



**ENGINEERING OPERATIONS COMMITTEE  
MEETING MINUTES  
November 25, 2020, 9:00 A.M. – 11:00 A.M.  
VIA TEAMS**

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|          |                |                  |                |
|----------|----------------|------------------|----------------|
| Present: | Carol Aldrich  | Mark Geib        | Brad Wieferich |
|          | Mark Bott      | Jason Gutting    | Gorette Yung   |
|          | Gregg Brunner  | Tony Kratofil    | Hal Zweng      |
|          | Matt Chynoweth | Ryan Mitchell    |                |
|          | Mark Dionise   | Kristin Schuster |                |
| Absent:  | Rebecca Curtis | Brandy Solak     | Will Thompson  |
| Guests:  | Chris Brookes  | John Nadjarian   | Carlos Torres  |
|          | Robert Green   | Lindsey Renner   | Brad Wagner    |
|          | Lynne Kirby    | Justin Schenkel  |                |
|          | Ben Krom       | Mark Sweeney     |                |

**OLD BUSINESS**

1. Approval of the October 29, 2020 Meeting Minutes – Tony Kratofil

*ACTION: Approved*

2. Michigan Department of Transportation (MDOT) New Materials and Products – Jason Gutting

- a. New Material Monthly Report of Data

- ❖ Number of Submittals Received
- ❖ Number of Submittals Under Review by Subject Matter Expert (documentation and/or product review, dialogue with manufacturer, etc.)
- ❖ Number of Submittals Being Field Reviewed, Tested, or Engaged with a Pilot Effort
- ❖ Number of Submittals in the Special Provision Development Phase
- ❖ Number of Submittals Approved (approval by steering committee)
- ❖ Number of Submittals Rejected

*ACTION: For information only. Will be adding new items for specifications quality products list to the summary report.*

NEW BUSINESS

1. Safety Topic: Winter Driving Safety Tips – Mark Bott

<See Appendix A at end of document>

*ACTION: For Information Only*

2. Pavement Demonstration Program Evaluation Plan for US-24 from Grand River to North of 8 Mile Road, Wayne County – Justin Schenkel

Issue(s) – To present the Pavement Demonstration Program evaluation plan for the following job:

- JN 132102, US-24 from Grand River to north of 8 Mile Road in Wayne County (scheduled let date of 03/05/2021) – Hot mix asphalt with stabilized subgrade demonstration project

Background – The Pavement Demonstration Project for JN 132102 on US-24 was approved by the Engineering Operations Committee (EOC) per the August 27, 2020 meeting. However, the request was made that an evaluation plan be drafted and reviewed by MDOT and its industry partners. As a result of this request, the evaluation plan was written; “Michigan Department of Transportation Pavement Demonstration Program Project Evaluation Plan US-24 Hot Mix Asphalt with Stabilized Subgrade (MDOT Job Number 132102).”

This document was reviewed by the MDOT Pavement Management team, Metro Region personnel, and MDOT industry partners. All parties were informed that this document will serve as the formal evaluation plan used for future reference.

Recommendation(s) – This EOC agenda item is informational only, so no action needed. This is presented to record that the follow-up action is fulfilled and that the evaluation plan is complete.

*ACTION: For Information Only*

3. Barrier Replacements on National Highway System Structures When Deck Overhang Cannot be Replaced – Brad Wagner

Issue Statement – Barrier replacements on National Highway System (NHS) structures when deck overhang cannot be replaced.

Major Issue(s) – The current American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design Bridge Design Specifications do not contain Manual for Assessing Safety Hardware (MASH) design impact loads for bridge railings, which are needed for evaluating barrier modifications such as adhesive anchored

railings to existing bridge decks. The Texas A&M Transportation Institute (TTI) provided MASH design load recommendations as part of their evaluation of various bridge railings under Research Program National Cooperative Highway Research Program (NCHRP) 20-07, Task 395. However, analyses have shown that Type 6 and Type 7 railings with adhesive anchored connections to an existing bridge deck do not have adequate strength to withstand TTI's recommended design MASH impact loads. As a result, MDOT has no option currently for replacing existing barriers on NHS route bridges that have a deck slab that is integral to the superstructure or is otherwise not replaceable without replacing the superstructure.

