ENGINEERING OPERATIONS COMMITTEE
MEETING MINUTES
OCTOBER 3, 2019, 9:00 A.M. – 11:00 A.M.
MULTI-MODAL CONFERENCE ROOMS

Present:	Carol Aldrich	Jason Gutting	Brad Wieferich
	Mark Bott	Tony Kratofil	Gorette Yung (phone)
	Matt Chynoweth	Ryan Mitchell	Hal Zweng
	Mark Dionise	Kristin Schuster	
	Mark Geib	Will Thompson (phone)	
Absent:	Gregg Brunner	Rebecca Curtis	Brandy Solak
Guests:	Jason Fossitt	Chelsea Kramer	Kelby Wallace
	Jason Gailitis	Ben Krom	

OLD BUSINESS

1. Approval of the September 13, 2019, Meeting Minutes – Tony Kratofil - *Approved*

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

NEW BUSINESS

1. Work Zone Safety and Mobility Manual Updates – Jason Gutting

   Issue Statement – Revisions to the Work Zone Safety and Mobility Manual (WZSMM).

   Major Issue(s) – The WZSMM has incorporated minor grammatical corrections as well as text updates to the weblinks within the document. Construction Field Services (CFS) has determined that the following items may be considered major changes per the Engineering Operations Committee (EOC) guidance document and therefore require EOC review and approval.

   4.03.03 Road Users – The following paragraph was added to this section:
   - The riding surface is important for the safety of motorcycle riders. Whenever possible, construction operations should be avoided that place motorcycles on grooved pavement, pavement lane edge drops from milled surfaces, rumble strips and unpaved surfaces. If these conditions cannot be avoided, the temporary traffic control plan should include adequate warning signs for these conditions to alert the motorcycle riders. Consideration should also be made for ingress/egress points, where

designs should include the capability of a motorcyclist accessing the roadway perpendicular to differentials in pavement elevations.

4.03.04 Work Zone Crash Reduction Strategies and Mitigations – The existing manual does not have a table for angle crashes, yet this type of crash is listed as one of the five primary crashes in work zones. The following table has been added.

TABLE 4-5: WORK ZONE CRASH REDUCTION STRATEGIES AND TOOLS: ANGLE CRASHES

Work Zone Crash Factors	Crash Reduction Strategy	Crash Reduction Tools
Signal and ITS	Advance warning flashers	• Add advance temporary intersection or Signal Ahead warning signing with flasher
	Review signal head placement and timing	• Ensure correct signal head placement over lanes • Cover or bag any conflicting information • Check signal corridor timing
Geometry	Review turning movements	• Add left turn lanes or limit left turns • Create right turn pocket with devices
	Review intersection and stopping sight distance.	• Ensure construction materials and equipment are not blocking sight distance. • Verify intersection and stopping sight distance
Delineation and Signs	Additional advance intersection signing	• Add lane assignment signs (R3-8 series) (ground mount & overhead) • Add No Left/Right turn signing (R3-1, R3-2) • Add advance intersection (W-2 Series), signal ahead (W3-1), or stop ahead (W3-1), warning signs
	Review travel path	• Work Zone Audit Report (Form 0397) • Verify taper / shift lengths
	Pavement markings & advance warnings	• Temporary stop bars, and crosswalks • Lane assignment arrows on pavement • Temporary rumble strips • Solid temporary pavement markings leading up to stop bars

4.05 Work Zone Law Enforcement – This section is currently under revision and will be updated once completed and brought to EOC. In the interim old information, which is no longer correct, has been removed and a reference to contact the CFS Field Operations Engineer has been added. Once completed this update will be expedited.

6.01.07 Temporary Barriers – The following paragraph was added to this section as a best practice and item to consider.

- Consideration should be given to extend the barrier wall past the work area, both upstream and/or downstream to encompassed materials, equipment and work operations. Worker access to the job site should also be protected when practical. The length of need should be shown or detailed in the internal traffic control plan. Each location should be evaluated to determine the length of need, as a best practice a range of 100 to 300 feet is recommended.

6.01.08 Temporary Signs – The following statement was added:

- The size of signs must follow table 6F-1 Temporary Traffic Control Zone Sign and Plaque Size of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD).

