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The Bridge

A quarterly newsletter from Michigan's Local Technical Assistance Program

Communicating construction and maintenance projects to road users can be done easily through the navigation app Waze

Finding Your Way

How Waze Helps Agencies Communicate Road Projects

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Michigan road users are no strangers in navigating a maze of orange cones during construction season. Unlike the statewide MiDrive app that offers real-time road conditions on state highways, there is no centralized communication tool for Michigan's local agencies to communicate road conditions between county lines.

A review of local-agency websites and social media found that approximately 77 percent of Michigan's road commissions do use their own website or social media platforms like Facebook to spread the word about their upcoming projects. However, it is unlikely that road users from outside the area would check or follow agencies' websites or social media for each jurisdiction along their route.

Some local agencies have found that Waze, a travel navigation app, is an easy and effective way to communicate their road projects with road users. Waze is a "community-based traffic and navigation app that offers GPS navigation with turn-by-turn directions" (support.google.com/waze). Both Waze and Google Maps allow users to report incidents like crashes, traffic, construction and road closures. Since Google bought Waze in 2013, Google has begun implementing user reports made on Waze into its own database. By doing so, Waze reports are displayed on not just Waze, but Google Maps as well. John Abraham, director of traffic and operations for Macomb County Department of Roads, says the agency has been using Waze since 2014 or 2015. Abraham notes that a unique aspect of Waze is that it is "crowdsourced". Users can report and identify road obstructions, accidents, emergency service vehicles, and the like as long as they have an account. "The people populating the data are really drivers on the road doing their part and to keep things safe," he explained.

Waze released a new program in 2014 called "Waze for Cities", which can be used by cities and counties alike. This program is a free, two-way data exchange that allows road-owning agencies to share their construction and road closure data in exchange for Waze's real-time incident and slowdown information. This program was developed in an effort to reduce traffic congestion and improve driver awareness of road closures. "Macomb was one of the first counties who participated in the Waze for Cities Program," Abraham shared. At the time of its launch, Waze for Cities had ten partners and has since grown to have over 1,500 city, county, and state government agencies.

In Massachusetts, the Town of Barnstable was leveraging social media and their own app to communicate with their residents, but wanted a more effective way of communicating road projects. Barnstable's director of communications, Lynne Poyant, says that in January of 2022, the town was undergoing their thirty-year comprehensive wastewater management plan, which included sewering close to 50 percent of the town. Their work plan involved periodic road closures throughout the town and changes in traffic routes almost weekly. "With that level of road work comes significant disruption to traffic both on main public roadways as well as smaller, more intimate neighborhoods," pointed out Kelly Collopy, communications manager for Barnstable Department of Public

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Inside

Michigan's Local Technical Assistance Program

Letter from the Editor

A good number of my family members and friends enjoy do-it-yourself projects. In contrast, my handiness in terms of home improvement projects or car repairs is limited to "there's my tool chest; it should have what you might need". But, when one of them picks up a tool, I start with the questions, "Where are your safety glasses? Should you be wearing them?" I think my questions surprised them because of my lack of DIY know-how.

The importance of wearing safety glasses is seared into my memory after watching the compelling testimonial "Safety Glasses Save Lives" by Adam Oliver (see https://www.youtube.com/watch?v=B7tPsydaU4g) while working on our 2016 article on personal protective equipment. At the time, we had no way to integrate this anecdote into the article. So, as I sat down to write a safety piece for this issue, I was again hoping to integrate a reference to Adam's testimonial. But, while I found myself with no way to include it, we ended up with an article that we're sharing with you in this issue on safety strategies for combat complacency in the workplace.

This issue also offers insights for managing invasive plants, some of which can seriously injure maintenance workers. Other invasive plants, if not properly managed, can damage pavement and bridges.

In these pages, we take a look at protecting your information online in our second installment of how to be more cybersecure.

This issue further shares the how the Waze for Cities app can help local road-owning agencies communicate lane restrictions and road closures with the public. We also take a moment to see how past innovations were used and whether they are still in use today in our continuing series of follow ups on Great Ideas Challenge submissions.

As always, the success of our articles depends on your stories—your innovations, and your experiences. We invite you to reach out to us at ctt@mtu.edu with your engineering projects, operations and management strategies, shop products and practices, and safety resources.

Till next time, we'll be listening to you and working on articles that we hope are engaging and useful for Michigan's road-owning agencies that we serve.

Victoria


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When Road Work and Invasive Plants Meet

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Invasive plant species can quickly become not only a nuisance but a logistical issue for local road-owning agencies. Their unchecked spread can harm road workers and increase routine maintenance costs. Although they seem to be ordinarily manageable plants, invasive species can damage roads and sidewalks, block views, and cover road signs.

What impact do invasive plants have on Michigan's local road-owning agency employees and their roadwork operations? And, why is it important to have proactive management strategies?

Injury to Local Road-owning Agency Workers

Wild parsnip (Pastinaca sativa) and giant hogweed (Heracleum mantegazzianum) are two invasive species that are found in Michigan. These invasive species pose a threat to roadside workers. These invasive species have chemicals within their sap that can cause reactions like rashes or blistering burns about 36 to 72 hours after skin exposed to the sap comes in contact with sunlight. In contrast to poison ivy causing an allergic reaction when skin comes into contact with its sap, wild parsnip and giant hogweed or not as widely recognizable, which increases the likelihood of coming into contact with it, and the light-activated compounds in their sap burn the skin.

Damage to Asphalt and Concrete Pavements, Bridges, and Culverts

In addition to injury to workers, invasive species also pose a threat to pavements and roadway structures. The main species known to damage both asphalt and concrete pavements is Japanese knotweed (Fallopia japonica). As the plant grows, the structural integrity of infrastructure, such as roads and buildings, can become damaged due to pressure that is caused by the strong roots, which can grow into and exacerbate cracking in pavements and foundations. Most of the damage done by this species can be seen as eroding and cracking of road edges where the plant's extensive and strong root system can grow through small cracks in the road surface, eventually causing larger cracks and more extensive damage. Japanese knotweed is able to grow up to eight inches per day, and is known to be very prolific due its ease of reproduction as it can regenerate from fragments of rhizome, which are plant stems that grow underground or across soil surfaces, and stem node fragments. Once it is established in a location, it is very difficult to eradicate.

Non-native phragmites, otherwise known as the common reed (Phragmites australis), is another invasive species that is known to grow through asphalt and damage wooden structures such as boardwalks. Most often found in roadside ditches, this species creates monocultures that exclude native phragmites whose properties can be a benefit to roads.