Background/History - When implementing Type 6 and Type 7 bridge railings, the structural investigation determined that the use of adhesive anchored bridge railings would not meet the loading required in accordance with MASH Test Level 4 (TL-4). Although the proposed Type 6 railings adhesive anchored to bridge decks will not meet MASH TL-4 loading requirements, they do meet the requirements of NCHRP 350, TL-4. As a result, adhesive anchored barriers have been limited to Non-National Highway System (non-NHS) routes.

For NHS routes, a poor condition railing must be removed and replaced, along with the deck overhang. However, for some superstructure types (including concrete t-beams and side by side box beams) it is not feasible to replace the deck overhang without replacing the superstructure. Superstructure replacement impacts construction duration, causes significant traffic impacts, and is more costly when compared to barrier replacement.

Further, superstructures typically have significantly longer service life than barriers. Requiring superstructure replacement of an otherwise good or fair condition superstructure due to a poor barrier will have significant impacts on MDOT's ability to manage our bridge assets.

Recommendation(s) – Adopt an exception process for barrier replacements on NHS structures when it is not feasible to replace the deck overhang. The exception process will consider remaining service life of the existing superstructure and may permit the use of adhesive anchored barrier railings designed to NCHRP 350, TL-3 or TL-4 design impact loads, when the superstructure is in good or fair condition. Exceptions will be subject to approval of the Bureau of Bridges and Structures Chief Structure Design Engineer.

*ACTION: Approved*

#### 4. Two-Tube Bridge Railing Review and Recommendations – Carlos Torres

Subject/Issue - Two-Tube Bridge Railing Review and Recommendations

Major Issue(s) – The Alaska DOT successfully conducted the full suite of MASH, TL-4 crash tests on a 42” tall modified two-tube bridge railing, as well as a guardrail anchorage attached directly to the steel tube railing without a concrete end block. Federal Highway Administration (FHWA) eligibility letter B-327 was issued on 11/19/19 for the Alaska modified two-tube bridge railing as a MASH, TL-4 device. However, some members of

MDOT's Barrier Advisory Committee and Bridge Committee reviewed the Alaska modified two-tube railing, and had the following concerns:

- a. **Reduced Base Welded Studs**  
MDOT prefers bolting through tubes to posts instead of using reduced base welded studs. Studs may break off when tightened, and the weld quality may not be in acceptable condition.
- b. **Rail Splice Detail**  
The Alaska rail splice detail is of the fully expansion type. The detail is welded to one tube and slid into the adjoining tube (expansion side). No detail exists with a fixed splice. MDOT's details are bolted at both details (fixed and expansion) and allow expansion when expansion is required or desired.
- c. **Non-Shrinking Grout Pedestals and Leveling Nuts for Base Plates**  
MDOT does not use either of these and seems to have success with simple casting of the anchor bolts into the curb/brush block and placing the base plate on the curb/brush block. Also, there are concerns with the durability of non-shrink grout pedestals. Previous experience on Michigan roadways has shown there are durability issues after several years of exposure to weather.
- d. **Deck Overhang/Fascia Thickness**  
The crash test details, and Alaska's details, show a 6" fascia. MDOT generally has a fascia as thick as the deck thickness; normally 9" and sometimes more. Anchor bolt steel reinforcement modifications may be necessary as a result.
- e. **Curb and Guardrail Anchoring System**  
The curb taper, as detailed on the Alaska standard, may affect the location of the approach curb and gutter. Also, Alaska's guardrail anchorage is different from the MASH-compliant guardrail anchorages currently used by MDOT. The guardrail attachment to the bridge railing is with a plate attached to the longitudinal tubes and then attachment of approach guardrail to that plate. MDOT's general preference is to use a concrete end wall instead of attaching guardrail directly to a steel railing.
- f. **Railing with Adjacent Pedestrian Facilities**  
When a pedestrian facility is present adjacent to the railing, a longitudinal tube would be required to adhere to the pass-through requirement of the AASHTO LRFD Bridge Design Specifications (13.8.1). This is not an option with Alaska's current design, so a railing modification would be required to meet AASHTO's pass-through requirement. The additional tube would have to be located between the curb/brush block and the lower longitudinal tube.

Background/History – As indicated in the MDOT Action Plan for Bridge Railings Let After December 31, 2019, dated 11/20/18, MDOT's current two-tube bridge railing (Standard Plan B-21 Series) is a 32 ½" tall barrier that is NCHRP 350, TL-4 compliant. The Texas A&M

University Transportation Institute (TTI) evaluated the Alaska Multi-State, Two-Tube bridge railing, which matches MDOT's current two-tube bridge railing. The evaluation was done as part of NCHRP 20-07, Task 395, MASH Equivalency of NCHRP Report 350-Approved Bridge Railings, and it was determined by TTI that the Alaska Multi-State bridge railing is MASH, TL-3 compliant. This is TTI's professional opinion since crash testing was not conducted.