6.01.08.D Innovative Temporary Signing – The following section was added to highlight innovative work zone signing options that exist and can be utilized.

- In areas with limited space or specific geometric features traditional temporary sign may not function ideally so the use of an innovative signs should be evaluated.

1. Concrete Barrier-Mounted Temporary Sign System

In locations with concrete barrier wall and limited space the barrier mounted sign should be considered. The condition of the existing barrier wall should be evaluated during the design phase to verify the condition. In areas with limited shoulder width the size of the sings can be reduced as detailed in table 6F-1 Temporary Traffic Control Zone Sign and Plaque size of the MMUTCD. For more details on this device see the previously approved special provision Concrete Barrier-Mounted Temporary Sign System-12DS812(I160)Rev1.doc

2. Temporary Water Filled Base Sign System

In locations that don't allow for temporary signs to be post driven an alternative to consider is a water filled base sign system. This sign system provides a sturdy base without the need to drive into the ground. Ideal locations are bridge decks or paved shoulders.

This sign system can also be utilized in lieu of type III barricades in locations where there is a high potential for devices to be moved by the motoring public. The next weight of the system is above 400 pounds when filled with water. For more detailed information see the recommended special provision Temporary Water Filled Base Sign System-12RC812-A445-01-06-25-15.pdf

6.01.23 Rolling Road Blocks (section added per request from Dave Morena, FHWA)
A rolling roadblock is a technique used to temporarily slow or stop vehicles in order to provide a gap in traffic in advance of construction activities. Temporarily removing or slowing traffic enables the completion of short-term work where a long-term closure using standard TTC devices is not needed.

A. Work Activities
Location and traffic volumes may require the contractor to perform a rolling roadblock to allow for access of construction vehicles and material delivery. This method should be used during off-peak hours and only when traffic volumes don't allow for ingress and egress into the work site and should be detailed as part of the internal traffic control plan.

B. Construction
Traffic should not be stopped for over fifteen minutes. Additional stoppages should not be conducted until the traffic queue has cleared completely. Traffic queue formations and dispersals should be monitored.

All efforts should be made to conduct all traffic stoppages utilizing law enforcement officials and vehicles. When not available, one construction vehicle per open lane of traffic with a permanently affixed rotating beacon or strobe light should be used. These vehicles should start in their appropriate lanes, beacons on, well in advance of the signing sequence flowing normally with traffic. As they progress through the signing sequence, they should slowly reduce their speed until a full stop is attained at the prescribed stopping point.

Appropriately marked construction vehicles with an amber rotating beacon and conspicuity tape should be used at a minimum. As a best practice a "Pilot Car, Follow Me" sign should be considered. Law enforcement should always be considered the first choice over contractor vehicles if this is to occur at a high frequency during the project.

C. Operations Plan
Before implementing a rolling roadblock for planned work, a meeting with all stakeholders to define responsibilities and ensure the activities for successfully executing a rolling roadblock should be completed. An emergency plan should be developed to handle traffic should unforeseen circumstances occur. Emergency response agencies should be notified of the dates and times of the rolling roadblock. All efforts should be made to inform the public at least 3 days in advance of the roadblock. Dynamic message signs (DMS) or portable changeable message signs (PCMS) should be used to alert the users of the operation and when it will be happening that day including the day and hours. A press release should be issued to radio/television stations, newspapers, the agency's website, and any applicable agency social media sites. A final meeting among stakeholders before executing the rolling roadblock should be held to ensure all comments have been addressed.

For a complete copy of the WZSMM with tracked changes and comments please use the following ProjectWise - WORK ZONE SAFETY MANUAL PW 8-12-2019.docx

pw:\\HCV591PWISPAA01.ngds.state.mi.us:MDOTProjectWise\Documents\System Operations and Management\Work Zone Safety & Mobility\WZSMM Draft\WZSMM Draft 2019 JRV\WORK ZONE SAFETY MANUAL PW 8-12-2019.docx

Background/History – These changes have been reviewed and approved by the Statewide Work Zone Business team. The WZSMM had a major revision in October 2018 and our goal is to update annually to ensure relevant information is in the manual. When approved by EOC a detailed list of changes will be distributed to customers via the work zone gov delivery tool. This material will also be covered during annual work zone trainings.

Recommendation(s) – CFS is requesting approval of the changes to the WZSMM.

