



**ENGINEERING OPERATIONS COMMITTEE  
MEETING MINUTES  
DECEMBER 1, 2016 – 9:00 A.M.  
MULTI-MODAL CONFERENCE ROOM**

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Present: M. Van Port Fleet R. Ranck J. Gutting  
B. Wieferich M. Geib S. Bower  
K. Schuster M. Sweeney H. Zweng  
T. Marshall (FHWA)

Absent: M. Bott R. VanPortfliet C. Rogers

Guests: B. Krom L. Strzalka M. Shulick

OLD BUSINESS

1. Approval of the November 3, 2016 Meeting Minutes – M. Van Port Fleet

*ACTION: Approved*

NEW BUSINESS

1. Pavement Selection US-10 – B. Krom

Route/Location: US-10: US-127 to east/Leaton Road, Clare & Gladwin County

Job Number: 123643

Control Section: 18023, 37031, 37032

Letting Date: 12/2017

Rehabilitate US-10: CS 18023: BMP 0.000 to MP 1.297 CS 37032: MP 0.000 to EMP 1.630

Reconstruct US-10 BR ramps: CS 37031: BMP 1.444 to EMP 2.116

Department policy requires that Life Cycle Cost Analysis (LCCA) be used to determine the lowest cost pavement design alternative following the procedures outlined in the MDOT Pavement Design and Selection Manual. Final pavement selection requires approval by the Engineering Operations Committee.

The US-10 rehabilitation (rehab) alternatives being considered are a Hot Mix Asphalt Pavement over Rubblized Concrete (HMA Alt #1a) and an Unbonded Jointed Plain Concrete Pavement Overlay (JPCP Alt #2a). The US-10 reconstruction alternatives being considered are a Hot Mix Asphalt Pavement (HMA Alt #1b) and a Jointed Plain Concrete Pavement (JPCP Alt #2b).

The US-10 BR reconstruction (reconst) alternatives being considered are a Hot Mix Asphalt Pavement (HMA Alt #1c) and a Jointed Plain Concrete Pavement (JPCP Alt #2c). The pavement designs being considered are as follows:

Alternative #1a: Rehab US-10 with HMA Pavt over Rubblized Concrete (~70% of project)

1.5"	HMA, 5E10, Top Course (mainline & inside shoulder)	
2"	HMA, 4E10, Leveling Course (mainline & inside shoulder)	
3"	HMA, 3E10, Base Course (mainline & inside shoulder)	
9"	Rubblized Concrete (mainline)	
	Existing Aggregate Base & Sand Subbase	
1.5"	HMA, 5E03, Top Course (outside shoulder)	
2"	HMA, 4E03, Leveling Course (outside shoulder)	
3"	HMA, 3E03, Base Course (outside shoulder)	
6"	Aggregate Base (outside & inside shoulders)	
	PDS Underdrain System	
15.5"	Total Section Thickness	
	Present Value Initial Construction Cost	\$294,564/lane-mile
	Present Value Initial User Cost	\$16,162/lane-mile
	Present Value Maintenance Cost	\$117,400/lane-mile
	Alt #1a Equivalent Uniform Annual Cost (EUAC)	\$20,007/lane-mile

Alternative #1b: Reconst US-10 with HMA Pavement (~23% of project)

1.5"	HMA, 5E10, Top Course (mainline & inside shoulder)	
3"	HMA, 3E10, Leveling Course (mainline & inside shoulder)	
3"	HMA, 3E10, Base Course (mainline & inside shoulder)	
1.5"	HMA, 5E03, Top Course (outside shoulder)	
3"	HMA, 3E03, Leveling Course (outside shoulder)	
3"	HMA, 3E03, Base Course (outside shoulder)	
6"	Aggregate Base	
18"	Sand Subbase	
6" dia.	Subbase Underdrain System	
31.5"	Total Section Thickness	

Alternative #1c: Reconst US-10 BR Ramps with HMA Pavement (~7% of project)

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	\$461,959/lane-mile
	Present Value Initial User Cost	\$59,273/lane-mile
	Present Value Maintenance Cost	\$113,379/lane-mile
	Alt #1b/1c Equivalent Uniform Annual Cost (EUAC)	\$24,522/lane-mile

Alternative 1

	Equivalent Uniform Annual Cost (EUAC)	\$21,379/lane-mile
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Alternative #2a: Rehab US-10 w/ Unbonded Jointed Plain Conc. Overlay (~70% of project)

6"	Non-Reinforced Concrete Pavement, P1 Modified, with 12' joint spacing
1"	HMA Separator Layer (mainline)
9"	Repaired JRCF (mainline)
	Existing Base & Subbase
6"	Open Graded Drainage Course (outside & inside shoulders)
	Geotextile Separator (outside & inside shoulders)
6" dia.	Open-Graded Underdrain System
16"	Total Thickness

Present Value Initial Construction Cost	\$379,854/lane-mile
Present Value Initial User Cost	\$18,978/lane-mile
Present Value Maintenance Cost	\$50,607/lane-mile
Alt #2a Equivalent Uniform Annual Cost (EUAC)	\$21,691/lane-mile

Alternative #2b: Reconst US-10 w/ Jointed Plain Concrete Pavement (~23% of project)

9"	Non-Reinforced Concrete Pavement, P1 Modified, with 14' joint spacing
6"	Open Graded Drainage Course
	Geotextile Separator
10"	Sand Subbase
6" dia.	Open-Graded Underdrain System
25"	Total Thickness

Alternative #2c: Reconst US-10 BR Ramps w/ Jointed Plain Conc. Pavement (~7% of project)

8"	Non-Reinforced Concrete Pavement, P1 Modified, with 14' 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	\$559,785/lane-mile
Present Value Initial User Cost	\$59,916/lane-mile
Present Value Maintenance Cost	\$111,887/lane-mile
Alt #2b/2c Equivalent Uniform Annual Cost (EUAC)	\$27,626/lane-mile

Alternative #2

Equivalent Uniform Annual Cost (EUAC)	\$23,495/lane-mile
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Pavement designs are based on the 1993 AASHTO "Guide for Design of Pavement Structures" and the AASHTO pavement design software, DARWin Version 3.1, 2004.

The Equivalent Uniform Annual Cost calculation is based on the pavement selection process as approved by the EOC on June 3, 1999. Construction costs are derived from historical

averages on similar projects while user costs are calculated using the MDOT Construction Congestion Cost model.

*ACTION: EOC approves the selection of Alternative #1, Reconstruct and Rehabilitate with Hot Mix Asphalt Pavement, which has the lowest life cycle cost.*

2. Trunk Line/Local Funding Participation Technical Agenda – L. Strzalka, M. Shulick

EOC, at the April, 2016 meeting, approved the formation of a technical agenda team to develop and recommend protocols and procedures for the delivery of projects that utilize a combination of state trunk line funds with local agency infrastructure funds. The team provided an update and EOC provided comments on the proposed draft documents.

*ACTION: EOC directs the Technical Agenda Team to revise the draft documents, as directed, and provide a formal recommendation to EOC at a future meeting.*

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Steven Bower, Secretary  
Engineering Operations Committee

RA:SB

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