Ingham County Road Department hired a contractor to perform a scrub seal. Currently, scrub sealing is one of the standards for applying asphalt emulsion to roads. It uses a series of brooms that are attached to a trailer pulled behind the distributor to push the emulsion into cracks in the road. As Gamez watched this process, he observed that the trailer created tire tracks in the fresh material and the brushes attached to the trailer just "scraped the emulsion off instead of pushing it downward into the cracks".

By testing different materials like push brooms and various rubber mats, he determined the right tool for scrub sealing would need to have sufficient grooving and enough weight to catch and press down the emulsion, and would need to be at least thirty inches long. Gamez explained, "The longer [the emulsion tail] the better, because it carries more [emulsion] material". After choosing a tail material, Gamez had a department

mechanic assemble the product so it could be tested on the roads. They used Telespar perforated square tubing, ridged rubber matting, steel chain, cables, a 12-volt tarp motor, and miscellaneous nuts and bolts to create the emulsion tail and in the end it took about six to eight hours to assemble. The emulsion tail proved itself very effective in improving the previous scrub seal process. With minor adjustments, the emulsion tail can also be used in many situations; for example, having several widths of tails available enables customization of the emulsion tail for spreading emulsion over an entire lane width.

Worth A Try?

The design for the emulsion tail is easy for any road department mechanic to assemble and the materials are simple to obtain. In the long run, the emulsion tail can prove a cheaper and easier alternative to the previous scrub seal process because it reduces the time and effort that crews typically spend on the process. This can save agencies money and time that could be better spent on other projects. If other agencies have questions about the specifications of the emulsion tail, Tom noted: "They're welcome to come look at the tools that we've developed".



Ingham County Road Department's emulsion tail

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Ingham CRD's Great Idea (continued from Page 3)

► The Competition

Bob White, city mechanic for the City of East Jordan, won second place in the Great Ideas Challenge with a plow that attaches to the back of a snow blower to ensure that the sidewalks are bare of any residual snow that the blower might have missed. Steve Roose, director of buildings and equipment for Kent County Road Commission (KCRC), earned honorable mention for adding a light box onto a plow's wing to simulate taillights so that motorists can see when the lane is being occupied by the wing. More details about the great ideas submitted to the 2017 competition can be found in

the Entries Booklet on the Michigan LTAP's site, michiganltap.org/GreatIdeas.

Your Chance to Spotlight Your Agency's Great Idea and Win

Does your agency have an innovative idea or technique that can benefit other agencies? Submitting your agency's innovation to the Great Ideas Challenge 2018 gives you a chance to share your idea with other agencies and win prizes. Innovations can be submitted to the contest before May 2018 using the submission form on the Michigan LTAP's website. ■



Second Place: City of East Jordan's Drag 'n' Plow



Honorable Mention: KCRC's Light Box

Photos: CTT Archives, courtesy of City of East Jordan and Kent County Road Commission

Thawcaster (continued from Page 1)

cess in our digital age. "She said, 'All that weather data's available online; why doesn't someone create an app to collect it?'" related Schoonover about a dinner conversation he had had with Leaver and Tim Colling of the Michigan Local Technical Assistance Program at the Center for Technology & Training (CTT). "So, I said, 'Tim, with the LTAP, is there something that we can do using the FHWA guidelines [and formulas] for the spring weight restrictions...[and] pulling weather data [from the Internet]?"

That conversation led to the CTT's Thawcaster project. "An undergrad student, Isabelle Sharp, did the algorithm work to get a basic functional product out the door," recalled Byrel Mitchell, a software engineer

for the CTT's Roadsoft software suite who has since been leading the development work on the Thawcaster tool.

"The forecast changes daily, so they'd have to replace all of the forecast data [in their spreadsheet] every day and look at it again," said Mitchell. Thawcaster automates the collection of forecast and current weather data. "It'll show local agencies their history, their current thawing and freezing indexes, and a forecast based on the National Weather Service data," he noted. Graphing tools in Thawcaster give users the ability of turning on the lines that depict recommendations for load restrictions. Mitchell notes that the graphing tools also allow panning, zooming, and exporting. He thinks agencies will find these tools "really useful for creating reports" and for communicating with the public.