Blocking of View and Road Signage

Aside from damaging road-ways and structures, Japanese knotweed and non-native phragmites can cause visibility problems for road users. Both species grow in dense monocultures with Japanese knotweed reaching 6 to 10 feet tall and non-native phragmites growing up to 20 feet tall. Japanese knotweed can also begin to encroach on roadways if left unmanaged, obstructing sight distance for drivers. These invasive species are also known to cling to and cover road signage, too. Trying to remove them from signage is an additional maintenance effort for road agencies that has associated costs.

Local road-owning agencies in Michigan have had issues with these species leading to management efforts on their behalf. For example, Berrien County has had visibility issues with Japanese knotweed and have started efforts to control the species. Additionally, in the summer of 2023, Macomb County implemented a plan to eradicate non-native phragmites along some of their roads using herbicide.

Another invasive species that can cause visibility issues is Kudzu (Pueraria montana). This is a fast growing vine species that can cover roadway signs, creep into the road, and hide other various hazards from sight as it covers them. Although Kudzu is not as prominent in Michigan as it is in the eastern and southern United States, it has been reported in Allegan, Benzie, Berrien, Cass, and Clare counties.

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Clogging of Stormwater Drainage

Some invasive species like non-native phragmites can also cause clogging of drainage structures leading to flooding and ice buildup on roadways. This species' dense root mats collect sediment and debris, blocking water flow. These blockages act as dams that slow or stop the flow of water under bridges and through culverts and other drainage structures.

Other Management Issues

When working along roadsides, some invasive species are not threats to the infrastructure but do present challenges for road maintenance crews. Examples are common (Rhamnus cathartica) and glossy buckthorn (Rhamnus frangula), which are small trees or shrubs that can grow along roadsides. Both have a woody stem and grow in dense thickets that make removal difficult. While glossy buckthorn lacks a thorn, common buckthorn does have a stiff, sharp thorn that can cause injury to workers trying to manage roadsides.

Preventing and Stopping the Spread

Michigan maintains a list of prohibited and restricted invasive species: https://www.michigan.gov/invasives/id-report/prohibitedrestricted. Additionally, there are apps that can help with invasive species identification. One example is Seek by iNaturalist, which helps identify plants through the use of smartphone cameras and can be a quick and easy way to check if you are dealing with an invasive species.

When managing roadsides that have the potential to be habitat for invasive species, the first consideration should be preventive measures if they are not already there. Oftentimes, invasive species are inadvertently spread due to management practices such as roadside mowing. Some best management practices to prevent the spread include:

1. Cleaning vehicles and equipment regularly, or before and after leaving an area with invasive species.
2. Revegetate the land with native, or non-invasive, species as they can often prevent invasives from being able to establish. Native species can also help reduce maintenance costs.
3. Identify locations where invasive species are located so that management plans can be made around these locations.
4. Work from uninfested to infested areas to lower the likelihood of spreading invasive species.
5. Work with local invasive species management groups.

Invasive plants that establish along roadsides can have long-lasting negative effects on road infrastructure, worker safety, natural ecological systems, and future maintenance costs making it important to prevent and stop the spread if possible.

Management Practices

When it's not possible to control the spread of invasive species, it is important for local road-owning agencies to catch the spread early as it is more feasible to manage and eradicate before the invasive species population grows too large.

Management options are either mechanical and chemical methods. Mechanical methods include mowing, pulling, or digging out invasive plants while chemical methods consist of herbicide applications. Once invasives are established at a site, it can be a costly mix of both management options to control the population. Understanding how each species reproduces is important to deciding what kind of management needs to be performed at a location.

Kudzu growing on road signs (Photo: Shutterstock)

For example, Japanese knotweed does not respond well to mechanical removal as its main method of reproduction happens below the ground. Just cutting it will most likely result in more spread of the species as small bits of its rhizomes, responsible for the spread, can be strewn about in the process. Instead, herbicides applied to the plant foliage can be an effective management strategy if done at the correct time, with the correct equipment, and the right herbicide selection.

Kudzu, buckthorn, and phragmites can be managed using either method or a combination of both. Localized populations of kudzu can be mechanically mowed or the bulb of the root can be dug up and removed. If mowing, it is important that it happens regularly. Herbicide application to plant foliage can be performed for larger populations of the species.

Buckthorn is managed by cutting the stem of the plant close to the ground and then either applying herbicide, or covering and securing the stem covering so that no new growth can come back. Once buckthorn has been established at a location this process can take several years before the population is eradicated. Looking for new growth is best done during the fall or early spring as they will have leaves while other native plants do not.

Phragmites can be extremely difficult to manage mechanically once they are established and have grown to size due to their height and density. That being said, mowing can be effective when the plants are small and can be kept small if mowed often enough. Once the plants have reached maturity though, herbicide application will be needed to begin managing the population. An emerging management strategy makes use of drone technology to help with mapping and herbicide application for mature phragmites populations.

A Coordinated Approach to Minimize the Spread

Invasive plant species pose significant dangers and challenges to Michigan's road maintenance operations as well as infrastructure integrity, visibility, and stormwater drainage. Effective management strategies, including early detection and coordinated eradication efforts using mechanical and chemical methods, are crucial for mitigating these ecological and logistical disruptions. By implementing proactive measures, using best practices for management, and collaborating with invasive species management groups, local road-owning agencies can minimize the spread of invasives, safeguarding both road maintenance workers and infrastructure, saving time and money on management efforts. ■

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Cybersecurity for Local Agencies

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In this five-part series, we will explore strategies that local road-owning agencies can use to be more cybersecure.

STRATEGY 2: Protect Passwords

"When I was a kid, I had the same password for everything, and it was an incredibly stupid one—simple, one word, a capital at the beginning, and the number one at the end—and it just barely satisfied security requirements," shared Alex Radke, IT and technical support specialist at the Center for Technology & Training. Without account notifications and multi-factor authentication, Radke was unaware of his password being compromised until he couldn't log into his Microsoft account. His hacked Microsoft account was not the end of his troubles: hackers were able to access his other accounts that used the same password and exploited information contained within those accounts. They signed him up for new services and used his email to send legitmate-looking messages to his contacts asking for money. "Cyberattacks are not just isolated incidents," he explained. "They're like being sick and coughing in a crowded room: one compromised system leads to another."

According to Radke, a good password protection policy for local road-owning agencies enforces password complexity, includes access to a password manager, and uses multi-factor authentication. Effective password protection policies are necessary for local road-owning agencies to protect sensitive data and infrastructure from potential cyber threats. Such a policy ensures that each person within an agency is doing their best to protect personal and organizational information.