MDOT's current preference is to use Test Level 4 bridge railings. However, FHWA allows the use of Test Level 3 bridge railings on the NHS.

MDOT's bridge railing action plan, dated 11/2018, stated that if the proposed MASH, TL-4 crash testing on Alaska's modified two-tube bridge railing was conducted and deemed successful, then Alaska's modified two-tube bridge railing would be further evaluated and considered as a replacement for MDOT's current two-tube bridge railing design (Standard Plan B-21-Series). However, multiple issues were revealed after further evaluation.

Recommendation(s) – Alaska's 42" tall, MASH, TL-4, modified two-tube bridge railing is not recommended for use by MDOT. Instead, continued use of MDOT's current two-tube railing (Standard Plan B-21 Series) is recommended as a MASH, TL-3 device per TTI's opinion published in the NCHRP 20-07, Task 395 report.

*ACTION: Information Only. MDOT will continue with its two-tube bridge railing and not change to Alaska's version.*

5. Capital Preventative Maintenance Manual (CPM) Updates: December 2020 Edition – Rob Green

Subject/Issue – CPM Manual December 2020 Edition

Issue Statement - The current version of the CPM Manual that is available for use is the 2003 edition with minor updates in April 2010. The December 2020 edition is an update in organization and content of the manual along with new sections.

Major Issue(s) – The content in the CPM manual is currently 10 years old or older. MDOT and national specifications and practices have changed significantly within this time. The current manual also uses pavement management data such as Ride Quality Index that is no longer calculated and used.

Pavement preservation practices also include a few new types of materials that MDOT has been using for the past few years with success. However, the current manual makes no reference to these materials and their use.

Background/History – The CPM manual has a history of being revised to stay current with MDOT and national standards. The first version contained all the CPM specifications within it. Over the years, the specifications were pulled out, but other updates were made

including added International Roughness Index, updating references from metric to English units, and adding the emerging technology program.

The revised manual updates the content to align with current MDOT and national standards and practices.

Recommendation(s) – Approve and adopt the revised CPM Manual. Once approved, the revised manual will be submitted to be published on MDOT’s website for both internal and external use.

Status - Comments have been solicited from and reviewed by the Michigan Road Preservation Association, the Asphalt Pavement Association of Michigan, and the Michigan Concrete Association (MCA). Other sections have also been reviewed by internal senior management executives as well. Awaiting EOC review and approval.

*ACTION: Approved with minor edits as discussed.*

6. Hot Mix Asphalt (HMA) Pavement Selection: I-75, From Levering Road to US-31, Cheboygan County – Ben Krom

Subject/Issue - Pavement Selection

Route/Location: I-75, from Levering Road to US-31, Cheboygan County

Job Number: 130014

Control Section: 16092

Letting Date: 6/3/2022

Department policy requires that a Life Cycle Cost Analysis (LCCA) be used to determine the most cost-effective pavement design.

Major Issue(s) – None. The paving industries had no comments on this LCCA.

Background/History – Pavement selection was determined using the procedures outlined in the MDOT Pavement Selection Manual. Department policy requires that the pavement alternate with the lowest Equivalent Uniform Annual Cost (EUAC) be selected. Final pavement selection requires approval by the Engineering Operations Committee.

Recommendation(s) – Approve the pavement alternate with the lowest EUAC.

*ACTION: Approved*

7. Jointed Plain Concrete Pavement Selection (JPCP): I-275, From Northline Road to Five Mile Road, Wayne County – Ben Krom

Subject/Issue - Pavement Selection

Route/Location: I-275, from Northline Rd to Five Mile Rd, Wayne County

Job Number: 111073, 114723

Control Section: 82291, 82292, 82293

Letting Date: 5/7/2021

Department policy requires that a LCCA be used to determine the most cost-effective pavement design.