But, Mitchell acknowledges the tool is not without its limitations. He points out that the weather data currently relies on NOAA climatological data, which is sometimes five days old. While this reduces the accuracy of predicting thaw, agencies can actually enter their own weather data to generate a more accurate prediction.

Thawcaster is also still lacking a good model for anticipating re-freeze, according to Mitchell. Consequently, Schoonover notes that they're "careful with trying to evaluate re-freeze periods" and they "try to work with [those hauling loads]". He points out that half-an-inch of re-freeze, for example, is "not a whole lot" and says that heavy

loads can easily "break through that...[and be] into the 'cream'".

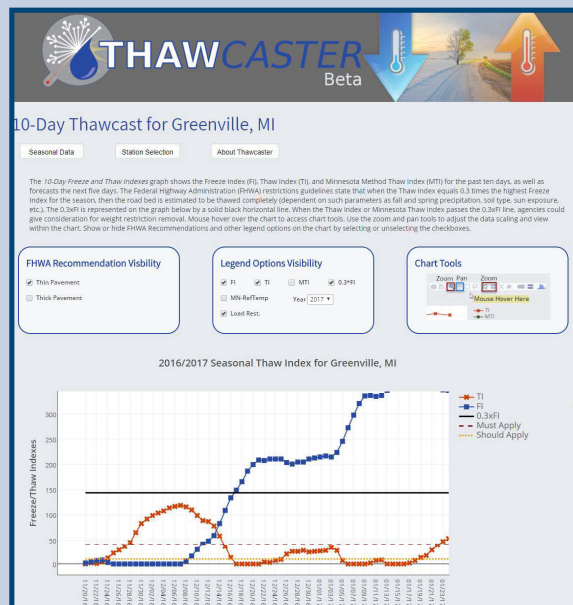
'It's not Armchair Quarterbacking'

That's why field observations still matter. "Thawcaster's not an all-inclusive black box,... [but] it's a component of the process," emphasized Schoonover. "We're not just going to use it, plug in the numbers, hey, look, there's no frost for you...We are not an armchair quarterback making a decision. There is still our field observations and our judgement."

While safety is "number one" for Schoonover, he's also faced with the "very big reality" of commerce in determining where and when to impose seasonal load restrictions. "We'll have Thawcaster data as a component of our information,...and [we'll] be able to explain that to our customers out there—whether it be the farmers or the loggers—saying 'Okay, here's what we've got, and here's what we need to do to try to protect the roadways,'" he said. For Mason CRC's operations, Thawcaster's amalgamation of freezing and thawing data and calculation of indexes makes it a time-saving tool.

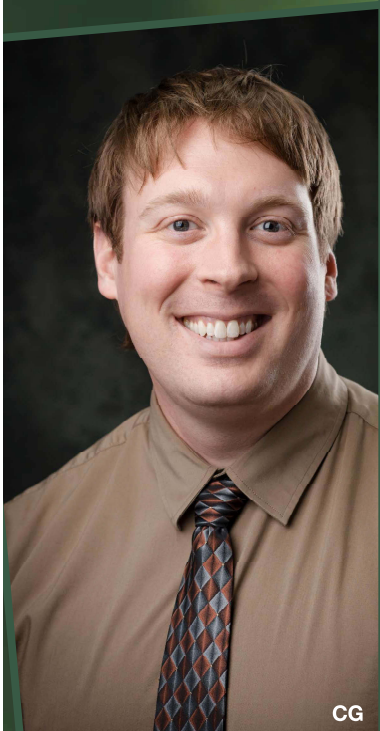
Thawcaster can be accessed from CTTportal.com. An *Introduction to Thawcaster* webinar on January 30, 2018 will show agencies how they can get the maximum benefit from using Thawcaster in their seasonal load restriction evaluation process. To register, visit ctt.mtu.edu/training. ■

1. VIDEO: https://www.youtube.com/watch?v=f5ENsE_saL0 • REPORT: Mahoney, JP, Rutherford, MS, & Hicks, RG. (1987). Guidelines for Spring Highway Use Restrictions (FHWA-TW-87-209). McLean, Virginia: U.S. Department of Transportation Federal Highway Administration.