First, a policy that enforces password complexity—through both length and types of character—can help to mitigate the chances of password compromise. Radke advises "Don't put a limit on how long the password can be: 16 characters may not be long enough." In fact, if a 16-character password consists of numbers only, it could be hacked in a matter of hours or days, according to Security.org (see https://www.security.org/how-secure-is-my-password/). Technology expert Kim Komando suggests that passwords should not only be at least 11 to 12 characters long but also a mix of numbers, upper and lower case letters, and symbols (https://www.komando.com/tips/cybersecurity/check-your-password-strength/). Longer passwords with more complex character combinations can take decades or even millions of years or more to crack. Radke concurs: "Use as many special characters—even spaces—as the system can allow."

To make complex passwords that are easy to remember, passphrases can be used. These are "three or four words of decent length related to something that are not bound to you", says Radke. A strong passphrase should not contain easily-accessible personal information, such as significant years and pet names. "Pick a couple of weird verbs, adjectives, nouns," suggested Radke. "Stitch them together, and then include whatever you need to make the password strong."

Additionally, the same password should not be used across multiple accounts, like Radke had done. If one password is used across multiple accounts, all of those accounts are compromised if the one password is discovered. "I recommend that you never repeat passwords across services," confirmed Christoforo Delreal, systems administrator for the CTT. While this may seem overwhelming, password manager software can store all of a user's usernames and passwords in an encrypted vault so that a user only need to remember the one password to access their vault. Commonly, password managers also have password or passphrase generators that help users create strong passwords. Using password managers also reduces the need to write down a password. "Do not write down any of your passwords, don't keep them in your pocket, and don't stick it under your keyboard," Radke cautioned. "They'll get lost, go through the laundry, or get found under your keyboard."

Second, a barrier against cyberattacks targeting account logins that Steve Gradowksi, IT manager at Saginaw County Road Commission, recommends is multi-factor authentication (MFA). MFA systems are electronic authentication methods that require the user to verify their identity in two or more ways before they're allowed access to an account. In other words, when a user attempts to log into an account with their username and password, the user receives a text message or email notification of the login attempt with a one-time code that needs to be entered on the login screen. As such, MFA requires access to a specific phone number or email account identified by the user. MFA systems stop "almost a hundred percent of any credential theft because, even if they get your password, the first time they try to log into something, it sends you an email or a notification," said Gradowski. It is important to note, however, that unsolicited authentication alerts and codes should be denied as they likely indicate a compromised password.

For more information visit https://www.nist.gov/blogs/cybersecurity-insights/cybersecurity-awareness-month-be-cyber-smart and https://expertinsights.com/insights/how-to-create-a-secure-password-policy-for-your-organization/. ■

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▶ Works. Poyant added, "Being that we're a tourist area, we didn't want to do this kind of construction when the visitors are here because adding construction traffic would really be problematic and we would have all of these people on social media saying 'don't go to the Town of Barnstable'." So, that's when the Town of Barnstable decided to add Waze to their communications toolbox. Collopy shared, "As a way to provide our community with as much information as possible and make commuting around town easier, we have leveraged Waze to alert our residents and visitors of expected road closures, detours, and single-lane alternating traffic patterns."

Like Barnstable, Macomb County draws visitors for its extremely-popular annual air show. In order to carry out the event safely, more than thirty different roadways must be closed. Abraham recalls getting in touch with Waze and how receptive they were to partnering with the county and assisting them with traffic control. "We now have the capacity to go into Waze maps and say a certain road is closed and the duration of the closure," shared Abraham.

Partnering with Waze was a relatively simple process. Road-owning agencies can apply to become a partner with the app or through their website (www.waze.com/wazeforcities/). After application, there is an approval period during which Waze verifies the legitimacy of the agency and accuracy of the updates provided . For the Town of Barnstable, it took about three to four months. Poyant recalled, "Once we got the authorization, our updates submitted through the Waze dashboard were instantaneous." Now, the Town of Barnstable can schedule or immediately post road closures, construction projects, and any other road-related event information through the app.

However, there is no "one size fits all" with communication. "The biggest challenge Barnstable faces in using Waze is simply user adoption," explained Collopy. Not all motorists use the app as there are other, more popular navigation options like Apple Maps. But, as more cities and counties use communications tools like Waze to post up-to-date construction activities, it is likely that wider implementation and sharing of the data will follow. The ability of platforms like Waze to provide real-time traffic information can be a valuable asset for local road-owning agencies. "We have happy residents because they feel informed," reflected Poyant. "We can update the Waze map with all our road closures, which immensely helps traffic.."

Reflecting on his agency's use of Waze, Abraham said, "Our objective is to inform the motoring public and we found a simple solution to get road closure information to the masses more efficiently." By embracing new ways of communication like Waze, road-owning agencies can strengthen their connection with their residents, creating a more efficient and overall enjoyable driving experience for the traveling public. ■

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Combatting Complacency with Safety Conversations

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Our brains are wired to become complacent. When we learn something new, the brain focuses its attention, trying to predict outcomes and identify priorities in the learning process.[1] This fires up neurons in the frontmost part of the brain. At the same time, the brain processes the rewards or goals associated with the task in a different portion, known as the striatum, which is also responsible for habit forming.[1]

Many tasks we do in the workplace become habitual for us, like operating paving or plowing equipment, checking components of vehicles like lights and tires for proper functioning, and putting on personal protective equipment. As these tasks become habitual, a deep pathway is formed between the frontmost part of the brain and the striatum.[1] This pathway allows the neurons to pass between the two parts more easily, which makes accomplishing repeated tasks increasingly effortless in terms of needing to think about it.[1]

Unfortunately, that ease comes with a downside: it is the cause of complacency. Complacency is "a feeling of contentment, self-satisfaction, or a lack of awareness about or indifference to dangers", according to risk control consultant Rick Grobart in Moran.[2] It is fueled by allowing unsafe practices or procedures until they become bad habits, overestimating one's ability to control a process or procedure (i.e., overconfidence), and overlooking the obvious, says Grobart in Moran.[2] When it comes to safety in the workplace, OSHA says "complacency kills".