Status – New Item.

ACTION: Approved

2. Road Diet – M-50 in Tecumseh – Jason Fossitt

Project Information (if applicable): M-50, city of Tecumseh, Lenawee County project will begin at Pearl Street and continue to Oneidea Street. A public meeting was held June 10th in the city of Tecumseh with MDOT present to observe. M-50 is a non-National Highway System route with an Annual Daily Traffic of 12800.

Route/Location:M-50
Job Number: 208718
Control Section: 46082
Letting Date: 1/8/2021

Issue(s) – Approval of proposed Road Diet.

Background – M-50 through the city of Tecumseh will be cold milled and resurfaced in 2021. MDOT presented an opportunity to the city to convert the existing four-lane section to a three-lane section by restriping the new pavement. The city then completed the checklist and traffic modeling to present to the city council. The council supported the conversion and provided MDOT with a resolution of support. The level of service for the approaches at each of the four intersections studied operate at a level C or better under the existing configuration.

Recommendation(s) – Information purposes only on Road Diet. The results of the proposed 2021 condition analysis indicate that the study area intersections are expected to operate with similar levels of service and delay values as the exiting conditions. All approaches within the study area will operate at a level of service C or better under the new three-lane configuration.

ACTION: Information Only

3. I-94 Elm Road Interchange Reconstruction includes Roundabouts – Jason Fossitt

   Project Information (if applicable): As Part of the I-94 Elm Road interchange reconstruction project the preferred alternative is to construct three-single lane roundabouts. Roundabouts will be constructed for the (I-94 EB Exit/ I-94 EB Entrance/Elm Rd,) (I-94 WB Exit/I-94 WB Entrance/ Elm Road,) and (Elm Road, Seymour Road/Elm/Rosehill.) This interchange work is part of a design build project which includes I-94 mainline reconstruction, replacement of the I-94/US-127 (West Avenue) interchange, and the Lansing Road bridge.

   Route/Location: I-94 at Elm Road
   Job Number: 129153
   Control Section:38101
   Letting Date:

   Issue(s) – The I-94 Elm Road interchange currently provides access to multiple car dealerships, Jacksons prisons, and multiple smaller business. The current configuration causes traffic to back up multiple times during the day causing delay and difficulties for the motoring public. In the current geometry Rosehill/Seymour and the I-94 WB Ramp terminals are in proximity and makes it difficult make a turn from SB Elm onto Seymour Road.

   Background – More traffic has been using this interchange due to the opening of three major car dealers along Seymour Road. Geometric adjustments would prove to be beneficial to improving the operations of this interchange.

   Recommendation(s) – Shift the alignment of Elm Road to the east and construct three roundabouts as shown in the drawing. The drawing also shows moving the tie in points of Rosehill, Seymour, and Elm to the north to create separation from the ramp terminals. MDOT Geometrics analyzed the proposed roundabouts and determined that single lane roundabouts will operate at level of service A for nearly all movements based on traffic 2038 traffic projections.

   ACTION: Approved

4. I-94 at US-127 (West Avenue) Reconstruction with Diverging Diamond– Jason Fossitt

   Project Information (if applicable): Reconstruction of the I-94 at US-127 (West Avenue) Interchange, in Blackman Township, Jackson County. The selected alternative for this interchange is a diverging diamond.

   Route/Location: I-94 at US-127 (West Avenue)
   Job Number: 208524
   Control Section:38101

Issue(s) – Modernize the existing interchange and minimize right of way and environmental impacts

Background –. The I-94 corridor from M-60 east to Sargent Road was previously studied with a Record of Decision signed in 2007. At that time the selected alternative was a cloverleaf interchange with collector distributor was the prefer alternative. MDOT decided to re-study this area to consider different alternatives for this location. With this study, five interchange alternatives were examined: Fly-Through, Grade Separated Diverging Diamond, Diverging Diamond, SPUI, and Full Cloverleaf.

Recommendation(s) – Due to minimal right of way impacts, efficient traffic operations, improved non-motorized connections, lower overall costs, and improved signal operations on West Avenue, MDOT proposes that Alternate #3 an at Grade Diverging Diamond Interchange (DDI). Favorable public comment was provided by Region 2 Planning, I-94 CART Team, and a public meeting. Traffic analysis shows that the DDI signals at this interchange will operate at a level of service B or better.