Screenshot of the Thawcaster application showing a customized graph generated from weather data

Photos: CTT Archives



CG



Tim



Pete



Andy

LTAP's Engineers

Micaiah Grossmann – Technical Writing Intern
Center for Technology & Training

There's a bit of an elephant that's been loitering in the Michigan Local Technical Assistance Program (LTAP) office, here at the Center for Technology & Training (CTT). Not a pet pachyderm, no, but in the form of a dear team member retiring in late 2017: John Kiefer, PE.

John grew up in Manistee, Michigan, and attended Michigan Technological University to study mechanical engineering out of high school. After only three years of school, he returned to Manistee to supervise a power plant. But, ten years later, he resumed his studies at Michigan Tech, intending to finish his degree. When he returned, John began looking into alternatives to mechanical engineering. "I talked with Vern Watwood, who was the [Civil and Environmental Engineering] department head at that point," he explained, "and I decided that civil engineering sounded like a pretty interesting thing." John, a hunter and fisherman, liked how civil engineering would give him more opportunity to be outdoors than mechanical. He went on to earn a Bachelor of Science in Civil Engineering with a concentration in structures and spent



John Kiefer, PE, Michigan LTAP's research engineer II, retired in November 2017

Photo: CTT Archives

the next seventeen years working for an engineering consulting company in the Manistee/Ludington area.

About ten years ago, John joined the CTT team and has been a key player at the CTT ever since. "John was one of the first purely research engineers that we hired while I was here," reminisced CTT's director, Tim Colling, PE. "He's been a constant with all the details that change [around here] from year-to-year...so we are going to be losing a lot of experience...a lot of institutional knowledge." John worked closely with Tim, who acts as a working director, meaning he divides his time between administrative and technical expert roles. Like John, Tim also graduated from Michigan Tech, earning a bachelor's degree in Environmental Engineering and both master's and PhD degrees in Civil Engineering, and worked in consulting on an array of infrastructure-related projects before joining the CTT in a dual role of research engineer and assistant director.

John became a familiar face at many CTT conferences and training events despite preferring to work quietly behind the scenes. He conducted PASER Trainings, Bridge Con-

ferences, and County Engineers' Workshops; and, he helped to spearhead the formation and organization of the Winter Operations Conference and the Roadsoft User Conference of the United States (RUCUS). "John's been a pillar in the LTAP community: he's touched a lot of peoples' lives with the different things that he did," Tim said. He approximates that—from the annual PASER Training and Winter Operations and Bridge Conferences alone— John came into contact with around 800 people each year.

Looking back on his time with the CTT, John says that what he's enjoyed most about working here is the people. "We've grown quite a bit since I've been here...taking on more projects, hiring more people...but, really, we've always had an excellent group of people here." While his initial interest was structural engineering, John found his CTT projects moving more and more toward maintenance and operations. Despite this, he asserted: "What I do here, I've enjoyed more than any of the other jobs I've had." Upon retirement, however, John looks forward to travelling with his wife, hunting and fishing, and having time to restore cars.

Succeeding John is Andy Manty, PE, who is originally from Ishpeming and is a civil engineering graduate from Michigan Tech. Andy worked for the Wisconsin Department

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► of Transportation primarily as an area maintenance engineer. Joining the CTT means that he will be transitioning from the state level to being part of an LTAP. Andy reflected on the CTT's diverse projects, saying, "I like the LTAP's mission of advocating for Michigan's local agencies...and I'm looking forward to the trainings and the interaction with the locals." Andy is enthusiastic to "learn about the broad range of challenges that local agencies face each day [because] they're always different". During his free time, he enjoys teaming up with his brother to navigate the challenges of small business ownership.

Continuing on alongside Andy are Michigan LTAP's other civil engineers: Chris G. "CG" Gilbertson, PhD, PE, and Pete Torola, PE. CG is the associate director of the CTT. Before he was hired at the CTT, CG

volunteered as a student to help John at the Michigan Bridge Conference. "While I was the 'front man' for the conference, moderating and making sure everything stayed on time," CG said. "John was the 'man behind the curtain' organizing the conference." CG began working at the CTT in 2011 as a research engineer focusing on the Bridge Load Rating Program. He says that John has been a mentor to him, sharing feedback and guidance when needed and offering support in areas like the Bridge Load Rating Program. CG jokingly wonders whether he has to be happy about John retiring, although in seriousness he emphasized that while "[John] will certainly be missed,...he has earned his retirement, and he'll certainly enjoy his retirement." Now, CG also leads the Bridge Design System, TAMC's Bridge Asset Man-

agement projects, and recently finished an update of MDOT's Transportation and Civil Engineering (TRAC) materials. When he's not in the office, CG can be found perfecting either his woodworking craft or his photography skills; he also enjoys traveling.