Sadly, time and again, it seems that OSHA is right about complacency. For example, OSHA encourages safe trench work by saying "slope it, shore it, shield it" and safe work in confined spaces by saying"permit required" (see https://michiganltap.org/sites/michiganltap.org/files/bridge-newsletter/bridge35-1.pdf and https://www.osha.gov/confined-spaces/hazards-solutions). They so often repeat those phrases that it is easy to overlook or become indifferent to the value of these phrases and the practices to which they refer. But, these practices do save lives as Curtis Zanussi and Cody McNolty know all too well. Zanussi was 24 when he began working on a golf course construction site. During a trench operation, the trench collapsed on him. He survived, but his shatter pelvis has left him walking with crutches at 25, forever changing his life (see https://www.youtube.com/watch?v=Lupfl8q-MWo). McNolty's life was changed, too, but in a very different way. "It's a hard thing for a human to admit, but I could not save my father; I could not do it," he reflected. McNolty worked as a welder's assistant, helping his father to refit a log barge. After his father, Dan, entered a confined space and failed to re-emerge, McNolty and two other co-workers entered the confined space attempting a rescue, a risky decision considering half of all confined spaces-related deaths are untrained rescuers. McNolty and his co-workers did survive the ordeal, but his father did not (see https://www.youtube.com/watch?v=SuC4aurqkm8).

"Safety is about going home at the end of the day, kissing your spouse, hugging your kids—it's personal," stated Charlie Morecraft, a safety motivational speaker who relates how his own carelessness on a repair job almost killed him and resulted in burns on over 50 percent of his body, months of hospitalization, rehab, and surgeries (https://www.youtube.com/watch?v=m8UgYUJOkSY). In his momentary carelessness on the job, he didn't think about how extensive the ripple effect of an adverse outcome would be. "I never would have taken any of the shortcuts if I knew what it would do to my children; I don't just mean going home, but to their quality of life—I destroyed it with my accident."

Brad Livingston, another safety motivational speaker, shares Morecraft's perspective. "We don't have the right to decide for other people what they would prefer we do on the job when it comes to taking unnecessary risks," he said, explaining that, by taking a shortcut at work, he effectively decided that his family should be okay with his risk. "I took a shortcut at work and did not stop an unsafe act," he recalled of the decision he and a co-worker made when they decided to weld a repair on a natural gas storage tank. "We assumed information we had been given was correct." Instead of checking the gas level of the tank themselves and consulting with their

supervisor, they went to work and triggered two back-to-back explosions that left Livingston so severely burned he had a 5-percent chance of survival. Livingston pulled through, albeit with great emotional stress to his family and permanent hearing loss, but his co-worker did not (see https://www.americantrainingresources.com/ptv-111.aspx).

When employees become complacent in workplace procedures, they put others at risk. Others, like Butch Evans, whose life was cut short because someone else failed to lock out and tag out of equipment correctly (see https://www.youtube.com/watch?v=1U0_5WlLrQQ).

Strategies to Combat Workplace Safety Complacency

So, how can complacency be avoided when it comes to workplace safety? Biologically speaking, complacency is combatted by firing up the neurons between the prefrontal cortex and the striatum. Practically speaking, complacency can be avoided, according to experts, by providing constructive criticism, which encourages employee growth; having accountability, including regular self-audits and inspections, to prevent apathy for rules and performance; encouraging feedback and anonymous reporting about safety issues that employees see; analyzing close calls; and changing up routine with cross training, team building events, rotating point on projects, and continuous learning.[2,3]

The common denominator in these strategies? Connections. "If [our safety manuals don't] translate into something real with the people you are responsible for,...it means nothing," said Mike Honeyman, regional manager of Arctic Arrow Powerline Group where an employee was electrocuted on the job and survived with significant life-long injuries (see https://www.youtube.com/watch?v=x9WthTBEKsw). "It's about connecting with people and really showing them that when you're talking about safety, you mean it—you actually want them to be safe, and you want them to feel comfortable that they can make calls."

For Honeyman, that means having conversations with his employees and letting them know that he does care about their safety. While Honeyman had developed a safety manual before the incident occurred that checked all of the safety regulation boxes, what has driven the safety message home to his employees is the conversations he has with them. Those conversations are opportunities for him to let his employees know that he truly cares about their safety. One of the best ways to build this kind of empathy, according to OHSA's 7-page guide Better Safety Conversations, is through active listening. The guide also details how to share why you care about safety, how to provide constructive criticism, and how to use stories and your own example to create a powerful safety message (learn more at https://www.osha.gov/sites/default/files/SHP_Better-Safety-Conversations.pdf). Safety conversations are one of the most important tools for ensuring that safety-related problems in the workplace are being discussed and that each worker goes home safe and well at the end of the work day. ■

RESOURCES

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3. Robinson, Angela. ***Workplace Complacency: Definition, Causes & Solutions***. teambuilding.com, 18 Mar 2024. Available: https://teambuilding.com/blog/workplace-complacency

OSHA has a workplace safety video library (https://www.osha.gov/video) and Safety and Health Topics pages (https://www.osha.gov/topics) on a range of topics. A safety conversation app is available from Continuous Mile to help supervisors have effective safety conversations with employees (see https://www.continuousmile.com/leadership/five-step-guide-for-a-safety-conversation/).

Top left: Ryan DeHut. Top right: OCRC project repairing Amber Lake Road washout, including the installation of a new culvert, 2024. (Photos: Courtesy of Ryan DeHut).

Although Ryan DeHut manages the road and bridge network at Ontonagon County Road Commission (OCRC), it may be a surprise that he has a surprising detail in his past: DeHut does not have a background in civil engineering experience. Even though he is not a civil engineer, he brings to the road commission a different perspective through his experience and an eye for managing people.

DeHut grew up in Ontonagon County. After graduating high school, DeHut pursued a degree in electrical engineering technology at Michigan Technological University. He says he was drawn to the "challenge that engineering provides" because "it's basically something new every day". After obtaining his degree, DeHut joined Howmet, where he worked for seven years in engineering of castings. "In the early part of my career, I was a practicing engineer," shared DeHut, "but, in the second half of my career, I did a lot of managing."

DeHut went on to work as a maintenance manager for automation at UPM, a paper mill, for 14 years, and as a production manager at Norbord, a timber products mill, for 3 years.

"Since I was doing a lot of management positions, and I just felt that getting my masters was just the next step to my career," recalled DeHut. So, he attended The College of Saint Scholastica in Duluth for a master's degree in business administration.

In 2021, DeHut was quietly looking for a new job and heard through small-town channels that OCRC was hiring. He was familiar with OCRC as his mom retired in 2008 after 25 years of working at the road commission. Hoping to retire in the area someday, DeHut shared, "When I had the opportunity for a possible job in Ontonagon, I thought, *Well, why not go a little early?*" He continued, "It seemed like I would have a decent opportunity to try for the job with my background".