ACTION: Approved

5. Road Diet for 1,500 Feet of US-31 From Four Lanes to Three Lanes – Mark Bott/Jason Gailitis

Issue Statement – Conversion of 1,500 feet of US-31 from 4 lanes to 3 lanes.

Major Issue(s) – There is approximately 1,500 feet through the community of Atwood that is four lanes (two lanes in each direction). Through traffic vehicles often use the lanes to speed up and pass slower vehicles in this short segment where there are businesses generating turning traffic.

Background/History – 5.76 miles of US-31 from Old Dixie Road northerly to the north Antrim County line (Richardson Road) in Antrim County will be Hot Mixed Asphalt cold milled and resurfaced in 2020 with Capital Preventive Maintenance (CPM) funding. US-31 is primarily two lanes (one lane in each direction) except for approximately 1,500 feet through the community of Atwood which is four lanes (two lanes in each direction). This area is under Banks Township's jurisdiction. There is no crash history in this segment. There are local safety concerns regarding how through traffic uses the lanes. There is local support for the lane reconfiguration.

Recommendation(s) – Restriping the roadway from two lanes in each direction to one lane in each direction with a center-left-turn lane is recommended to avoid vehicles using the lanes for passing and to also provide a left turn lane for traffic outside the that is outside the through lane.

Status – The 2020 CPM cold milling and resurfacing project (JN 204281) that this road diet would be part of is scheduled for the December 2019 letting.

ACTION: Information Only

6. Pavement Selection – M-28 in Alger County – Ben Krom

Route/Location: M-28: from Commercial Street to the RR Tracks, Alger County
Job Number: 126912
Control Section: 02041 & 02042
Letting Date: 2/7/2020

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

The paving industries had no comments on this LCCA.

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 EOC.

The reconstruction alternatives being considered are a Hot Mix Asphalt Pavement (HMA Alt #1) and a Jointed Plain Concrete Pavement (JPCP Alt #2). For both alternatives, the proposed plan grade will be lowered approximately four (4) inches lower than the existing plan grade elevation.

The pavement designs being considered are as follows:

Alternative #1: Reconstruct with Hot Mix Asphalt Pavement
1.5” HMA, 5E3 (PG 58-34), Top Course (mainline)
2” HMA, 4E3 (PG 58-34), Leveling Course (mainline)
3.25” HMA, 3E3 (PG 58-28), Base Course (mainline)
1.5” HMA, 5E03 (PG 58-28), Top Course (shoulders)
2” HMA, 4E03 (PG 58-28), Leveling Course (shoulders)
3.25” HMA, 3E03 (PG 58-28), Base Course (shoulders)
6” Aggregate Base
18” Sand Subbase
6” dia. Subbase Underdrain System
30.75” Total Section Thickness
Present Value Initial Construction Cost $222,925/lane-mile
Present Value Initial User Cost $16,566/lane-mile
Present Value Maintenance Cost $119,591/lane-mile
Equivalent Uniform Annual Cost (EUAC) $13,875/lane-mile

Alternative #2: Reconstruct with Jointed Plain Concrete Pavement
8" Non-Reinforced Concrete Pavement, P1 Modified, w/ 12' joint spacing
6" Open Graded Drainage Course
Geotextile Separator
10" Sand Subbase
6" dia. Open-Graded Underdrain System
24" Total Thickness
Present Value Initial Construction Cost $424,257/lane-mile
Present Value Initial User Cost $16,444/lane-mile
Present Value Maintenance Cost $117,578/lane-mile
Present Value Remaining Life Value -$16,251/lane-mile
Equivalent Uniform Annual Cost (EUAC) $20,945/lane-mile

The pavement designs for both alternatives are based on the 1993 American Association of State Highway and Transportation Officials (AASHTO) "Guide for Design of Pavement Structures", using the AASHTO pavement software DARWin Version 3.1, 2004, and the 2015 AASHTO "Mechanistic-Empirical Pavement Design Guide, 2nd Edition", using the software AASHTOWare Pavement ME Design 2.3, 2016. The Equivalent Uniform Annual Cost calculation is based on the revised pavement selection process as approved by the EOC on June 3, 1999. The estimated construction costs are based on historical averages from similar projects. User costs are calculated using MDOT's Construction Congestion Cost model, which was developed by the University of Michigan.