As one of the CTT's research engineers, Pete conducts training, along with John and Tim, on a variety of topics including PASER, Asset Management for Elected Officials, and Gravel Roads for Local Officials; oversees the County Engineers' Workshop; and acts as a resource to Roadsoft's software engineers. He also worked with John on piloting data collection using the Inventory Based Rating System™. "John's a really knowledgeable guy," Pete commented. "His retirement is definitely a loss for our small department here." Pete worked as a construction engineer

On the other end of the phone line...

The CTT also hired a workshop coordinator and a data support & account specialist this year. Meet Cynthia and Allison, who assist with your Michigan LTAP and Roadsoft questions and concerns and will be helping at our annual events!



Photo: Pixabay

Cynthia Elder

Cynthia Elder is the CTT's workshop coordinator and has been working with the office since February. In this position, she makes sure that all of the CTT's conferences and events happen and run smoothly, doing everything from securing and working out details for venues to managing conference publications and equipment and offering customer support for registrations. Though she didn't have much previous experience with civil engineering, Cynthia was eager to begin work at the CTT. "This job is giving me the opportunity to put my event planning background into use in a different industry," she says. "I've really enjoyed learning about all of the various aspects of the CTT—both the topics covered and the people involved. But, of course, there's much more to learn!"

Cynthia earned degrees in business and mathematics from Monmouth College in Monmouth, Illinois. In her spare time, Cynthia can often be found outdoors: hiking, cross country skiing, or sailing on Portage Lake with the Onigaming Yacht Club.

for Lake County, Illinois, before joining the LTAP team at the CTT. In transitioning from being part of a local agency to becoming a resource for them, Pete says that, although his responsibilities have changed, the ultimate goal of his work has remained the same. “We’re all serving the public when it comes down to it. I’m working for the local agencies that work for the public. Outside of work, Pete can regularly be found spending time with his family, enjoying the outdoors, and perfecting his maple syrup production method.

John retired in November, after RUCUS 2017, conveniently right before deer season. The CTT staff were sad to see him leave, but happy for him and his retirement. Moving forward though, the CTT’s newest staff members are eager to meet more local agency personnel in 2018. ■



John Kiefer in his office on his last day of work, thanks to the other LTAP engineers

Photo: CTT Archives

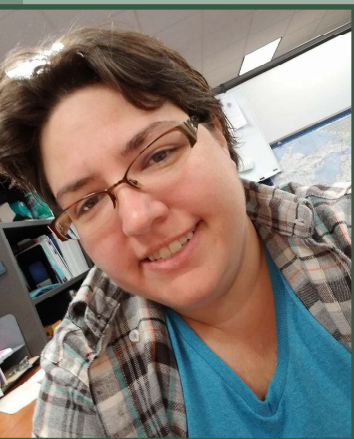
Allison Berryman



Allison Berryman grew up in Houghton and earned a degree in management from Michigan Tech. For the past three years, she’s lived in the Twin Cities area of Minnesota and worked in various management roles within Macy’s food service division. Allison’s role as the CTT’s data support and account specialist includes being one of the first contacts for Roadsoft and IT customer support as well as beginning to

organize and run some of the areas on the business and financial side of the CTT. “Trying to learn everything new—like the different lingo, what’s relevant, and what questions to ask—has been challenging,” said Allison. “But, closing cases and knowing that the caller has been taken care of and is on their way and happily using Roadsoft—that has been the most satisfying.”

Allison teaches dance twice a week and enjoys spending time out on the beach with her family, swimming and having bonfires.



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Asset Management



Achieve your goals.

PASER & IBR System™ Training

In 2018, local agencies must collect rating data on their Federal-aid-eligible roads and their unpaved roads. The Center for Technology & Training is conducting both Pavement Surface Evaluation and Rating (PASER) system and Inventory-Based Rating (IBR) System™ rater training on behalf of the Transportation Asset Management Council, which gathers statewide condition data.

