



**ENGINEERING OPERATIONS COMMITTEE  
MEETING MINUTES  
May 28, 2020, 9:00 A.M. – 11:00 A.M.  
VIA TEAMS**

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Present: Carol Aldrich                      Mark Dionise                      Ryan Mitchell  
          Mark Bott                              Mark Geib                         Kristin Schuster  
          Gregg Brunner                        Jason Gutting                    Gorette Yung  
          Matt Chynoweth                        Tony Kratofil                     Hal Zweng

Absent: Rebecca Curtis                    Will Thompson  
          Brandy Solak                         Brad Wieferich

Guests: Ben Krom                         Rick Liptak

**OLD BUSINESS**

1. Approval of the April 30, 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. October 1, 2020 goal set for new materials summary and flow chart completion.*

NEW BUSINESS

## 1. Safety Topic: Ladder Safety – Jason Gutting

*ACTION: Information Only*

## 2. M-37 Roundabout in Traverse City – Mark Bott/Rick Liptak

Issue Statement – The Traverse City Transportation Service Center (TSC) will be pursuing plan development and construction of a roundabout at the intersection of M-37 and Blair Townhall Road, and another roundabout at the intersection of M-37 and Vance Road as part of JN 128553, 129932, and 207744 in Grand Traverse County, south of Traverse City.

Major Issue(s) – These existing intersection configurations force traffic to enter a two-lane highway with a 55mph posted speed limit and an annual average daily traffic over 17,000 from a stop condition. The traffic backs up significantly down the side roads and drivers become impatient, leading to more aggressive driving behavior and as a result more crashes. The TSC has taken available mitigation steps including installation of overhead flashers, improved signage, and has worked with the Blair Township to improve lighting. Even with these improvements, crashes and complaints have continued.

Background/History – This location south of Traverse City has seen expansive single-family home development over the last 20 years. These residential developments have created an increase to side-road traffic accessing M-37. Two of the primary access points to M-37 in this area are Blair Townhall Road and Vance Road. Both of these intersections have seen a significant increase in moderate to severe crashes over the same period. There is currently no evidence of pedestrian usage at either intersection. The township has no future plan to develop pedestrian infrastructure at these intersections. The township has passed a resolution of support for the roundabout and to maintain the lighting system in the future.

Recommendation(s) – The Traverse City TSC proposes continued plan development and construction of the two roundabouts as part of JN 128553, 129932 and 207744.

Status – Preliminary plans for the project and these roundabouts are currently under review, and the project is scheduled for 2021 construction.

*ACTION: Approved*

## 3. US-2 Life Cycle Cost Analysis (LCCA) – Ben Krom

Subject/Issue: Pavement Selection

Route/Location: US-2: From Powder Mill Creek to Old US-2, Gogebic County

Job Number: 109499

Control Section: 27021  
Letting Date: 12/4/2020

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 Equivalent Uniform Annual Cost (EUAC) be selected. Final pavement selection requires approval by the Engineering Operations Committee (EOC).

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

**Alternative #1: Reconstruct with Hot Mix Asphalt Pavement (Mainline)**

1.5" HMA, 5E3, Top Course  
2" HMA, 4E3, Leveling Course  
3.5" HMA, 3E3, Base Course  
6" Aggregate Base  
18" Sand Subbase  
6" dia. Subbase Underdrain System  
31" Total Section Thickness

- ME pavement design

**Alternative #1: Reconstruct with Hot Mix Asphalt Pavement (Shoulders)**

1.5" HMA, 5E03, Top Course  
2" HMA, 4E03, Leveling Course  
9.5" Aggregate Base  
18" Sand Subbase  
6" dia. Subbase Underdrain System  
31" Total Section Thickness

- ME pavement design

Present Value Initial Construction Cost \$281,624/lane-mile

Present Value Initial User Cost \$18,539/lane-mile

Present Value Maintenance Cost \$127,605/lane-mile

Present Value Remaining Life Value -\$8,843/lane-mile

**Equivalent Uniform Annual Cost (EUAC) \$13,914/lane-mile**

**Alternative #2: Reconstruct with Jointed Plain Concrete Pavement (Mainline)**

8" Non-Reinforced Conc Pavt, High Performance, w/ 12' jt spacing  
6" Open Graded Drainage Course  
Geotextile Separator

10" Sand Subbase  
6" dia. Open-Graded Underdrain System  
24" Total Thickness

- ME pavement design at MDOT minimum thickness

**Alternative #2: Reconstruct with Jointed Plain Concrete Pavement (Shoulders)**

8-5" Tapered Non-Reinforced Conc Pavt, High Performance, w/ 12' jt spacing  
6-9" Tapered Open Graded Drainage Course  
Geotextile Separator  
10" Sand Subbase  
6" dia. Open-Graded Underdrain System  
24" Total Thickness