DeHut got the job, becoming the new manager for OCRC. "I

From Electrical Engineering Technology to Road Commission Management: Ryan DeHut

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basically manage the overall operation of the road commission," he explained. "That includes doing the budget, planning what types of projects we're going to do, planning how to spend both state and federal-aid monies on roads, and doing road and bridge improvements, as well as working with those who directly report to me about the crews under them who do the day-to-day activities."

Still, DeHut has found that his biggest challenge is his lack of a civil engineering background. "A lot of issues that come up when working on roads and bridges are things that maybe I haven't experienced before," DeHut admitted. "But, I've built a good rapport with fellow managers at other road commissions and a couple of engineering firms who I can always bounce off my ideas if I get into something that may be a little over my head."

In fact, DeHut believes that people on his team are his most important asset for success. "The foremen we have working here, they have good experience at the road commission and have worked their way up, so they are a very good resource for me," DeHut shared. He further explained, "I can enable and empower my foremen, and then I expect my foremen to enable and empower the rest of the crew; that's how we can safely get things done on a regular basis." He also emphasizes the value of "leading by example, making sure that expectations are known, and giving the employees a little bit of autonomy to make their own decisions". DeHut added, "But, if they run into problems, they can give me a call and we'll work through it; my door is always open."

DeHut continued, "Overall, workers are out in the field every day—that's the same no matter what industry you're in—and they all just want to do their job and go home safe and be with their families." So, since starting at OCRC, safety of his employees has been a focus for DeHut. "Being in the private industry and big industrial factories, you are tuned differently to safety, so I was able to bring that different safety perspective and made changes and I think it has been positive," shared DeHut. He says there is a bigger emphasis on using personal protective equipment (PPE) when working around heavy equipment and implementing innovative tools to make jobs safer.

Other differences that DeHut has faced are accounting and budget aspects and the public nature of the road commission. "In the private sector, it's all about the dollar but, in government, I have to look at Ontonagon County as a whole and make the best decisions for the whole county," he said. "Sometimes, residents may not agree with my decision because it affects them differently, but it's for the good of the county." Plus, all of OCRC's meetings, bids, and salaries are open for public scrutiny.

Nonetheless, DeHut enjoys investing in those he manages and guiding OCRC in reaching important milestones. "We get a lot of young talent that come into the road commission, and we guide them to become productive heavy equipment operators or good dump truck operators or mowers; it's very rewarding," he shared.

Current project goals for DeHut's second full construction season include three major road projects due to washouts from flooding in spring of 2023. "Our contractors are selected, the projects are rolling, and we're hoping to have these roads opened by fall," DeHut forecasted.

Another exciting project on the horizon is the replacement of the Bond Falls Bridge, which has been on OCRC's docket for years. Because of the Bond Falls Bridge's proximity to a hydro plant and dam, the project will involve working with other organizations like the Upper Peninsula Power Company and Federal Energy Regulatory Commission. But, under DeHut's management the road commission is moving forward with the project. "We have the funding for the 2026 project," he said. "And, we also have the right people in place to get it done."

When he's not actively leading the OCRC crew in what he calls a "very challenging and rewarding career", DeHut enjoys the many recreational activities that the Ontonagon area offers, from fishing on the Ontonagon River to hiking in the Porcupine Mountains. 'Ontonagon is just like this little gem that I probably didn't appreciate enough when I was in high school here," he reflected. "But, I'm at the age now that I appreciate it so much more." ■

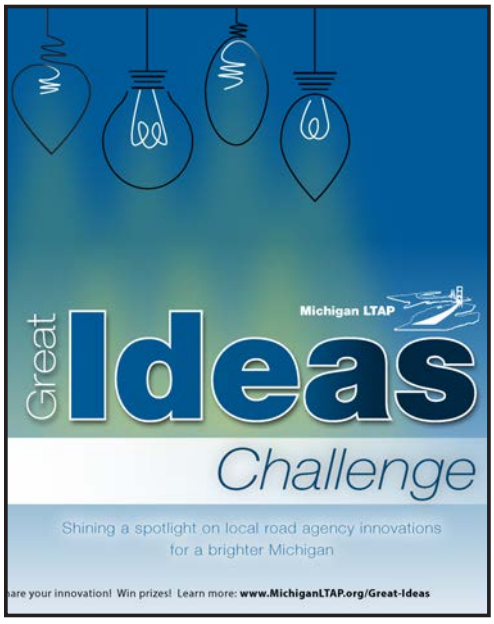
Concrete Resources

Looking for resources for designing and construction concrete pavements? Here's three resources.

The **Michigan Concrete Association** has a ***Concrete Roadway Resources*** dashboard that links to an wealth of resources. From optimizing aggregates and flowable fill to jointing curing and repairs, it's all there at https://info.miconcrete.org/concrete-roadways-resources

The **National Ready Mixed Concrete Association** offers 46 one-page information sheets on an array of technical topics related to concrete work. The series, ***Concrete in Practice***, covers each topic—ranging from types of concrete and issues like cracking and aggregate pop-outs to testing strength and making cylinders in the field—by answering what, how, and why. Each sheet can be viewed on the website at https://www.nrmca.org/association-resources/research-and-engineering/cip/. These information sheets can be viewed for free online; a hard copy set can be ordered for a fee. ■

Photo: CTT Archive



In the 2023 Build a Better Mousetrap competition, the Road Commission of Kalamazoo County (RCKC) earned a Innovative Project Award honorable mention for their Dual Broom Tracker.

See: https://www.fhwa.dot.gov/clas/babm.

MOVE UP: CTT's Workforce Development Opportunities

Job training and workforce development are common initiatives in the workplace of today. While job training helps employees advance in their job-specific knowledge and skills, workforce development is a broader investment in the entire organization and community. It increases the pool of skilled works by addressing the gap in skills through organization-wide or community education and training (see https://www.upwork.com/resources/what-is-workforce-development) .

The Center for Technology & Training (CTT) is offering workforce development training. These trainings are designed to help local agency personnel advance in and attain skills that are essential for effective and efficient work at road- and bridge-owning agencies. The CTT offers its MOVE UP series that includes:

- Basic Traffic Counts
- Cold Weather Work
- Computer Classes (basic and advanced features in Microsoft Word, Excel, and PowerPoint)
- Intro into Welding Defects and Discontinuities
- OBS
- Patching the Cyber Potholes
- Welding Classes
- Welding for Maintenance Workers

Road right-of-way workers can find job training through the American Public Works Association (APWA) Michigan Roads Scholar Program. This three-year training program offers specific training in safe maintenance operations (like mowing and flagging), site safety (including trenching and shoring), GIS mapping, pavement management, trailer safety and licensing, Occupational Safety and Health Administration (OSHA) requirements, emergency response, and more.