PASER Training

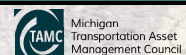
Webinar Session – no cost
February 6 | February 22 | March 8 | March 22

Classroom Session – \$10 private agency/\$20 public co. (7:30am – 12:00noon)
Feb 27–West Branch | Feb 28–Saginaw | Mar 1–Okemos
Mar 27–Grand Rapids | Mar 28–Kalamazoo | Mar 29–Dearborn
Apr 10–Gaylord | Apr 11–Escanaba | Apr 12–Ishpeming

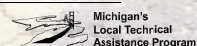
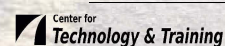
* Rater certification for eligible & registered raters, opt. 1-3 pm

IBR System™ Training

Webinar Session – no cost
February 5 | February 21 | March 7



Register at ctt.mtu.edu/training
Questions? ctt.mtu.edu or ctt@mtu.edu



Road Weather Management— Weather Savvy Roads

U.S. Federal Highway Administration—Reprinted from fhwa.dot.gov with permission

Integrating mobile observations and Pathfinder strategies can help agencies manage road systems and inform travelers ahead of, and during, adverse road weather conditions.

Heavy rain, snow, and other storms can have significant impacts on the safety, mobility, and productivity of road users. Over the last 10 years, 22 percent of all vehicle crashes were weather related. On average, these crashes resulted in nearly 6,000 deaths and more than 445,000 injuries each year. Likewise, the delays associated with adverse weather can be profound and have significant economic impacts.

In round 4 of Every Day Counts (EDC-4), this effort deploys two distinct road weather management solutions that allow state and local agencies to be proactive in managing the surface transportation system ahead of and during adverse weather events.

Pathfinder Implementation Plan

Pathfinder is a collaborative effort between the National Weather Service (NWS), state departments of transportation (DOTs), and state DOT support contractors who provide road weather information to share and translate weather forecasts into consistent transportation impact statements for the public.

The Pathfinder Implementation Plan lays out a multi-step process on what information to share when and how before, during, and after high-impact weather events. This provides the public with consistent and actionable messages on potential impacts to the transportation system.

Integrating Mobile Observations

Integrating mobile observations (IMO) involves collecting weather and road condition data from government fleet vehicles, such as snowplows. The focus is on supplemental data from ancillary sensors installed on the vehicles, such as pavement temperature sensors, and it also includes native vehicle data such as windshield wiper status and anti-lock brake or traction control system activation.

The data provides maintenance managers with an extremely detailed view of the weather and road conditions along the road network. This information supports a number of road weather management strategies, such as a winter maintenance decision support system that enables agencies to use only the necessary amounts of labor and equipment to pre-treat roads with salt and other materials. It also supports traveler advisories and warnings, ultimately resulting in improvements in safety and mobility.

Pathfinder Benefits

- **Enhanced Collaboration.** Working together to execute the Pathfinder Imple-

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mentation Plan strengthens the relationships between the NWS and DOTs.

- **Informed Travelers.** Cohesive weather impact statements enable drivers to make better decisions regarding whether, when, and where to travel.
- **Improved Safety, Mobility, and Economy.** Consistent impact messages can reduce traffic demand, with the ultimate goal of saving lives and property and minimizing the impact of weather events.

IMO Benefits

- **Cost-Efficient Operation.** Employing sensors on existing fleets is a relatively low-cost method of gathering road weather observations that can support numerous maintenance, traffic, and performance management strategies.
- **Proactive Management.** Vehicle-based technologies provide agencies with the information needed to proactively manage roadway systems before the negative

impacts of road weather occur.

- **Improved Safety, Mobility, and Economy.** Connected vehicles technologies, advanced weather prediction and targeted decision support enable operators to more effectively maintain a high level of service on roads, which decreases crashes and keeps traffic moving smoothly.

State of the Practice

Pathfinder was born out of the success surrounding the coordination between the Utah DOT and the NWS local forecast office during the 2002 Winter Olympics. The FHWA and NWS worked with the Utah DOT to document the processes, and then expanded it to be applicable across the country. The document was next used by the Nevada and Wyoming DOTs and then refined to become the Pathfinder Implementation Plan.