Conclusion
Pavement selection was determined using the procedures outlined in the MDOT *Pavement Selection Manual.* Department policy requires that the pavement alternative with the lowest EUAC, **Alternative #1: Reconstruct with Hot Mix Asphalt Pavement,** be selected. Final pavement selection requires approval by the Engineering Operations Committee.

ACTION: Approved

7. Pavement Selection – M-3 in Macomb County – Ben Krom

Route/Location: M-3: from 11 Mile Road to 14 Mile Road, Macomb County
Job Number: 85541
Control Section: 50051
Letting Date: 12/4/2020

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

The paving industries had no comments on this LCCA.

Background/History – Pavement selection was determined using the procedures out-lined in the MDOT Pavement Selection Manual. Department Policy requires that the pavement

alternate with the lowest EUAC be selected. Final pavement selection re-quires approval by the Engineering Operations Committee.

The reconstruction alternatives being considered are a Hot Mix Asphalt Pavement (HMA Alt #1) and a Jointed Plain Concrete Pavement (JPCP Alt #2). For both alternatives, the existing subbase is not suitable for retention and will be removed and replaced. The pavement designs being considered are as follows:

Alternative #1: Reconstruct with Hot Mix Asphalt Pavement (Mainline & Shoulders)
1.5" HMA, 5E3, Top Course (PG 64-22)
2" HMA, 4E3, Leveling Course (PG 64-22)
3.75" HMA, 3E3, Base Course (PG 58-22)
16" Open-Graded Drainage Course
Geotextile Separator
8" Sand Subbase
6" dia. Open-Graded Underdrain System
31.25" Total Section Thickness
Present Value Initial Construction Cost $364,521/lane-mile
Present Value Temporary Pavement Cost $60,572/lane-mile
Present Value Initial User Cost $439,088/lane-mile
Present Value Maintenance Cost $127,090/lane-mile
Present Value Remaining Life Value -$9,709/lane-mile
Equivalent Uniform Annual Cost (EUAC) $35,486/lane-mile
Alternative #2: Reconstruct with Jointed Plain Concrete Pavement (Mainline & Shoulders)
8.0" Non-Reinforced Conc Pavt, P1 Modified, w/ 12' jt spacing
16" Open Graded Drainage Course
Geotextile Separator
6" dia. Open-Graded Underdrain System
24" Total Thickness
Present Value Initial Construction Cost $431,213/lane-mile
Present Value Temporary Pavement Cost $71,020/lane-mile
Present Value Initial User Cost $478,981/lane-mile
Present Value Maintenance Cost $131,050/lane-mile
Equivalent Uniform Annual Cost (EUAC) $40,211/lane-mile

The pavement designs for both alternatives are based on the 1993 AASHTO "Guide for Design of Pavement Structures", using the AASHTO pavement software DARWin Version 3.1, 2004, and the 2015 AASHTO "Mechanistic-Empirical Pavement Design Guide, 2nd Edition", using the software AASHTOWare Pavement ME Design 2.3, 2016. The Equivalent Uniform Annual Cost calculation is based on the revised pavement selection process as approved by the EOC on June 3, 1999.

The estimated construction costs are based on historical averages from similar projects. User costs are calculated using MDOT's Construction Congestion Cost model, which was developed by the University of Michigan.

Conclusion

Pavement selection was determined using the procedures outlined in the MDOT *Pavement Selection Manual.* Department policy requires that the pavement alternative with the lowest EUAC, **Alternative #1: Reconstruct with Hot Mix Asphalt Pavement,** be selected. Final pavement selection requires approval by the Engineering Operations Committee.

ACTION: Approved

Carol Aldrich, Secretary
Engineering Operations Committee

RA:lrb

cc:
EOC Members
Meeting Guests
P. Ajegba
L. Mester
Region Engineers
Assoc. Region Engineers
TSC Managers
M. DeLong
D. Jones
C. Libiran
R. Jorgenson (FHWA)
R. Brenke (ACEC Michigan)
G. Bukoski (MITA)
D. DeGraaf (MCA)
J. Becsey (APAM)
D. Needham (MAA)
M. Ackerson-Ware (MRPA)