Major Issue(s) – The MCA objected to both the HMA and concrete pavement designs used in this LCCA. MDOT Pavement Management staff replied that the current MDOT design methodology was used for both alternatives, stating: MDOT uses the AASHTO 1993 and Mechanistic Empirical (ME) pavement design methodologies. The AASHTO 1993 design is still a key component of MDOT pavement design because the final ME design must be within 1” of the AASHTO 1993 design. For this project, the ME pavement design for JPCP was more than the AASHTO 1993 +1” threshold, so the final recommended design was 12”, considering that the AASHTO 1993 design was 11”. For the HMA alternative, the ME result was less than the AASHTO 1993 -1” threshold, so the final recommended design was 10”, considering that the AASHTO 1993 design was 11”.

Background/History – Pavement selection was determined using the procedures outlined in the MDOT Pavement Selection Manual. Department Policy requires that the pavement alternate with the lowest EUAC be selected. Final pavement selection requires approval by the EOC.

Recommendation(s) – Approve the pavement alternate with the lowest EUAC.

*ACTION: Approved*

8. Hot Mix Asphalt Pavement Selection: US-23, From Huron Street to Mill Creek Discovery Park, Cheboygan County – Ben Krom

Subject/Issue: Pavement Selection

Route/Location: US-23, from Huron St to Mill Creek Discovery Park, Cheboygan County

Job Number: 208357

Control Section: 16033

Letting Date: 12/2/2022

Department policy requires that a LCCA be used to determine the most cost-effective pavement design.

Major Issue(s) – None. The paving industries had no comments on this LCCA.

Background/History – Pavement selection was determined using the procedures outlined in the MDOT Pavement Selection Manual. Department policy requires that the pavement alternate with the lowest EUAC be selected. Final pavement selection requires approval by the EOC.

Recommendation(s) – Approve the pavement alternate with the lowest EUAC.

*ACTION: Approved*

9. Work Zone Speed Limits on 75 Miles Per Hour (mph) Posted Roadways – Lindsey Renner/Chris Brookes

Issue Statement – The creation of 75 mph speed limits on 600 miles of MDOT trunkline has provided an increase in worker exposure and sign clutter as well as inconsistency of signing application throughout our state work zones.

Recommendation(s) – It is recommended that work zone speed limits on 75 mph posted roadways are allowed a 15-mph drop in speed from 75 mph to 60 mph, without the use of intermediary signage. This will allow for reduced worker exposure, reduced sign clutter, and better consistency of application throughout the state.

Status – To accomplish this goal the following items need to happen:

- Work Zone Safety Mobility Manual Chapter 6.03 and Appendix Examples will need to change to reflect the 15 mph drop
- System Operations Advisory 2017-003 will need to be retracted or amended
- Creation of work zone typically showing a 75 to 60 mph speed reduction. Maintaining Traffic Typical Tables for D distance already include a D distance of 750 feet for a 75 mph to 60 mph reduction (Excerpt of Draft shown in Figure 5, Typical shown in Appendix B). This has been accomplished and is included in White Paper.

*ACTION: Approved pending FHWA consideration.*

10. Update to Guidance Document 10202 – Uniformed Law Enforcement in Work Zones – Lindsey Renner

*ACTION: Tabled until future EOC meeting.*



## 11. Revisions to the Work Zone Mobility Manual (WZSMM)– Lindsey Renner/Chris Brookes

Issue Statement – Revisions to the Work Zone Safety Mobility Manual

Major Issue(s) – The WZSMM has incorporated many updates including process changes supported by the EOC. Last version of the WZSMM presented to the EOC and approved on 10/3/2019.

Background/History - Construction Field Services (CFS) has identified that the following items may be considered major changes per the EOC guidance document and therefore require EOC review and approval:

- Section 1.02.03 Peer Review Team: Concept approved by the Region Bureau Management Team on 3/12/2020 based on successful piloting which removed statewide review of Transportation Management Plans (TMPs) and placed the review internal to the region.
- Section 1.02.07 Design-Build (DB) TMP Reviews and 1.02.06 Alternate Technical Concept (ATC) TMP review: Elimination of requirement for TMPs on ATC for Maintenance of Traffic (MOT) projects and DB projects. Concept approved by the EOC on March 26, 2020.
- Section 4.05 Work Zone Law Enforcement: Provided language more assertive of what scenarios should use Work Zone Enforcement, provided estimating tools and guidance on how to add funding for this effort as well as what forms are required federally and with the State Police.
- Section 6.01.12 Temporary Pavement Markings: Provide link to newly created PAVE-904-A Temporary Longitudinal Line Types & Placement Details. This implements the change approved by the EOC on January 21, 2020 to increase some pavement marking widths to six (6) inches.
- Section 6.03 Quality Guidelines, Exhibits 6-20 through 6-28: Photographs have been added to better guide the field on appropriate condition rates for temporary traffic control devices. These photographs existed and were agreed upon prior to Work Zone Management Unit moving to Construction Field Services. In a MDOT/ Michigan Infrastructure & Transportation Association (MITA) Work Zones Meeting, Rachelle VanDeventer of MITA and suppliers agreed that inclusion of these photographs was appropriate and appreciated, citing that the original intent in creating this agreed upon document was for this purpose.
- Chapter 8 Maintenance and Survey Operations: Chapter added. Includes guidance formerly found in Maintenance Work Zone Traffic Control Guidelines and unpublished Michigan Survey Work Zone Traffic Control Guidelines.
- Temporary Sign Design Guidelines: Added to Appendix K.