Most state DOTs have implemented some form of vehicle-based technology, usually for automatic vehicle location and real-time

communication. IMO builds on these capabilities by adding ancillary sensors to collect road weather data, while also tapping into the engine's "black box" to collect and disseminate resident data. The Minnesota, Michigan, and Nevada DOTs are deploying such systems, and FHWA is working with them to document the lessons learned from the implementation process as well as the management strategies (such as traveler information systems and road weather performance management systems) that these data improve. ■

Reprinted from: Federal Highway Administration. *Road Weather Management—Weather-Savvy Roads*. U.S. Department of Transportation Federal Highway Administration, January 10, 2018. Accessed: 11 Jan 2018 at https://www.fhwa.dot.gov/innovation/everydaycounts/edc_4/roadweather.cfm.

1. Excerpted from: Federal Highway Administration. *Innovation of the Month: Road Weather Management—Weather-Savvy Roads*. U.S. Department of Transportation Federal Highway Administration, March 30, 2017. Accessed: 11 Jan 2018 at <https://www.fhwa.dot.gov/innovation/everydaycounts/edcnews/20170330.cfm>.

"One agency using integrated mobile observations is the Michigan Department of Transportation (MDOT), which equipped snowplows to collect camera images of road conditions and data such as air and surface temperature, relative humidity, and brake status. This information helps maintenance workers use resources more efficiently. It's also used to post motorist advisories on the Mi Drive web site, a mobile application, and changeable message boards. MDOT surveys show that travelers changed their route or delayed their travel because of the information posted."¹

The screenshot shows the Mi Drive website interface. At the top, it says 'Mi Drive Michigan Department of Transportation'. Below that is a search bar for 'Jump to a Location' with a 'Go' button. A 'Map Legend' and 'Bridge Legend' are visible on the left. The main area is a map of Michigan with various icons representing traffic incidents. A 'Currently Applying Material' window is open on the right, showing a camera view of a road. The bottom of the screenshot features a 'Did you know?' box with a list of facts about the Mi Drive map.

Did you know?

- The Mi Drive map now offers statewide snowplow tracking information, real-time camera views, real-time color-coded speeds, and more.
- The Mi Drive map updates every 60 to 90 seconds
- Mi Drive is desktop and mobile compatible.
- Try Mi Drive: michigan.gov/drive

IRT TRAINING

The Investment Reporting Tool (IRT) is the procedure developed by the TAMC to allow public road agencies to comply with two of the reporting requirements of Act 499 of 2002 and subsequent amendments. The IRT has been available for use since 2006. Many agencies have regularly been reporting to the TAMC. The IRT has been enhanced and is now linked to the Act 51 Distribution and Reporting System (ADARS). The Act 51 is now requiring that all agencies report using the IRT.

Sailing Towards Compliance with the IRT

Data Committee

Michigan Transportation Asset Management Council

Country music legend Jimmy Dean once said, “I can’t change the direction of the wind, but I can adjust my sails to always reach my destination.” In 2002, Public Act 499 required public agencies to submit information annually on the projects undertaken during the current year as well as the projects anticipated for the upcoming three years. The legislators left it up to the responsible agencies to determine the best way to set their sails to meet that goal.

The Michigan Transportation Asset Management Council (TAMC) has developed a solution that not only helps public agencies sail their way to compliance, but also gives them a usable return on their time and effort doing so. It’s important to the members of the TAMC, who each represent a public agency that must comply with reporting requirements. And, it benefits road- and bridge-owning agencies across the state of Michigan.

That solution is the Investment Reporting Tool (IRT), a web-based interface that the TAMC uses to collect the reporting requirements. As users of the IRT themselves, the TAMC recognizes that dumping usable data into form fields and sending it off into cyberspace yields little benefit to public agencies. What they’ve given to public agencies is a tool that can work seamlessly with their existing asset management tools or provide space for a standalone agency inventory, all the while generating highly customizable map displays that agencies can use for other communication needs. Rebekkah Ausbury, a project engineer for the Road Commission of Kalamazoo County, calls the latest version of the IRT “user-friendly”.

One way the IRT shows its user-friendly design is in its compatibility with Roadsoft, the asset management tool used by many Michigan agencies for storing and analyzing

PASER data as well as road, bridge, and utilities data. That compatibility means that Roadsoft users won’t have to duplicate their data gathering efforts to achieve compliance. For them, it requires an easy export of data from Roadsoft; Roadsoft users upload the export files into the IRT, which automatically associates the data with the required IRT fields.

