Vol. 31, No. 1 – Summer 2017

The Bridge

A quarterly newsletter from Michigan's Local Technical Assistance Program

One Way to Muzzle a Citation: How the Appropriate Training Keeps You Safe at a Mine Site

Photo: Pixabay, CC0 Public Domain

Local agency employees encounter mining operations whenever they enter a stone or sand-and-gravel pit. Knowing what training is required helps keep everyone safe.

Victoria Sage – Technical Writer
Center for Technology & Training

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Michigan's Local Technical Assistance Program

Retrieving aggregate or sand from a nearby crushing operation can expose local road agency personnel to serious injury or death. In fact, the leading cause of death at stone and sand-and-gravel operations—which classify as mining operations—has included simply falling, rolling, or sliding rock or material.

"A lot of [people] don't realize how dangerous it is if you are wandering around a gravel pit or quarry and not paying attention," noted Matt Portfleet, director of the Mine Safety Program, which is funded by the Mine Safety and Health Administration and housed at Michigan Technological University's Department of Geological and Mining Engineering and Sciences.

In an effort to eliminate fatalities and avoid injuries, the U.S. Department of Labor's Mine Safety and Health Administration (MSHA) has established rules and regulations for ensuring that mining operations are "safe and healthful workplaces for U.S. miners".

But, what may seem like a clear regulation for mining personnel and their contractors is not so clear for county road commissions and other local agency employees who find themselves retrieving aggregate or sand, dropping off concrete, or testing stock piles at a stone or sand-and-gravel operations.

An Operation Called 'Mining'

The *Code of Federal Regulations Title 30: Mineral Resources* (CFR) is the set of rules that govern the processing of materials extracted from the earth. According to Part 46 of the CFR, a mine site is "an area of the mine" or the stone and sand-and-gravel site where there are "mining operations"—that is, "mine development, drilling, blasting, extraction, milling, crushing, screening, or sizing of minerals at a mine" as well as "maintenance and repair of mining equipment" and "haulage of materials within a mine from these activities" (§46.2).

For the people engaged in mining operations, the CFR requires specialized forms of mine safety training—new miner training, newly hired experienced miner training, or new task training (§46.5-46.7). Portfleet explains that there are two tracks for the training programs geared toward the different types of mining—surface mining and underground mining. While initial trainings require either 24 or 40 hours respectively, mandated annual refreshers help keep the concepts fresh in one's mind in an eight-hour session (§46.8).

"It's the foreman or whoever's in charge of safety who [has] that [responsibility] to make sure everyone gets trained," explained Portfleet. "Ultimately, if you are the person in charge, what they call the owner or operator or safety advisor of a mine location, that means you're in charge of safety."

Jim Johnson, engineer at Leelanau County Road Commission (CRC), notes that "it takes a lot of effort to go through the Part 46 documents and set up a [safety] training program". Although Leelanau's mining operations are now officially "abandoned" according to its MSHA status, the county had been involved in mining and stock-piling winter sand and aggregate during almost the entire hundred years of the CRC's existence and for much of Johnson's time at the county.

▸ Muzzle a Citation, page 5

▶ Replenishing fluids, eating healthy snacks, and resting in the shade are important for keeping the body's core temperature at safe levels: pages 7-9

Photo: CTI Archive

Letter from the Editor

Gather some colleagues together. Sit in a circle or stand in a straight line. If you are the first person in the circle or line, whisper a phrase into the ear of the person next to you. If you are a subsequent player, whisper the phrase that you heard into the next player's ear. If you are the last player in the circle or line, say the phrase out loud so everyone can hear. Is it the same phrase as when the game started?

I am sure that many of us are familiar with the telephone game. It is a simple game, but it drives home two important points: Without good communication, our message will not be effectively transmitted. And, achieving good communication is not always easy.

This issue of *The Bridge* looks at ways in which good communication impacts local agencies. The first article digs into the different types of mine safety training and when they are required. For many local agencies, their personnel who retrieve materials from or drop off loads at a mine site will need site-specific hazard awareness training, which is all about good communication! Mine sites have many dangers lurking there, so mine operators need to communicate with visitors how to conduct themselves safely in and around those dangers.

> "The single biggest problem in communication is the illusion that it has taken place."
> – George Bernard Shaw

Since summer is prime road-work season in Michigan, this issue highlights safe work practices that should be communicated to workers on a road crew as the temperatures rise. Warmer weather means the human body is physiologically going to have a harder time cooling itself. So, making sure workers know how to acclimatize, how to keep themselves cool, and what to do in case of a heat-illness emergency is important.

In this issue, we also consider the best ways to share information about your agency's initiatives with the seniors in your community. While many agencies have now taken to Facebook, Twitter, and other social media platforms for communicating the particulars of road detours or closures or the details about plowing operations, numerous residents in the communities they serve—especially seniors—may not have access to or familiarity with these newer communication platforms. So, how can we reach seniors who do not use social media? Kansas LTAP's Lisa Harris offers several strategies for getting the word out to seniors and others who do not use social media.

Finally, we present one way that the Michigan Transportation Asset Management Council's *Michigan's Roads & Bridges Annual Report* can be used as a tool for communicating your agency's needs. The statewide data contained in the report can help agencies show their local officials and residents how their agency is performing overall. And, more importantly, it can communicate what local officials and residents might see on their road and bridge network if their local agency's asset management practices and funding continue on the same current course.

George Bernard Shaw once said that the "single biggest problem in communication is the illusion that it has taken place". We can achieve good communication if we formulate a clear and concise message. We can make that communication more effective if we ground it in concrete and coherent examples. But, most importantly, communication is about connecting people and/or places so, for communication to take place, we need to transmit that message to our audience *with* our audience in mind.

Victoria

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How to Reach Seniors With Your Agency's Communications

Lisa Harris – Director
Kansas Local Technical Assistance Program

Small communities across the country have waning newspaper circulations and many are losing their newspapers altogether. The City of De Soto has faced this issue; five years ago, the local newspaper went out of business. This affects the city's ability to reach citizens with notices about public meetings and other time-sensitive information—especially older citizens and others who don't use the internet.