Work Zone Safety Mobility Manual can be reviewed in its entirety via MDOT's ProjectWise application.

Recommendation(s) – Approve WZSMM in its entirety. Note that Guidance Document 10202, proposed today to the EOC meeting, has been included in this WZSMM update. No

guidance has been included in WZSMM at this time regarding speed reductions of 15 mph for 75 mph posted freeways, an agenda topic from today's EOC meeting.

If these items are all approved, they will be incorporated into this version before going live. If they are declined, adjustments will be made to the document to reflect EOC's positions. If agenda items today are found unfavorable or need further development, we propose addressing these items in subsequent editions of WZSMM; we do not want to delay in posting this manual.

Status – This manual has been reviewed by the following groups and comments addressed, as per our agreed upon CFS Work Zone Unit processes:

- Work Zone Business Team
- Traffic and Safety Statewide Alignment Team
- Members of Safety and Security Administration (Jim Gaus), Maintenance and Operations (Tim Croze) and Traffic Incident Management (Dawn Miller)

*ACTION: Approved with additional revisions to be submitted soon after this meeting.*

12. New Roundabouts at I-75/LaPlaisance Road and I-75/Newport Road Interchanges – Lynne Kirby

Subject/Issue - New Roundabouts at I-75/LaPlaisance Road and I-75/Newport Road interchanges.

Issue Statement - Request EOC approval for new roundabouts.

Major Issue(s) – Bridge replacements are needed at both locations due to condition. Interchange studies were done during bridge scoping that identified roundabouts as the recommended configuration.

Background/History – Roundabouts improve the interchange operations as well as allow a shorter bridge to be constructed and a reduction of the overall interchange footprint which results in lower future maintenance costs. Virtual Public meetings were held for both locations. No significant concerns were raised.

Recommendation(s) – Approval

*ACTION: Approved.*

13. Alternate Pavement Bidding for Design-Bid-Build Project : I-96, Eastbound and Westbound from I-275 to Kent Lake Road, Oakland County – Ryan Mitchell/Rob Marz

*ACTION: Tabled for future EOC meeting.*

#### 14. MDOT Widened Slab Guidance Approval (increase to 14 feet) – Justin Schenkel

Issue(s) – To approve the ‘MDOT Widened Slab Guidance’ as agreed to by MDOT personnel, including those from the central office and regions and MDOT industry partners.

Background – This attached guidance is intended to formalize the MDOT use of concrete pavement widened slabs and improve statewide consistency. MDOT standard concrete pavement longitudinal width is 12 feet. However, if appropriate, MDOT may use a 14-foot widened outside slab (truck lane). The widened slab is intended to reduce stresses and deflections at the outside longitudinal concrete pavement edge caused by vehicle tires running on or near the edge. Widened slabs may also reduce the amount of shoulder maintenance. While widened concrete slabs can be beneficial, they may also be susceptible to longitudinal cracking if the pavement thickness is too thin. Therefore, guidance was drafted to define the pavement and project conditions that are appropriate for the widened outside concrete slab.

It is important to note that this guidance does not apply for HMA pavements. We do not recommend HMA widening and agree to not require it for LCCA.

This guidance was reviewed and accepted by the MDOT Pavement Management team, Region personnel, and MDOT industry partners. All parties were informed that this document will serve as the guidance to be used for future reference.

As noted in the guidance, it is recommended that once approved by the MDOT EOC, all projects that have a plan completion date six months or later from the approval date will be subject to the guidance.

Recommendation(s) – Approval of the ‘MDOT Widened Slab Guidance’ and consequently, the consent to begin work on updating appropriate MDOT literature to incorporate the guidance.