Some agencies don’t have the transportation infrastructure or the staff resources to warrant maintaining a Roadsoft database. These agencies, which are typically smaller communities, often make their decisions based on utilities or other factors. In the past, agencies like the City of Norton Shores stored their project data in spreadsheets. Jim Murphy, city engineer for Norton Shores, explained that “rather than using spreadsheets as we’ve done in the past, we went straight to using the IRT”. The IRT allows him to create a repository of the City’s projects along with basic georeferencing data.

Murphy has been able to build a simple inventory of the City’s projects in the IRT, complete with project-specific comments. “We started incorporating the IRT into our normal work versus [using it with the] mindset of it’s just one more thing to do,” he said. Giving users that space to view and manage their project data is one more way the IRT goes beyond a mere report-submission portal.

Tim Bock, public works superintendent for the City of Tecumseh, concurs. He explained, “The IRT was very simple and provided a means for us to record our work with comments and cost information that normally would be on paper and filed away.” He’s found it “much easier” to reference project information now that it is stored in the IRT.

The IRT also allows agencies to export reports of their IRT-stored data. Along with the map tools lauded by both Ausbury and Bock, agencies can easily access their agency-specific information for communicating with local officials or the general public. For Ausbury, the map tools allow her to “enter in projects and create customizable maps of [her] county”. Murphy calls them “invaluable” as they give him the “ability to see projects over time”. The recent improvements made to the IRT allow the map view to be customized by project type, by road/

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Screenshot of IRT’s Add Road Project options and associated georeferenced view

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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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IRT

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► bridge condition, or a combination of the two.

Users' experiences were central to the adjustments made to the IRT interface, emphasized TAMC's Data Committee. They said the redesign took into consideration suggestions from training sessions, help desk calls, and conference feedback. Delta County, for example, voiced their frustration at entering all of their required reporting data but forgetting to complete the status page; as a result, they received a letter of non-compliance and a threat of funding termination. The TAMC listened to their comment, creating a message screen that reminds users their data submission is not finished until their status is updated.

Another improvement is the IRT home page's display of background information and status, giving users a snapshot of agency's reporting. The TAMC Data Committee hopes this simple tool helps agencies 'paint' a picture of their asset inventory and reporting status for their past, current, and future projects. For Bock, these improvements are "immense".

The IRT is a necessary step in submitting required reports, but the TAMC is hoping that agencies find it a more usable and streamlined way to reach compliance. ■

Call for Papers/Sessions for 2018 ITS America Annual Meeting

The 2018 Call for Papers/Sessions is now open for the Intelligent Transportation Society of America! The deadline is March 1, 2018.

For more information, visit itsdetroit2018.org/call-for-papers.



Michigan's Local Technical Assistance Program

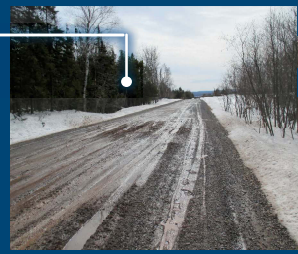
The Center for Technology & Training (CTT) is a part of the Department of Civil & Environmental Engineering at Michigan Technological University in Houghton, Michigan. The mission of the CTT is to develop technology and software, coordinate training and conduct research to support the agencies that manage 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.

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- ▶ Ingham CRD’s Great Idea
- ▶ LTAP’s Engineers
- ▶ Road Weather Management—Weather-Savvy Roads
- ▶ Sailing towards Compliance with the IRT



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2018 MDOT LAP Threatened & Endangered Species Webinar

January 24

2018 Introduction to Thawcaster

January 30

2018 Introduction to Roadsoft 2-Day Webinar

January 31 & February 1

2018 PASER System and IBR System™ Training

see page 7 for more details

2018 Constructing Pedestrian Facilities for Accessibility

February 6, March 6, April 24 — Okemos

2018 Roadsoft: Point Pavement Marking Webinar

February 6

2018 Materials Acceptance Process Seminar

January 10—Lansing, February 7—Taylor, March 8—Saginaw,
April 4—Kalamazoo

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