"Ever since the paper went out, it's been a struggle for us to reach our older citizens who can't or won't use electronic communications," said Mike Brungardt, De Soto city engineer. "Frustrated citizens tell our council members, and our council members tell us. These citizens really feel left in the dark with no reliable way to get good information."

Brungardt said that the city has tried to figure out ways to reach citizens who don't use the internet, but, in his opinion, they are coming up short, compared with a newspaper. For example, the city has teamed up with the school district and the Lawrence Journal-World to produce a quarterly newsletter with city information. "It's nice, but it's not news," he said. "The information is provided by the city, and it is not objectively reported."

Brungardt said the Journal-World used to send an e-reporter to public meetings to report both sides of an issue, but they no longer do that, and even then, that content was only available online.

"The only private news publication left in De Soto is a little online newspaper that reports obituaries," Brungardt said, "but again, many seniors don't or can't access it."

So how DO you reach seniors? We will provide some ideas in the article, plus discuss some considerations for reaching the growing numbers of seniors who are using the internet to communicate.

Recommendations for Communication Strategies in Reaching Seniors

Letter
- Hard copy letter delivered to address

Notices and information at natural gathering places
- Doctor's offices
- Senior centers
- Public library
- Public functions
- Mall or grocery store displays/booths
- Nursing homes or senior housing

Two-way dialogue
- Education and information programs
- Meetings and presentations
- Workshops
- One-on-one meetings

Outreach via professionals/ volunteers
- Public health
- Home care
- Long-term care staff
- Volunteer bureau
- Book delivery services
- Public transit services

Websites and social media

Partnering ideas
- Seniors' newsletter
- Welcome wagon package for new seniors
- Community directory
- One-stop information center

Adapted from: *Terrace and Area Seniors Needs Study*, 2006. Cited in: "Communication Mechanisms for Delivering Information to Seniors in a Changing Small Town Context". *Journal of Rural and Community Development*. Volume 6, Number 1, 2011.

Reaching Seniors Who Do Not Use the Internet

We did not find a lot of information out there on this topic, but we did find a useful report from our neighbors in Canada about how to reach seniors in rural areas. Some senior residents may not want to use the internet or may not have the ability to access the technology in remote areas.

The sidebar on this page shows ideas for reaching senior citizens, including those who do not use the internet.

You will likely have to think of innovative ways to get the word out, perhaps partnering with organizations or services with frequent contact with seniors. It may be helpful to put together an advisory group of seniors to brainstorm ideas for better communication.

Internet Users Who Are Seniors

Email considerations. An article at govdelivery.com said studies show that senior citizens are fast adopting email as one of their primary methods of digital interaction and communication. The article cited a Pew Internet and American Life Project that said that 87 percent of senior citizens (age 66-74) and 82 percent of seniors age 75-plus use email and search engines. The Nielsen Company found that checking email was the primary online activity for 88.6 percent of seniors. With these statistics, it is clear that government organizations could benefit greatly by reaching out to seniors via email.

Government organizations can greatly

▶ continued on next page

www.MichiganLTAP.org | Page 3

How to Write Facebook Posts for Your Senior Citizens

Trying to get the word out about a current road closure or an upcoming project to the senior citizens in your community? Keep these two things in mind: dwell time and jargon.

Research has shown that senior citizens will linger several times longer on your page than your audience in younger age demographics, according to Aidan Hijleh of Benchmark Email. So, move beyond the eye-catching graphics and the few compelling words. Engage your senior citizen audience with more detailed content that keeps their attention and even narrative posts that attracts their empathy, recommends Hijleh.

While avoid jargon is universal advice for external-facing media, jargon is very "alienat[ing]" to senior citizens, argues Hijleh. Keep the vocabulary simple and easy to understand.

For general guidance on writing for social media, visit the *CDC Guide to Writing for Social Media* at https://www.cdc.gov/socialmedia/tools/guidelines/guideforwriting.html. To tailor your posts for senior citizens in your community, see *How to Appeal to Facebook's Fastest Growing Demographic: Seniors* by Aiden Hijleh at http://www.adweek.com/digital/facebook-seniors/. *—The Editor*

▶ benefit from implementing email outreach campaigns and other digital communications efforts to engage and inform the senior citizen demographic. One benefit to email, unlike other forms of more costly communication, such as direct mail or telephone calls, people's preferences and response to emails can be tracked, allowing you to understand what is most interesting to this demographic so you can send information that is most relevant to them. Instead of waiting for senior citizens to come to your website, you could proactively send these citizens notices and news they are seeking.

Website and social media site design considerations. The Pew study shows that more than half of the senior citizens — even more than Millenials — are going online visit a government website to find information relevant to them. When tech-savvy baby boomers mature into the senior demographic, the US Census Bureau predicts nearly one in five Americans will be seniors — and likely using the internet. However, with age comes some impairments that affect the ability to see and process complex information. Governments should strive to have their internet communications be senior-friendly.

A publication titled *Age Friendly Communication: Facts, Tips and Ideas*, contains some excellent information on ways to design online sites to be more attractive and usable for seniors. Its website checklist (page 26 of the publication) contains tips for typeface, writing style, use of images and animation, and navigation that can be helpful for communicating with seniors. For example, the checklist recommends using a sans serif font in upper and lower case for the body text, for easier readability. It suggests presenting information in a clear, simple, and familiar way, and to use the active voice. It suggests supporting any icons with descriptive text, if possible.

All these tips help senior website users who may be become confused navigating a more complicated site for the information they need.

Conclusion

Start a dialogue with your government's communications manager, or with other departments, to see if you can improve communication and outreach to seniors, not only to report things that have happened, but to announce programs and meetings seniors might wish to participate in, or attend. Consider innovative ways to share information—or to partner in sharing information.