As an addition to the ‘MDOT Widened Slab Guidance’ EOC agenda item, the following clarifies how MDOT currently designs the pavement section for reconstruction projects and how widened Portland Cement Concrete slabs are considered in that design process:

For reconstruction pavement designs, MDOT uses both the AASHTO 1993 and Mechanistic-Empirical (ME) pavement design methodologies. First, for both pavement type alternatives (asphalt and concrete), MDOT creates an initial design for each alternative using the AASHTO 1993 method. Then, MDOT uses the Mechanistic/Empirical (ME) design method to determine the ME recommended pavement thickness. Then, this “unrestricted” ME pavement thickness is limited by (in this order) MDOT minimum thickness standards,  $\pm 1$ ” pavement thickness from AASHTO 1993 to ME results ( $\pm 1$ ” ME protocol), and/or the widened concrete slab thickness reduction (up to 1” if other previously noted restrictions are not met). After these restrictions are applied, these results are considered the “final” designs used for LCCA or alternate pavement bidding purposes.

- Note that MDOT minimum pavement thicknesses for reconstruction are as follows:
  - For HMA, a minimum of three courses are used, with minimum thicknesses of 1.5", 2", and 3" per top course, leveling course, and base course, respectively. Therefore, the total minimum thickness is 6.5".
  - For JPCP, a minimum of 8" and 9" is used for non-freeway and freeways, respectively.
- Note that the  $\pm 1$ " ME protocol was agreed to by the ME oversight committee and the MDOT EOC. This was recommended to minimize the risk of large thickness changes from ME as compared to the AASHTO 1993 method.
- Note that MDOT has not been using the Pavement ME widened slab input. Instead, MDOT reduces the concrete thickness up to 1" (if other restrictions are not met first). When using the ME widened slab input, improvement in pavement performance is exaggerated and unrealistically low distress predictions are reported. This observation is supported by other DOT agencies.
  - This procedure was agreed to so that we could still account for the ME design consideration of improved performance due to the widened slab.

It is important to note that the AASHTO 1993 pavement design method does not natively account for the performance improvement for widened slabs, so if we were to only use AASHTO 1993, then MDOT would not incorporate any thickness reduction due to widened slabs. This is consistent with previous MDOT pavement design practices prior to the implementation of ME.

*ACTION: Approved*



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Carol Aldrich, Secretary  
Engineering Operations Committee

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|                                |                     |                         |
|--------------------------------|---------------------|-------------------------|
| cc: EOC Members                | C. Libiran (MDOT)   | R. Brenke (ACEC)        |
| Meeting Guests                 | R. Lippert (MDOT)   | G. Bukoski (MITA)       |
| Region Engineers (MDOT)        | L. Mester (MDOT)    | D. DeGraaf (MCA)        |
| Assoc. Region Engineers (MDOT) | C. Newell (MDOT)    | C. Mills (APAM)         |
| TSC Managers (MDOT)            | T. Schafer (MDOT)   | D. Needham (MAA)        |
| L. Doyle (MDOT)                | R. Jorgenson (FHWA) | M. Ackerson-Ware (MRPA) |

# **Appendix A**

# WINTER DRIVING SAFETY TIPS



## DON'T BLAME THE WEATHER! DRIVE SLOW ON ICE & SNOW

Most winter driving crashes are not caused by the weather, but by drivers' failure to adjust to road conditions. "Drive slow on ice & snow" is the theme for our winter driving safety program, and our #1 tip for staying safe on wintry roads. Here's why:

- \* Most winter driving crashes can be attributed to drivers going too fast for the roadway conditions. When this happens, drivers can lose control, leave their lane, or even leave the roadway.
- \* On snowy and/or icy roads, it can take up to **ten times longer** to stop your vehicle. Slowing down and allowing more room between your vehicle and the one ahead of you gives you more time to react and brake, thus reducing your crash risk.
- \* Michigan speed limit laws require drivers to move at a speed that is "reasonable and proper" for the road conditions. This means that even if you are driving at or under the posted speed limit, you could still get a speeding ticket if the road conditions make that speed unreasonable for safe driving.
- \* By making adjustments in speed and handling when road conditions are bad, you can take charge of your winter driving safety.
- \* Don't use cruise control on ice and snow. If your car skids, the cruise control will accelerate to maintain a constant speed — spinning your wheels even faster and increasing the chance you will lose control of your vehicle.