- ME pavement design at MDOT minimum thickness

Present Value Initial Construction Cost \$408,742/lane-mile

Present Value Initial User Cost \$27,276/lane-mile

Present Value Maintenance Cost \$134,504/lane-mile

**Equivalent Uniform Annual Cost (EUAC) \$18,949/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 EOC.

*ACTION: Approved*

#### 4. I-196 Life Cycle Cost Analysis – Ben Krom

Subject/Issue: Pavement Selection

Route/Location: I-196: from Fuller Avenue to Maryland Avenue, Kent County

Job Number: 206976

Control Section: 41027

Letting Date: 10/2/2020

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

Major Issue(s) – The Michigan Concrete Association (MCA) commented on this LCCA, stating that the pavement designs and analysis method followed were in conflict with existing MDOT policy and the life-cycle legislation. Working with staff within our unit, as well as Grand Region staff, MCA's comments were reviewed, and a response was sent specifically describing how MDOT policy and the life-cycle legislation was followed. No further correspondence has been received to date.

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.

##### **Alternative #1a: Reconstruct I-196 with Hot Mix Asphalt Pavement**

###### **•ME pavement design**

1.5" HMA, 5E10, Top Course (mainline)

3" HMA, 3E10, Leveling Course (mainline)

3" HMA, 3E10, Base Course (mainline)

1.5" HMA, 5E03, Top Course (shoulders)

3" HMA, 3E03, Leveling Course (shoulders)

3" HMA, 3E03, Base Course (shoulders)

6" Aggregate Base

18" Sand Subbase

6" dia. Subbase Underdrain System

31.5" Total Section Thickness

##### **Alternative #1b: Reconstruct Ramps with Hot Mix Asphalt Pavement**

###### **•AASHTO 1993 design at MDOT minimum thickness**

1.5" HMA, 5E03, Top Course

2" HMA, 4E03, Leveling Course

3" HMA, 3E03, Base Course

6" Aggregate Base

18" Sand Subbase

6" dia. Subbase Underdrain System  
30.5" Total Section Thickness

Present Value Initial Construction Cost \$459,860/lane-mile  
Present Value Initial User Cost \$103,370/lane-mile  
Present Value Maintenance Cost \$118,376/lane-mile  
Present Value Remaining Life Value -\$10,672/lane-mile  
**Equivalent Uniform Annual Cost (EUAC) \$22,285/lane-mile**

**Alternative #2a: Reconstruct I-196 with Jointed Plain Concrete Pavement**

•AASHTO 1993 design at MDOT minimum thickness  
9" Non-Reinforced Concrete Pavement, P1 Modified, w/ 14' joint spacing  
6" Open Graded Drainage Course  
Geotextile Separator  
10" Sand Subbase  
6" dia. Open-Graded Underdrain System  
25" Total Thickness

**Alternative #2b: Reconstruct Ramps with Jointed Plain Concrete Pavement**

•AASHTO 1993 design at MDOT minimum thickness  
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 \$607,731/lane-mile  
Present Value Initial User Cost \$103,468/lane-mile  
Present Value Maintenance Cost \$122,482/lane-mile  
**Equivalent Uniform Annual Cost (EUAC) \$27,690/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 EOC.

*ACTION: Approved*

#### 5. Policy for Bridge Closures During Construction – Matt Chynoweth

Issue Statement – Creating a clear and aligned policy as to the evaluation of structural issues during bridge construction, the authority to close, and follow-up activities required to analyze and mitigate the issue.

Major Issue(s) – As part of the National Transportation Safety Board final report on the Florida International University (FIU) bridge collapse, the following recommendation was made:

**TO THE FLORIDA DEPARTMENT OF TRANSPORTATION:** Revise local agency program agreements to specify that when structural cracks are initially detected during bridge construction, the engineer of record, construction engineering inspector, design–build firm, or local agency that owns or is responsible for the bridge construction must immediately close the bridge to construction personnel and close the road underneath; fully support the entire bridge weight using construction techniques that do not require placing workers on or directly under the bridge during installation; and restrict all pedestrian, vehicular, and construction traffic on the bridge until the complete support is in place and inspected.

MDOT will make this policy to comply with the recommendation, and recommend local agencies adopt this as well.

Background/History – The FIU pedestrian bridge collapse was a result of a structural failure, which lead to catastrophic collapse. There were many warnings as structural elements showed signs of progressive failure, however, the evaluation, focus on schedule, and lack of clear authority as to who could/should make the call to close the bridge/roadway below, resulted in deaths and injuries at the time of collapse. This policy memo is an attempt to address this situation, should a similar situation present itself on Trunkline bridge projects.

Recommendation(s) – Approval of the memo as MDOT policy on all trunkline bridge construction projects, and outreach to the locals for adoption as well.

Status – Reviewed by Bureau of Bridges and Structures, Construction Operations, and Attorney General’s office. All comments incorporated.

*ACTION: Approved with minor edits as discussed during the EOC meeting.*

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Carol Aldrich, Secretary  
Engineering Operations Committee



RA:lrh

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)