Some seniors are tech savvy, and more will be so in the next few decades. Keep in mind their information needs as you develop your web site and social media. Learn what makes website and social media site design more senior-friendly, and make some changes to your site designs, if needed.

For more information, consult the sources below. ■

Reprinted from Kansas LTAP Newsletter, *Winter 2014, with permission. Available at: http://kutc.ku.edu/sites/kutc.drupal.ku.edu/files/docs/LTAP_Newsletters/LTAP2014-Winter.pdf*

RESOURCES

1. Govdelivery. http://www.govdelivery.com/blog/2012/07/tech-savvy-senior-citizens-on-the-rise/
2. *Who Are Social Media's Newest Members? Seniors!* Rescue Alert of California. Accessed March 12, 2014. See: http://rescuealertofca.com/who-are-social-medias-newest-members-seniors
3. Public Health Agency of Canada. 2010. See: http://www.phac-aspc.gc.ca/seniors-aines/publications/public/various-varies/afcomm-commavecaines/2-eng.php
4. Ryser, Laura and Halser, Greg. *Communication Mechanisms for Delivering Information to Seniors in a Changing Small Town Context*. Journal of Rural and Community Development. Volume 6, Number 1, 2011.
5. Interview. Mike Brungardt. City of De Soto. March 14, 2014.

Are Seniors Using Social Media?

Photo: Pixabay, CC0 Public Domain

The Neilson Company did an interesting survey in 2009 to investigate how seniors use their time online. The top types of uses of the internet for seniors were the same as for most other users: e-mail, mapping, checking the weather, and paying bills. What sites did they visit most when surfing the web? #1 was Google search, #2 Windows Media Player, and #3...Facebook! Just the year before, Facebook was #45 spot among online destinations for seniors. In a year, Facebook went up 42 spots in use by seniors. And, that was in 2009.

We checked a few prominent websites serving seniors and, sure enough, they have Facebook and Twitter accounts. Check out those links for the Kansas Department for Aging and Disability (http://www.kdads.ks.gov/) and AARP Kansas (http://states.aarp.org/category/kansas/). *Editor's note:* In Michigan, check out the Michigan Department of Health and Human Services Aging & Adult Services Agency (http://www.michigan.gov/osa).

The Neilson study indicates that seniors are a growing demographic in use of social media. That is good to keep in mind as your city or county uses this avenue for communication.

Source: http://rescuealertofca.com/who-are-social-medias-newest-members-seniors

Muzzle a Citation (continued from Page 1)

▶ How Do the Rules Apply?

Local agency personnel encounter mining operations in a variety of typical scenarios.

"We used our own mine for making winter sand, so essentially it is a sand pit," explained Steve Defour, manager of Oscoda CRC. "We have our own screen plant that we used to screen sand," he continued. Like Leelanau CRC, however, Oscoda County's mining operations are now inactive. Despite that fact, Defour says that several of his employees continue to receive the eight-hour annual mine safety training refresher course "just in case we decide to make the mine active again".

"Anyone who works at a mine has to be trained before they start work," Portfleet explained, "[whether they're the] contractors, engineering companies, surveyors, actual mining companies,…or the [person] that changes tires and gets called in [to the mine site] ten days a year…if you are working sand-and-gravel operations or a big underground mine, if you are selling mineral for a profit, you fall under MSHA." From a local agency's perspective, that requirement for mine safety training only applies to specific employees—those who would be considered "miners".

A miner, states Part 46, is "any person, including any operator or supervisor, who works at a mine and is engaged in mining operations" as well as "independent contractors and employees of independent contractors who are engaged in mining operations" and "any construction worker who is exposed to hazards of mining operations" (§46.2). For Leelanau County, that meant that the "loader operator had to be a trained miner and the people running the crusher and the screen had to be trained miners", according to Johnson.

And, what about the county personnel needing to collect samples of aggregate for testing? According to the MSHA North Central District Office, inspecting stockpiles and testing aggregate are activities that are "generally considered part of the mining process and training would be required".

But, what about the local agency truck driver who goes to the mine site to retrieve gravel or aggregate or to drop off other materials for blending or crushing? Part 46 calls these people "customers" or "commercial over-the-road truck drivers" (§46.11); they are typically involved with hauling loads on and off the mine site. Along with customers or commercial over-the road truckers, scientific workers, Part 46 includes delivery workers, maintenance workers who do not work at the mine site for frequent or extended periods, and vendors in its definition of "visitors", not "miners" (§46.11).

Non-miners present at a mine site still require training though, but only a particular type of training that Part 46 calls *site-specific hazard awareness training* (§46.11). Educating non-miners about the hazards they may encounter or the applicable emergency procedures can be done through written instruction, oral instructions, signs and posted warning, or other appropriate media.

Johnson says that a typical site-specific hazard awareness training can be a "one-page document that outlines some basic simple rules for behavior at the pit". At Leelanau's mine site, for example, site-specific pit rules asked that visitors "stay in [their] vehicle at all times, stay on the haul roads that are established, recognize the speed limit…, and tarp [their] load outside the active work area or outside the gates so we don't have pedestrians wandering around big machinery". The recommendations were designed to keep visitors safe at Leelanau's mining operation.

Blast area at a sand-and-gravel operation

For more information...

Mine Safety and Health Administration (MSHA):
https://www.msha.gov/

Title 30 Code of Federal Regulations – Parts 1-199: Mineral Resources:
https://arlweb.msha.gov/regs/30cfr/

Compliance Guideline for MSHA's Part 46 Training Regulations:
https://arlweb.msha.gov/TRAINING/part46/compguide/compguide.pdf

There is one caveat to the requirement for having site-specific hazard awareness training: An untrained non-miner can visit a mine site without training *as long as* he or she is "accompanied at all times by an experienced miner who is familiar with hazards specific to the mine site", states Part 46 (§46.11 and *Compliance Guide for Part 46* #3).