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WHAT NOT TO SAY: Guidance for Liability Neutral Language

PART 2

Ron W. Eck, *WVU Professor Emeritus & West Virginia LTAP Director*

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Background & Introduction

The spring 2023 edition of this newsletter included Part 1 of this two-part series on liability neutral language and discussed "What Not To Say" — words and phrases to avoid in agency communications. In this Newsletter, we will examine "What Not To Do" in terms of considerations related to policy and operational documents. As in Part 1, these recommendations are taken from the National Cooperative Highway Research Program (NCHRP) publication Legal Research Digest 83 — Guidelines for Drafting Liability Neutral Transportation Engineering Documents and Communications Strategies (https://nap.nationalacademies.org/25894).

More Recommendations for Liability Neutral Documents & Communication Strategies

Don't Forget to Schedule Regular Policy Reviews

Policy documents and instructional manuals should undergo regularly scheduled comprehensive reviews. The agency should look for information that is confusing or inaccurate and ensure that the processes that were in place at the time the guidance was initially written are still in place. Technical documents should be reviewed by engineering or other technical staff to verify compliance with generally accepted engineering practices. In addition, staff who implement the policy should be involved with its review to ensure that the guidance, as contemplated, can be, or has been, implemented in the field. Agency legal counsel should also be actively involved in revisions to policy, especially when the agency is considering changing descriptions of techniques, guidance or concepts that are frequently the subject of litigation.

When revising a policy, make sure internal consistency is maintained. For instance, a DOT may issue a memorandum instructing their staff to plan for bicycle use on all roads by providing adequate shoulders. If the agency requires a 4-foot shoulder for bicycle use, it should not, in another portion of that technical memo, allow 2-foot shoulders on collector routes.

In example 1, the explanations and words in bold regarding road operations and characteristics provide a multitude of opportunities for the plaintiff. A discussion about the consequences which may occur when a vehicle leaves the roadway should not be found in a maintenance policy or on an agency's website. The statements made in the passage diminish the role of driver error in the sequence of events. Additionally, in another section, the agency has admitted that it has a list of "problem" sidewalks that it has not fixed.

The of the website is to provide information to the public about how and when to contact the agency to report road conditions, not provide an explanation of the reasons that roadways have been constructed. These passages should be rewritten. The passages could be reduced to simply provide contact information for the departments that perform repairs during and after business hours and give examples of the conditions of the road that merit reporting.

Examples 1 & 2

Example 1: County X's Website

The county's website provides instructions to the public on how to report conditions that may require maintenance. A few pertinent parts of the website are set out in the following:

Shoulder Maintenance

Accidents are likely to occur where drivers are called on to make decisions under circumstances where their vehicles are unable to respond properly. When a vehicle leaves the roadway, the driver no longer has the ability to fully control the vehicle. Maintaining usable shoulders along rural roads helps to provide a clear recovery and maneuver room ("space") to escape potential accidents or reduce their severity. **The two (2) basic maintenance problems we face are:** shoulder "drop-offs" which should be scheduled for maintenance and immediate repair if the "drop" from the edge of pavement is greater than 2 inches; and shoulder "build-up" which is handled by cleaning the shoulders, especially after the winter season, and berm removal operations prior to paving.

Sidewalks

The County Highways Division keeps a list of **sidewalk problem locations** that have been reported by residents. If the sidewalk is settled, but not broken, the sidewalk will be temporarily patched with asphalt **if there is a tripping hazard**.

Example 2: County X Suggested Website Rewrite

Maintenance Requests

Please contact the agency via e-mail or phone during regular business hours if you observe any of the following conditions:

- Trees or shrubs blocking the view of oncoming traffic;
- Debris on shoulders or near the road;
- A pothole or sinkhole;
- A clogged drainage ditch;
- Damaged pavement markings/striping/stop bars;
- Shoulder conditions where there is a difference in elevation between the traveled way and the shoulder in excess of two inches;
- A settled or broken sidewalk.

Please call 911 for roadway conditions such as:

- Objects in roadways such as debris, trees or large animal carcasses;
- Downed electric or phone lines;
- A collision;
- Roadway(s) flooding; snow and ice conditions;
- Liquid such as gasoline, oil, on or near the roadway;
- Traffic or pedestrian signal malfunction;
- Missing or damaged red traffic control signs such as stop and speed limit signs;
- Animal carcass obstructing travel lanes;
- Flooding in roadside ditches or in/across roadways.

▶ continued on next page

Liability Neutral Language (continued from page 11)

▶ **Don't Fail to Match Field Conditions to Language in Guidance**

A conflict between written policy and the application of the policy in the field will usually be resolved in favor of the plaintiff rather than the road agency. Language in the policy or guidance must match the practices in the field, and all instructions should be written so that they are easy to understand and interpret. Language should be reviewed periodically for liability issues and to make sure the written guidance is aligned with current practices.

Some roadway conditions, like a missing or damaged stop sign, require immediate attention. Other items, such as a damaged chevron in a series of twelve, can be part of a scheduled repair.

The words "desirable," "acceptable," "tolerable" and "defects" are all expressions of the author's opinion. They do not convey directions, examples, or a clear message.

Instead of opinion words, a list of examples or photographs could be used to convey the message intended by the author.

Another option is to exclusively use a priority system, such as Priority A, Priority B, and Priority C and give examples of those situations.

Regardless of the priority system used, care must be taken by the agency to make sure that the conditions or features of the road that are identified within the priority system are in compliance with the written expectations of the agency.

Example 3: Timing of Repairs as Presented in County Y's Maintenance Manual

County Y prioritizes repair of components that provide for the safety of the traveling public into categories such as priority one, two, and three. It also provides subcategories within its priority one system for guardrail, concrete median barriers, and crash attenuators. Those levels of service are:

Desirable — Maintain all safety appurtenances to original design standards; all hardware functional; no noticeable appearance ***defects***.

Acceptable — Maintain all safety appurtenances to original design standards; all hardware functional; few noticeable appearance ***defects***.

Tolerable — Maintain all safety appurtenances to original design standards; all hardware functional; readily noticeable appearance ***defects***.