## BE PREPARED

Before you go, take the time to prepare your car for safe winter driving.

- \* Keep your car well maintained. Have a mechanic check fluid levels (oil, wiper fluid, antifreeze, etc.), as well as your battery, ignition system, lights, brakes, heater/defroster, wipers and tires.
- \* Remove all snow and ice from your vehicle, especially from all windows, the windshield, mirrors, headlights and taillights. Snow and ice can dim the beams of lights and reduce visibility.
- \* Always keep your gas tank at least half full to avoid fuel line freeze-up.
- \* Check both current and forecasted weather conditions along your route.
- \* Stock your car with winter driving supplies:
  - *Auto Emergency Kit*
  - Flashlight with extra batteries
  - Shovel
  - Snow brush and scraper
  - Booster cables
  - Bag of sand or kitty litter for traction under tires
  - Cell phone charger
  - Bottled water, food, necessary medicine



## FOLLOW THESE WINTER TIRE SAFETY TIPS

**Winter tires** are made of a softer rubber compound than summer or all-season tires, with thin cuts in the tread. This gives them a better grip on the road, which makes them **the safest choice for driving in winter**. In fact, winter tires can help you stop up to 50% faster on snowy or icy roads.

- \* **Regularly check your tire pressure in winter.** Tire pressure drops as temperatures do, so it's important to make sure your tires are adequately inflated.
- \* **Use the penny test to check tire treads.** Insert a penny, Lincoln's head down, into the tread of your tire. If you can see Abe's entire head, there's not enough tread left to drive safely. (Tires should have at least 1/8" of tread for safe driving.)
- \* **Get tires rotated every 5,000 to 8,000 miles** to help them wear more evenly.





## KEEP PEDESTRIANS & PASSENGERS SAFE

Drivers aren't the only ones at greater risk in winter weather.

- \* Stopping distances can be up to 10 times greater on ice and snow, so drive slowly and stay alert for pedestrians, especially at intersections and crosswalks.
- \* Be aware that pedestrians can be obscured by snowbanks, or can be difficult to see in low-light winter weather.
- \* Don't shovel or plow snow into sidewalks. This can force pedestrians to walk in the road.
- \* Make sure you and all your passengers wear their seat belts. In 2017 alone, seat belts saved an estimated 14,955 lives in the U.S. and could have saved an additional 2,549 people — if they had buckled up.
- \* The lap and shoulder belt should be snug across the hips and chest. Never put the shoulder belt behind your back.
- \* Children should be buckled into car seats or booster seats until they are at least 4' 9" tall. Even when they are big enough to use the adult seat belt, they should ride in the back seat until they are 13 years of age or older.  
For car seat guidelines, visit <https://www.nhtsa.gov/equipment/car-seats-and-booster-seats>
- \* Don't dress infants or toddlers in puffy coats or snowsuits. The extra bulk keeps the harness straps from fitting tight enough against baby's chest. Dress your little one in lighter layers to keep the straps snug, then cover them with a blanket or coat.



## DRIVE SAFELY NEAR SNOWPLOWS

When sharing the road with a snowplow, here are ways to stay safe.

- \* Be aware that snowplows move slowly, make wide turns, and stop frequently.
- \* It's illegal in Michigan to pass a snowplow on the right. And while it's not illegal to pass on the left, you should do so with extreme caution.
- \* If you are driving behind a snowplow, maintain 6 to 10 car lengths between your vehicle and the snowplow. If you follow too closely, the driver may not be able to see you. Your vision could also be obstructed by a "snow cloud" created by the plow.
- \* A snowplow is considered an authorized vehicle for purposes of Michigan's Move Over law. If you see a stationary snowplow on the side of the road, you **must reduce your speed** to at least 10 mph slower than the speed limit and move over to an open lane. If this is not possible, slow down and pass, allowing as much room as possible.



## KNOW HOW TO HANDLE EMERGENCIES

Despite all your precautions, you find yourself stopped or stalled on the road. Don't panic. Follow these safety rules:

- \* Stay with your car and don't overexert yourself.
- \* Put bright markers on the antenna or windows and keep the interior dome light turned on.
- \* If you must run your car's engine to keep warm, be certain the exhaust pipe is clear of snow, ice or dirt, and check it periodically. Run the vehicle for only 5-10 minutes each hour and be sure to open the windows slightly for ventilation. Keeping the car running continuously could lead to asphyxiation from carbon monoxide poisoning.