Since local agency mechanics have experience working on heavy machinery, it is not unlikely that a local agency might be asked to enter a mine site and maintain or repair a piece of mining equipment. As long as the work is an isolated occurrence and of short duration, local agency mechanics would still be considered non-miners and would not need mine safety training, according to both Part 46 and the *Compliance Guideline for MSHA's Part 46 Training Regulations*, a document that further defines the regulations outlined in the CFR (§46.11 and #34). But, if the maintenance or repair work on mining-specific equipment becomes "frequent" (work that is repeatedly being done) or "extended" (lasting five days or more), local agency mechanics would then require mine safety training due to their exposure to "many of the same hazards of other miners".

The MSHA 'Pit Bull'

"The most prominent safety law attorney acting to defend clients who have been given citations will tell you that 'for those of you who are familiar with OSHA, OSHA is the puppy dog of enforcement, Mine Safety is the pit bull'", related Johnson.

That's because the types of penalties and the severity of penalties issued by MSHA

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Muzzle a Citation
(continued from Page 5)

▶ can quickly increase and compound. "They want to get people's attention at the onset," Johnson said, "and they don't want to come back and write you 15 citations."

Any violation of the regulations in the "Mine Act, mandatory health or safety standards, rules, orders, or regulations" is punishable by a citation. "Training is mandatory; it isn't optional," said Portfleet regarding the different types of trainings required by Part 46. "If you are not doing the trainings, you will be definitely liable for that."[1]

Getting Trained: The Better for It

"If you are doing mining, you have to do the training;…the main goal is to keep miners safe," emphasized Portfleet. "If it's good training, I think it does help. It raises awareness. And, the more you review the stuff, the more you do it, the more you cover it, the more you talk about it—the better."

Portfleet says that anyone who needs training should contact his office. He'll schedule the class on or near to the mining operation's site. Multiple agencies can attend one event, and he'll typically train anywhere between 12 and 35 miners at a time.

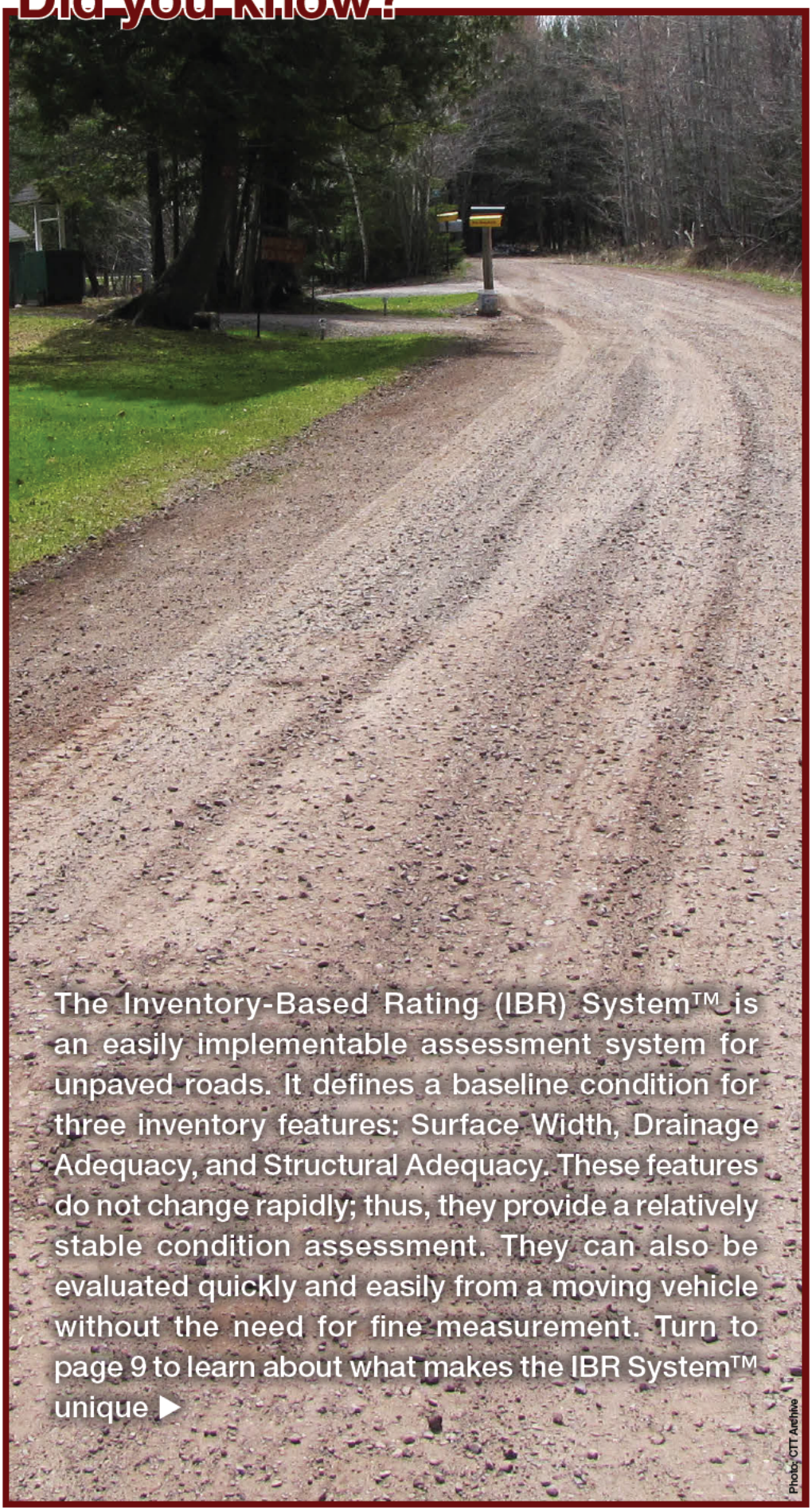
Johnson also suggests supervisory trainings offered by the Joseph A. Holmes Safety Association, a non-profit association that promotes mining health and safety, in order to enhance safety awareness. Their all-day sessions introduce participants to the issues that arise on a mine site, different types of citations, mining-operations-related safety innovations and technologies. He encourages agencies that have questions about compliance to "consult a professional who is schooled in Part 46 and who can give you good advice." Local agencies can find MSHA field office contacts in Lansing and Marquette who can advise on Part 46 compliance at https://www msha.gov/about/program-areas/metal-and-nonmetal-mine-safety-and-health/offices/north-central-district. ■

REFERENCES

1. An explanation of citations and orders can be found at: https://arlweb.msha.gov/programs/assess/citationsandorders.asp

Editor's note: A copy of this article was supplied to the Mine Safety and Health Administration for their review; however, at the time of publication, their response is still pending. Further questions can be directed to the Michigan LTAP. For more clarification, contact MSHA Lower Michigan office – George Colby (517) 377-1751, MSHA Upper Michigan office – Paul Blome (906) 228-6805, or MSHA North Central District Office – (218) 720-5448.