Don't Hit SEND Without Carefully Reviewing Your Emails

Emails are frequently and commonly used for communications both within and outside the agency. They may involve policy changes under consideration or may be related to design, construction, or maintenance activities. Texts, emails, and other communications should include only facts that are presented in an understandable, factual, and neutral manner. They may be a good source of documentation of the thought process of staff as they review and revise policies. However, it's important to remember that an email is a legal document, not a conversation. Emails are forever. Don't say anything in an email that you don't want to see on the front page of the local newspaper.

In example 4 above, the City employees are entitled to express their opinions on this matter. However, using the agency email system, which is subject to discovery during the legal process, is not the appropriate forum. They can discuss their thoughts in the break room or in the parking lot.

Example 4: Two City Z's Employees' Emails

Two technician employees of City Z's public works department are discussing, via agency email, the recently released design plans to reconstruct a major intersection in the city. Snippets of their email thread follow.

Heather: "What do ya think of the left turn design from Maple to Fifth?"

Ryan: "Looks ***dangerous*** to me! It's creating a ***trap*** for southbound pedestrians. Somebody could get ***killed*** there."

Heather: "Agreed!!!"

The numerous "loaded" words, shown in bold italics in this email example, would be used to advantage by a plaintiff's attorney. Part 1 of this article discusses additional words that should be avoided.

Media Training

Media training is essential for any staff member who has the potential to be a department spokesperson. ■

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Media Training Tips

1. Prepare in advance. Find out the topics that will be covered in the interview and know who will be conducting it and whether it is for print or television. Be able to provide factual information, such as statistics, dates, or dollars spent.
2. Identify the major points of discussion and plan to present accurate and timely information in an understandable way. Use words that your audience will understand. Be prepared and plan different ways to convey the message. Memorize key points and be ready to explain them.
3. Plan the specific words that you intend to use. While spokespeople can be misquoted or quotes taken out of context, a well-prepared spokesperson can avoid a trap.
4. Provide the information that has been requested. Share information that is useful, but be aware of the potential for disaster. Do not stray very far from the message you intended to provide.
5. Do not answer a question that is unclear. Ask for clarification or for the question to be reworded. Do not guess. If necessary, tell the reporter that information will be provided later.
6. Practice in front of a mirror and with friends, family, or colleagues.
7. Dress appropriately for the context of the interview. The appropriate attire for a construction zone, a public meeting, and a television interview varies considerably.
8. If a statement has been made by the reporter that is false or misleading, address it. Otherwise, remaining quiet may send the message that you agree with the statement. Beware of statements that are mostly true or correct, yet contain an error or falsehood. A phrase such as "before we change subjects, please let me clarify" can be used to redirect the conversation.
9. Take a breath. Don't rush to answer a question, especially if it is a difficult one. With some practice, experienced speakers are able to control the message and the interview.
10. Ask for help. Media training classes and workshops are widely available. Larger agencies have community outreach staff who can also provide assistance.

Liability-neutral Language Guidance for Michigan's Local Road-owning Agencies

Allison Szlachta, *Technical Writing Intern*
Center for Technology & Training

Precision and accuracy in language are essential for local road-owning agencies as they draft policies and everyday communications. Yet, the choice of words can mean the difference between an effective document and a lawsuit. While this might seem overwhelming, Michigan's local agencies are not alone.

Don't Have a Written Policy Unless It's Absolutely Necessary

Don't use words or language that make it harder to be successful within the workplace. Adam Tountas, shareholder and head of the litigation department at Smith Haughey Rice & Roegge in Grand Rapids, Michigan, suggests that agencies "not have a written policy unless they need one". If one is necessary, that policy should reflect the industry's standard best practice. Any time an internal policy, set of guidelines, or piece of guidance is drafted, the language used should reflect the realities in the field, like limited resources, insufficient time, or increased traffic. "The words you use to describe the industry standard are the words that are either going to protect the people in the field, or put a spear through their heart," Toutnas emphasized.

Use Words that Mitigate Risk

Using language that reduces liability and mitigates the risk is the best way to remain liability neutral. Tountas defines liability -neutral language as "any language that does not purport to create a duty or obligation on the part of the governmental agency in excess of the one prescribed by law". In Michigan, road-owning agencies have the legislated duty to maintain and repair the improved portion of the highway designed for vehicular travel (not inclusive of sidewalks, trailways, crosswalks, signage, lighting, traffic control devices, and other installations outside of the improved portion of highway) so that it is reasonably safe and convenient for public travel regardless of type of travel and traveler.[1] With that in mind, Tountas said, "You don't want to use words or language that make it harder for you to do your job and easier for you to be sued." Road-owning agencies can best protect themselves by choosing words that are liability neutral. "Any time you draft an internal policy or set of guidelines or guidance, the language should reflect realities in the field, which are limited resources, insufficient time, and so forth," Tountas continued. He says that words that characterize any roadway features as something negative or problematic—like "defect"—create risk. For example, both a PASER 10 and a PASER 1 road are equally "safe" if road users recognize that different surface features require different driving techniques and speeds appropriate to the conditions, but labels like "poor" and "failed" readily get weaponized, he points out. "The language that's most helpful language doesn't try to impute an elevated responsibility on the road agency's part and doesn't pretend like roads are inherently perfect," noted Tountas. Liability-neutral language can shield the agency and its employees from potential claims or lawsuits. ■

RESOURCES

1. County Road Association of Michigan. ***Michigan County Road Commissioners Handbook***. 2017. p. 59-60. Available: https://issuu.com/micountyroads/docs/commissionershandbook_cra2016rev2

Photo: Shutterstock

Great Ideas—Where They Are Today
In Focus: An Innovative Tool for Collecting and Analyzing Data

Emily Bergman, *Technical Writing Intern*
Center for Technology & Training

The Berrien County Road Department (BCRD) took second place in the 2016 Michigan LTAP Great Ideas Challenge with their Automated Road Maintenance Project Spreadsheet (ARMPS) but has since been replaced by new features in the Roadsoft software suite.