Did you know?



The Inventory-Based Rating (IBR) System™ is an easily implementable assessment system for unpaved roads. It defines a baseline condition for three inventory features: Surface Width, Drainage Adequacy, and Structural Adequacy. These features do not change rapidly; thus, they provide a relatively stable condition assessment. They can also be evaluated quickly and easily from a moving vehicle without the need for fine measurement. Turn to page 9 to learn about what makes the IBR System™ unique ▶

Photo: CTT Archive

Keeping Your Cool When Things Heat Up

Victoria Sage – Technical Writer
Center for Technology & Training

Photo: CTT Archive

Flagging is probably one of the least exertional jobs during road work and, on a construction project. One employee on a road patch crew for a project in Illinois in 2009 was assigned to flagging after rotating through a series of jobs in the earlier part of the day—driving a pick-up truck, manually spreading asphalt, and controlling a dump truck tailgate chute—and after taking both mid- and late-morning cooling breaks. While he was flagging, the employee fell to one knee. He rested in an air-conditioned truck and consumed drinking water and other sports drinks. But, he continued to refuse medical attention, likely because he did not want to be seen as the weak person on the team. Shortly thereafter, he began convulsing and lost consciousness. He was transported to the hospital where he was pronounced dead.[1]

The cause of his death? Heat exhaustion. To combat heat exhaustion, OSHA has a mantra of 'water–rest–shade'. While that may be good guidance, won't it stigmatize you as the weakling who piddles around doing nothing?

When Heat Stokes for Different Folks

Following water, rest, and shade guidance is not a sign of weakness but a response to a medical reality that we all face. While hot temperatures have an impact on all of us, heat does affect people differently. In fact, did you know that most heat-related fatalities occur during the first three days of work at a new job?[2,3] By the time you are a seasoned employee, you've typically built up a tolerance—although not an immunity—to working in the heat. That's because the human body is good at adjusting to climatic conditions, also known as *acclimatizing*.

However, in 2012, a U.S. Postal Service mail carrier in Missouri was returning to work after a week of vacation. Temperatures were in the triple digits. On the 23rd of July, he reported to his supervisor that he was feeling ill from the heat. But, fearing harassment and having been denied a reprieve, he went in to work on the 24th, driving a non-air-conditioned truck and hauling a 35-pound mail bag. At 2:50 p m., the mail carrier was found unconscious and transported to the hospital, where his body temperature was measured at 108°F (42.2°C) before he died of heat stroke. He had worked with the mail service for 28 years.[4]

Shouldn't he have been used to working in the heat? Being adjusted to working in the heat only lasts so long. An absence of one week or more is enough to diminish one's tolerance.

New and returning employees will need to acclimatize to working in the heat in order to prevent heat illness. A 2012-2013 study by the Center for Disease Control (CDC) found that the "most common deficiency and the factor most clearly associated with [heat-related] death" was a company's lack of an acclimatization requirement.[5] The CDC has a recommended acclimatization plan, which they detail in their *Protect Your Workers from Heat Stress* infographic (see page 9), to help workers build their tolerance.

More than a Comfort Issue

It can be easy to fall into the mindset that surviving the heat is a comfort issue, not a health issue. But, even the human body follows the basic laws of thermodynamics.

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When Things Heat Up (continued from Page 7)

Normal body temperature is 97.7-99.5°F (36.5-37.5°C). As air temperatures get closer to normal body temperature, it becomes more difficult for the body to cool itself. In fact, outdoor temperatures as low as the 70-79°F (21-26°C) can make that cooling process difficult and can put workers who do moderate to heavy labor outside at risk for heat illnesses like heat cramps, heat syncope, heat exhaustion, and heat stroke.

Exertional heat stroke, also known as hyperthermia accompanied by a systemic inflammatory response, can occur within hours of physical activity in hot weather[6] and has a significant mortality rate and morbidity[7] (learn about the signs of heat illnesses: https://michiganltap.org/sites/ltap/files/publications/bridge/Bridge30-1.pdf). It's earliest hallmark generally is central nervous system dysfunction, so symptoms like headaches, dizziness, and confusion.[7]

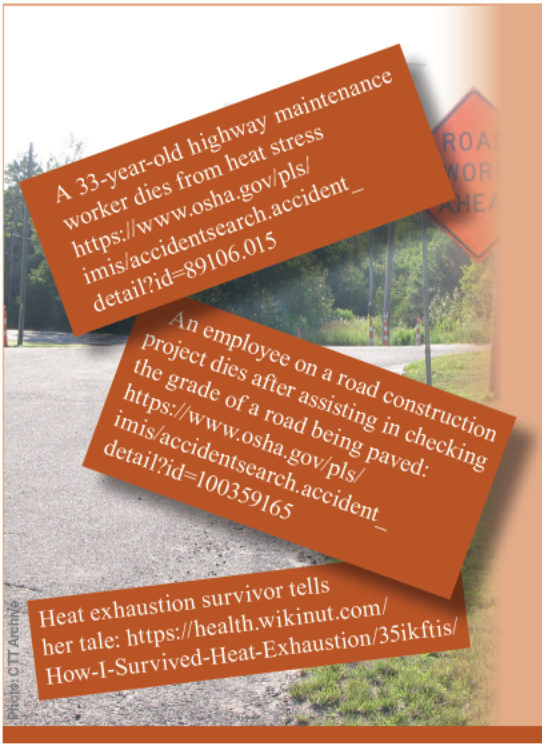
According to Mayo Clinic, signs and symptoms of heat illness can be sudden or slow in onset.[8] However, once heat stroke has set in, the human body can only sustain its thermal maximum—a core body temperature of 107.6°F (42°C)—for 45 minutes to 8 hours before cellular damage occurs.[7] Therefore, early recognition of heat illness is critical for preventing a permanent disability, organ failure, or death. For heat stroke in particular, treatment without delay increases the chances of survival.[7] If a co-worker is exhibiting symptoms of heat exhaustion or heat stroke, it is important to begin first aid and seek emergency attention. Here's what you can do when you see a co-worker presenting with symptoms of heat illness[9,10]:

1. Notify your supervisor. If heat stroke, call for medical help. If heat exhaustion, monitor symptoms for 60 minutes; if symptoms do not improve, take the person to a medical clinic or emergency room.
2. Move the person to a cool, shady place to rest. Stay with the person.
3. Give the person water if he/she is not losing consciousness or vomiting.
4. Loosen the person's clothing.
5. Help cool the person: Fan the person, put ice packs on the person's groin and underarms, or soak the person's clothing in cool water.
6. Do not let worker return to work that day.

Heat illness can be deadly, but it can be prevented! Aside from acclimatizing, the CDC also details ways to keep core body temperatures at safe levels in its *Protect Your Workers from Heat Stress* infographic (see page 9). Workers can safely know that acclimatizing and seeking water, rest, and shade are the voluntary things they can do to influence the body's thermoregulatory process when the workday heat intensifies. ■

RESOURCES

1. OSHA case details: http://tinyurl.com/osha-312726920
2. NOAA heat illness map: http://tinyurl.com/noaa-map-arcgis-MapJournal
3. OSHA heat illness accident cases: http://tinyurl.com/osha-accident-search
4. OSHA case details: http://tinyurl.com/osha-538158-015. Kansas City Star: http://tinyurl.com/kcstar-mail-carrier-death
5. Arbury, S.; Jacklitsch, B.; Farquah, O.; Hodgson, M.; Lamson, G.; Martin, H.; Profitt, A. *Heat Illness and Death Among Workers—United, States, 2012-2013*. Available at: https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6331a1.htm
6. http://www.merckmanuals.com/professional/injuries-poisoning/heat-illness/heatstroke
7. Glazer, James L. Management of Heatstroke and Heat Exhaustion. *American Family Physician*, 71:11, 2005. pp 2133-2140. Available at: http://www.aafp.org/afp/2005/0601/p2133.html
8. Mayo Clinic Staff. *Heat exhaustion*. Mayoclinic.org. Available at: http://tinyurl.com/mayoclinic-heat-exhaustion
9. Detailed first aid instructions: https://www.osha.gov/SLTC/heatstress/heat_illnesses.html
10. Adapted from: OSHA. *Heat Illness Prevention Training Guide: A Lesson Plan for Employers*, 2011. Available at: https://www.osha.gov/SLTC/heatillness/osha_heattraining_guide_0411.pdf



Two technologies to help you 'beat the heat'

1. Cooling garments

NASA developed liquid cooling garments to keep astronauts cool under their space suits. Liquid cooling garments have polyvinyl chloride tubes laced throughout the garment to circulate cool water around the wearer's core, keeping the person cool. These garments have been used by firefighters, factory workers, and surgeons to help them stay at their peak performance. Cooling garments can range between $100 and $400.

2. Smartphone app

Download OSHA's heat safety tool: https://www.osha.gov/SLTC/heatillness/heat_index/heat_app.html

Keep in mind, heat indexes are for the shade. Working in direct sunlight can add up to 15°F (8°C) to the heat index.

Warm temperatures that are less than 91°F (33°C) still require caution; use basic heat safety measures and planning.

Water. Rest. Shade.

PROTECT YOUR WORKERS FROM

HEAT STRESS

Develop an acclimatization plan

Acclimatization is the result of beneficial physiological adaptations (e.g., increased sweating efficiency and stabilization of the circulation) that occur after gradual increased exposure to a hot environment.

TIP 1

Gradually increase the time spent in hot environmental conditions over a 7–14 day period.

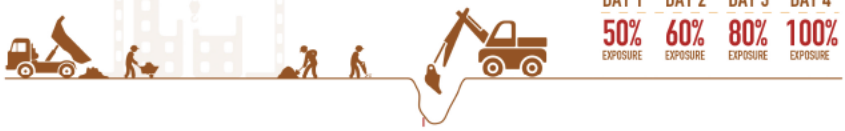
TIP 2

For new workers, the schedule should be no more than 20% exposure to heat on day 1 and an increase of no more than 20% exposure on each additional day.

TIP 3

For workers who have had previous experience with the job, the acclimatization schedule should be no more than:

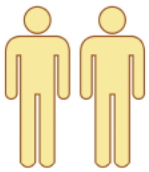
DAY 1	DAY 2	DAY 3	DAY 4
50% EXPOSURE	60% EXPOSURE	80% EXPOSURE	100% EXPOSURE



Set up a buddy system

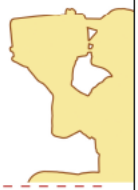
Check your workers routinely to make sure...

- ☑ they make use of readily available water and shade.
- ☑ they don't have heat-related symptoms.



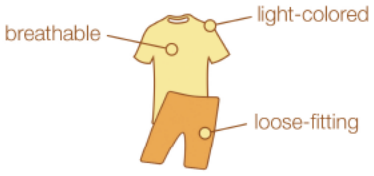
Schedule and encourage frequent rest breaks...

...with water breaks in shaded or air-conditioned recovery areas.



Emphasize the need for appropriate clothing

Encourage workers to wear clothing that is...



Cotton clothing can be soaked in water to aid cooling.

Be aware that protective clothing or **personal protective equipment** may increase the risk of heat stress.

Encourage workers to drink plenty of fluids...

...such as drinking small amounts of water before becoming thirsty.

During moderate activity in moderately hot conditions, workers should drink about...

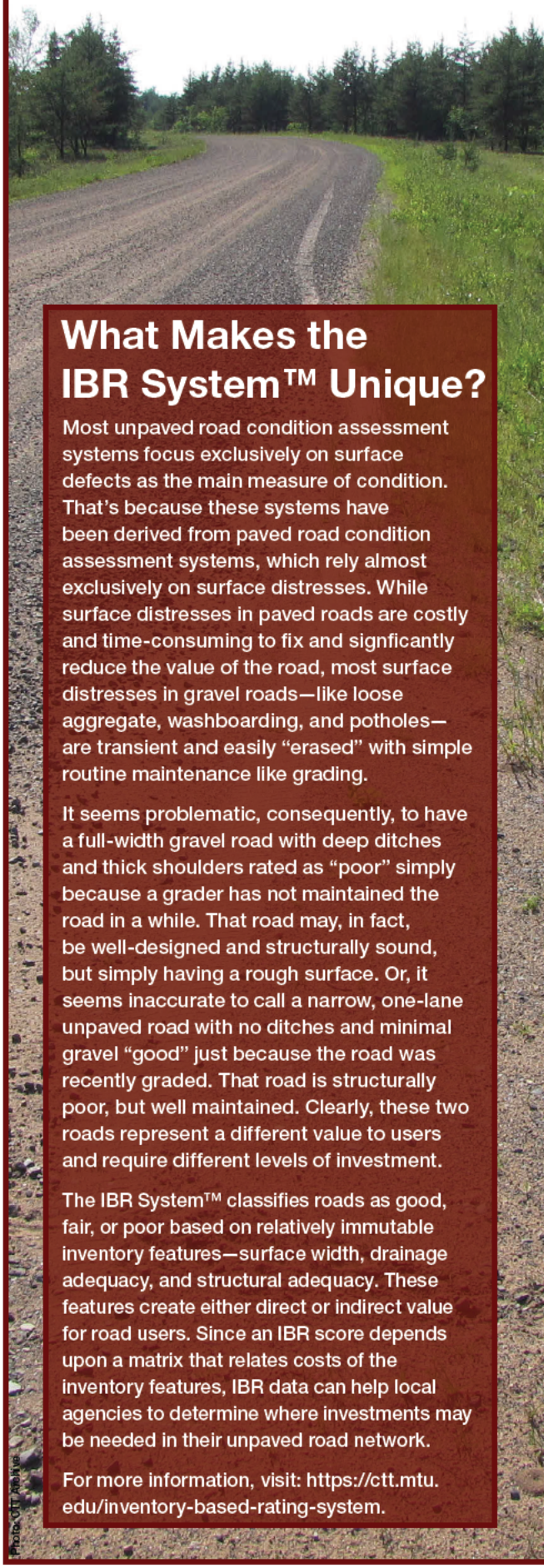
1 cup every 15 to 20 minutes.

Learn more about heat stress at: **www.cdc.gov/niosh/topics/heatstress**

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

CDC Workplace Safety and Health | NIOSH

Available at https://www.cdc.gov/niosh/topics/heatstress/infographic.html



What Makes the IBR System™ Unique?

Most unpaved road condition assessment systems focus exclusively on surface defects as the main measure of condition. That's because these systems have been derived from paved road condition assessment systems, which rely almost exclusively on surface distresses. While surface distresses in paved roads are costly and time-consuming to fix and signficantly reduce the value of the road, most surface distresses in gravel roads—like loose aggregate, washboarding, and potholes—are transient and easily "erased" with simple routine maintenance like grading.

It seems problematic, consequently, to have a full-width gravel road with deep ditches and thick shoulders rated as "poor" simply because a grader has not maintained the road in a while. That road may, in fact, be well-designed and structurally sound, but simply having a rough surface. Or, it seems inaccurate to call a narrow, one-lane unpaved road with no ditches and minimal gravel "good" just because the road was recently graded. That road is structurally poor, but well maintained. Clearly, these two roads represent a different value to users and require different levels of investment.

The IBR System™ classifies roads as good, fair, or poor based on relatively immutable inventory features—surface width, drainage adequacy, and structural adequacy. These features create either direct or indirect value for road users. Since an IBR score depends upon a matrix that relates costs of the inventory features, IBR data can help local agencies to determine where investments may be needed in their unpaved road network.

For more information, visit: https://ctt.mtu.edu/inventory-based-rating-system.

Photo: CTT Archive

Photos: Courtesy of MDOT Photo Unit

Mechanisms for Change:
Using the *Michigan's Roads & Bridges Annual Report* as an Asset Management Tool

Administration, Communication, and Education (ACE) Committee
Michigan Transportation Asset Management Council

Michigan has almost 58,000 lane miles of paved Federal-aid roads and over 11,000 bridges under the jurisdiction of cities, villages, counties, and the Michigan Department of Transportation. Michigan's governor, Rick Snyder, recognizes that those public roads and bridges are "vital for many [of the state's residents] to get to work and school". Integral to the maintenance and improvement of Michigan's transportation network was a bill package that Snyder signed in November 2015, implementing long-term funding for Michigan's transportation network.

In 2017, the State began distributing some of this long-term funding to transportation agencies for network improvements. For the City of Farmington Hills, its assistant manager Gary Mekjian says they've been "appreciative of the actions taken by the State Legislature to increase road funding". However, Mekjian says they're seeing that "the new funding still falls far short of the needs of the system".