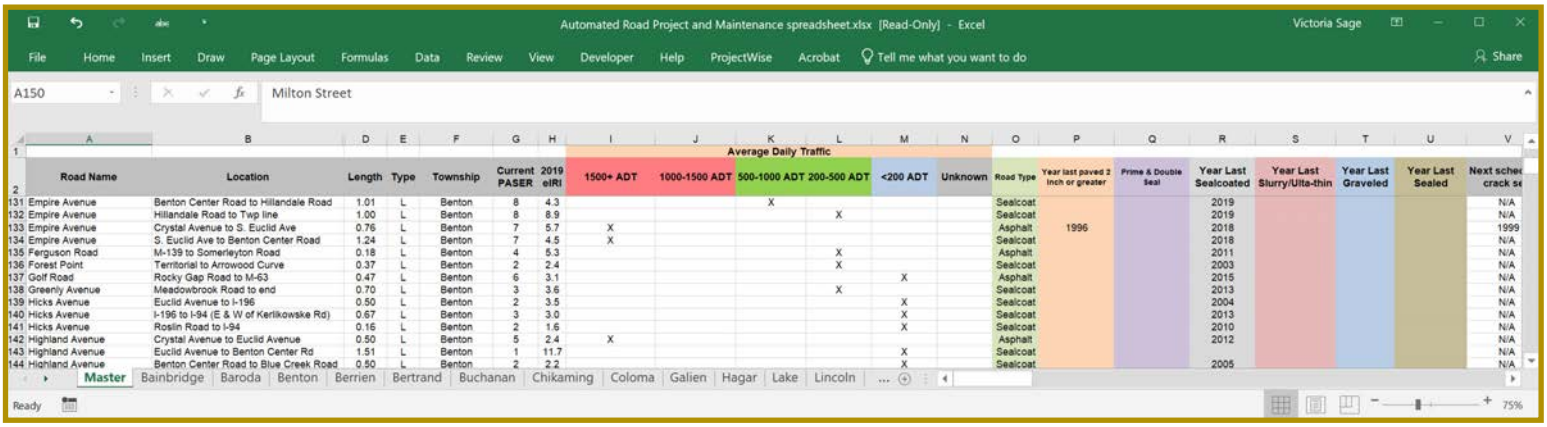
BCRD made use of Microsoft Excel spreadsheets to track the history of maintenance and construction on roads under its jurisdiction as well as schedule future activities and estimated future maintenance costs. "We were trying to get a better focus on how we picked road projects," shared Michael Juengling, now recently retired, who served as traffic safety supervisor at BCRD. The driving question that led to the development of their automated spreadsheets was "what's the minimum we can do to save this road or prolong its life?", according to Juengling.

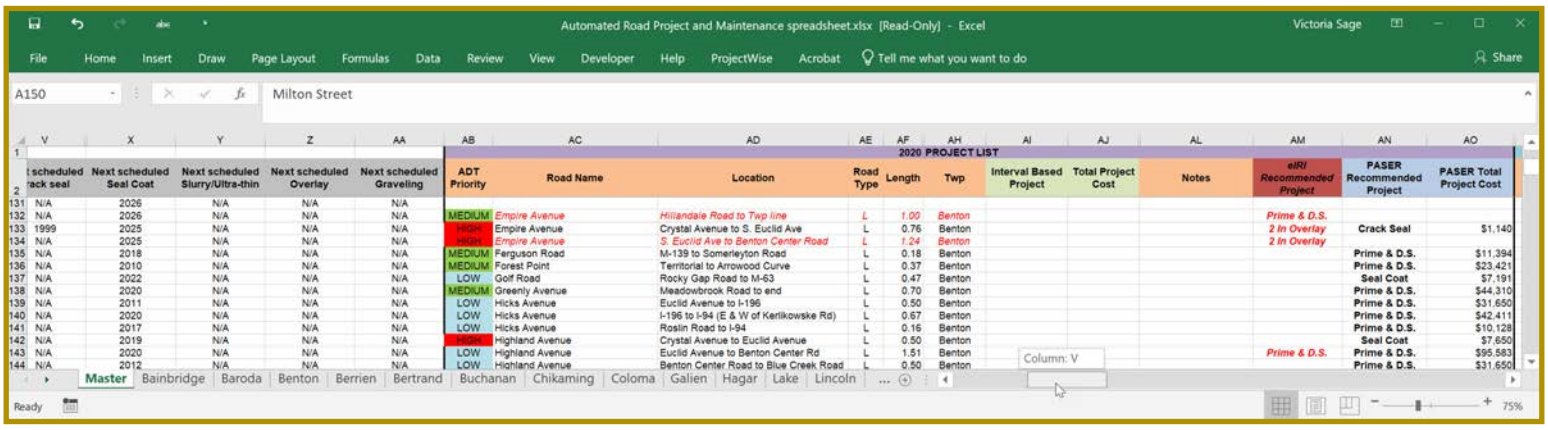
The ARMPS spreadsheets contained formulas that used a list of agency-owned roads, current PASER scores, average daily traffic counts, road surface types, maintenance history of the segment, average project costs, and anticipated inflation to create timelines for future projects, ultimately answering their key question using an "engineering data driven process". Juengling says this process allowed for better justifications of maintenance decisions to supervisors and better financial decision making. "We want to do the right fix at the right time," he added, "not just put a little seal coat on it and then four years later you're right back to a poor rating because it really didn't fix anything."

Although this system worked well, the Excel spreadsheet required a lot of manual data entry, making it "cumbersome to maintain and keep it up to date", notes Juengling.

BCRD was already maintaining all of their PASER data in Roadsoft. And, with Roadsoft's ability to build strategies, much like the formulas in the ARMPS, store agency budget data, and make future projections on the percentage of their roads that would be in good condition. With Roadsoft, they could compare how much money they have in their budget to how much they would need in order to meet their road maintenance goals. "Roadsoft can predict in 10 years if a road is going to be rated at 4," explained Juengling. "It can look at your whole system relatively quickly, and project its future rating." He acknowledges that the ARMPS "couldn't really do this as easily".

"Either way, you have to have the data," emphasized Juengling. "It's really important to get in the habit of collecting your PASER scores at least every other year in order to have a good history on the road." With good condition data, agencies can make informed maintenance decisions. Juengling added, "Data is the driver that drives your decisions on what road to do a project on, and what kind of project or maintenance to do." ■





Screenshots of Berrien County Road Department's Automated Road Maintenance Project Spreadsheet (Photos: Berrien CRD)

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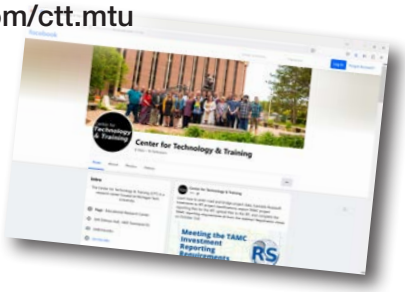

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Michigan's Local Technical Assistance Program

The Center for Technology & Training (CTT) is a part of the Department of Civil, Environmental, and Geospatial 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 ctt.mtu.edu.

The Bridge

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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.

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