Consequently, local governments like the City of Farmington Hills are already planning and strategizing how best to maintain their road and bridge networks with asset management principles and supplemental funding. For Mekjian, the *Michigan's Roads & Bridges 2016 Annual Report* provides his agency with "a guideline or benchmark…to compare its overall pavement conditions to those statewide." This year, Mekjian found himself comparing the City of Farmington Hills' network to a statewide increase in the number of miles in "poor" condition on the Federal-aid-eligible road network. What is surprising is that a decline in the transportation network statewide is occurring despite many agencies in Michigan already practicing asset management principles and the influx of additional state and federal transportation funding.

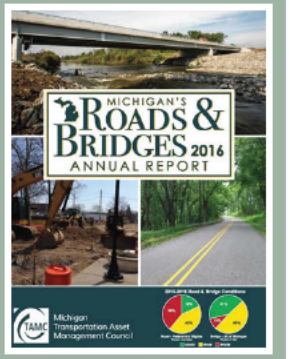
If local agencies want to make improvements to their transportation network, it's both the statewide and local communities that can offer valuable support. Because of this, the annual report is given to elected officials on the Michigan Legislature and the State Transportation Commission, each year. George Heartwell, Michigan State Transportation commissioner and former mayor of the City of Grand Rapids, called the report a "great place for a local government to start in understanding the process and purposes of asset management". He noted that the report can help elected officials in understanding the "benefits of having [an asset management] plan in place".

At the local level, elected officials who understand the importance of transportation asset management recognize the consequences associated with decisions to finance capital preventive maintenance treatments. It is also in their purview to rally local community support. Therefore, the City of Farmington Hills is now seeking local community support for reconstruction, operation, and maintenance of its local, non-Federal-aid-eligible streets. They're asking voters in 2017 to approve a tax increase to stabilize their budget to meet their network's needs. With the hoped-for increase in funding at the local level supplementing the state funding and with a good asset management plan in place, the City of Farmington Hills anticipates continued improvement of their road and bridge conditions despite the forecasted decline in the condition of transportation assets statewide.

The transportation asset management data contained in the annual report offers Michigan's agencies a tool for "[knowing] clearly where they stand" and for "driv[ing] future decision making and influenc[ing] the trend of [the transportation asset conditions]'", according to Jon Start, executive director of the Kalamazoo Area Transportation Study and member of the Michigan Transportation Asset Management Council (TAMC). The report is produced and distributed annually by the Michigan TAMC.

For further information about the Annual Report, visit the TAMC website: http://tamc mcgi.state.mi.us/TAMC/docs/aboutus/annualReports/2016_Annual_Report-Full_Version.pdf. ■

Inside the annual report...



- The 2016 condition data indicates that 18% of road are in good condition, 43% are in fair condition, and 39% are in poor condition. In 2015, the breakdown was 17% in good condition, 45% in fair condition, and 38% in poor condition.
- Over the past ten years (2007-2016), Federal-aid roads in Michigan have gotten significantly worse, with more miles in poor condition than good.
- This year's report reveals that Michigan had a 0.6% improvement in the condition of bridges compared to the previous year's report; this year, only 11.1% of bridges are rated as "structurally deficient".
- Over the past eight years (2009-2016), the number of bridges in good and fair condition have increased while bridges in poor condition have decreased.

Center for Technology & Training

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

The Bridge

The Bridge is published quarterly by the Center for Technology & Training (CTT) through Michigan's Local Technical Assistance Program at Michigan Technological University. Subscriptions are free of charge. To request a subscription, contact the CTT.

Michigan's Local Technical Assistance Program
Center for Technology & Training
Michigan Technological University
309 Dillman Hall
1400 Townsend Dr.
Houghton, MI 49931-1295

Telephone 906-487-2102
Fax 906-487-3409
E-mail ..... CTT@mtu.edu
Website ..... www.MichiganLTAP.org

The Bridge is printed with soy-based ink on recycled, acid-free paper (50% recycled, 10% post-consumer waste). 4,000 copies mailed this edition.

Michigan LTAP Staff

Administration
Tim Colling, PhD, PE ..... Director
Christine Codere ..... Sr. Project Manager, Training & Operations
Cynthia Elder ..... Workshop Coordinator

Writing
Victoria Sage, MSc ..... Editor, Technical Writer
Micaiah Grossmann ..... Technical Writing Intern

Engineering
Chris Gilbertson, PhD, PE ..... Associate Director
John Kiefer, PE ..... Research Engineer II
Pete Torola, PE ..... Research Engineer II
Andy Manty, PE ..... Research Engineer II
Kelsey Fournier ..... Engineering Intern

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.

Federal Highway Administration
Kurt E. Zachary, PE 517-702-1832
Local Program Engineer, FHWA

Michigan Department of Transportation
Bruce Kadzban, PE 517-335-2229
Local Agency Programs, MDOT

County Road Association of Michigan
Wayne Schoonover, PE 231-757-2882
Manager/Director, Mason County Road Commission

Sponsored by:
U.S. Department of Transportation
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MDOT Michigan Department of Transportation
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Vol. 31, No. 1 – Summer 2017

Michigan's Local Technical Assistance Program
Michigan Technological University
309 Dillman Hall
1400 Townsend Drive
Houghton, MI 49931-1295
906-487-2102

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Houghton, Michigan
49931

Upcoming Events

Register at ctt.mtu.edu/training

2017 Bridge Load Rating Workshop & Webinar Series
August 22, August 29, September 12 (workshop in Dimondale), October 24, December 5

Gravel Road Basics for Local Officials
September 20 – Kalamazoo

2017 Presentation Skills Webinar
September 21

2017 Michigan Transportation Asset Management Conference
October 5, 2017 — Marquette

2017 Winter Operations Conference
October 17-18, 2017 — Bellaire

SAVE THE DATE: 2017 Intro to Roadsoft (Hands-on) Training
October 31 – Lansing

SAVE THE DATE: 2017 Roadsoft User Conference (RUCUS)
November 1 — Lansing

SAVE THE DATE: 2018 County Engineers' Workshop
February 13-15 — Bellaire

SAVE THE DATE: 2018 Michigan Bridge Conference
March 20-21 — Ann Arbor