



Calendar Year 2015 Report on

Life-Cycle Cost Analysis

January 2016



Prepared by

The Minnesota Department of Transportation
395 John Ireland Boulevard
Saint Paul, Minnesota 55155-1899

Phone: 651-296-3000

Toll-Free: 1-800-657-3774

TTY, Voice or ASCII: 1-800-627-3529

To request this document in an alternative format

Please call 651-366-4718 or 1-800-657-3774 (Greater Minnesota). You may also send an email to ADArequest.dot@state.mn.us.

The cost of preparing this report is under \$5,000.

Contents

Contents	3
Legislative Request.....	4
Life-Cycle Cost Analysis Report.....	5
Implementation.....	5
Results	5
Discussion.....	6
Conclusion.....	6
Appendix A: Summary of LCCA Results.....	7-10
Appendix B: Copies of LCCAs.....	11-51
Appendix C: Copies of LCCA Exceptions	52-55

Legislative Request

This report is required by [Minn. Stat. 174.185](#), which requires a life-cycle cost analysis for every project in the reconditioning, resurfacing and road repair funding categories constructed after July 1, 2011. The LCCA is a comparison of life-cycle costs among competing paving materials using equal design lives and equal comparison periods. Documentation required by the statute includes:

- Lowest life-cycle cost
- Alternatives considered
- Chosen strategy
- Documented justification, if the chosen strategy is not the low cost

174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

Subd. 1. Definitions.

For the purposes of this section, the following definitions apply.

(a) "Life-cycle cost" is the sum of the cost of the initial pavement project and all anticipated costs for maintenance, repair, and resurfacing over the life of the pavement. Anticipated costs must be based on Minnesota's actual or reasonably projected maintenance, repair, and resurfacing schedules, and costs determined by the Department of Transportation district personnel based upon recently awarded local projects and experience with local material costs.

(b) "Life-cycle cost analysis" is a comparison of life-cycle costs among competing paving materials using equal design lives and equal comparison periods.

Subd. 2. Required analysis.

For each project in the reconditioning, resurfacing and road repair funding categories, the commissioner shall perform a life-cycle cost analysis and shall document the lowest life-cycle costs and all alternatives considered. The commissioner shall document the chosen pavement strategy and, if the lowest life cycle is not selected, document the justification for the chosen strategy. A life-cycle cost analysis is required for projects to be constructed after July 1, 2011. For projects to be constructed prior to July 1, 2011, when feasible, the department will use its best efforts to perform life-cycle cost analyses.

Subd. 3. Report.

The commissioner shall report annually to the chairs and ranking minority members of the senate and house of representatives committees with jurisdiction over transportation finance beginning on January 1, 2012, the results of the analyses required in subdivision 2.

Life-Cycle Cost Analysis Report

Implementation

[Minn. Stat. 174.185](#) requires a life-cycle cost analysis for every project in the reconditioning, resurfacing and road repair funding categories constructed after July 1, 2011.

The Minnesota Department of Transportation first implemented a life-cycle cost analysis process for roadway rehabilitation projects in 1999. The LCCA process was modified in 2010 to meet the specific requirements of legislation approved in 2008 and was presented in [Technical Memorandum 10-04-MAT-01](#). After the technical memorandum expired, the LCCA process, with some modifications, was incorporated into the [MnDOT Pavement Design Manual](#) which went into effect October 31st, 2014.

The LCCA process, which is consistent with Federal Highway Administration guidelines, is performed on all pavement projects regardless of funding category, but only the results of projects in the reconditioning, resurfacing and road repair funding categories are included in this report. The LCCA process limits the requirement to perform a LCCA to projects with more than 60,000 square yards of pavement (formerly 30,000 square yards in the technical memorandum) and to projects that include placing more than two-inch thickness of pavement material. Thin overlays (two inches or less) are considered short-term preventive maintenance and do not have a viable concrete alternative with an equal design life.

The LCCA process requires the inclusion of at least one Portland cement concrete and one hot-mix asphalt alternate with equal design lives. To best determine the most cost effective design, the LCCA may include additional alternatives with other design lives.

Technical Memorandum 10-04-MAT-01 was superseded by the updated Pavement Design Manual when it was signed on October 31st, 2014; however, many LCCAs for projects constructed this year were already completed and this report will follow the LCCA procedure that was in-effect at the time of the completion of each project's LCCA.

Results

In 2015, 33 construction projects were in the reconditioning, resurfacing and road repair funding categories and required an LCCA according to Technical Memorandum 10-04-MAT-01 or the MnDOT Pavement Design Manual. An LCCA was not submitted for one project (SP 3280-126). It was a special design-build project where the budget was fixed but the length was not. The LCCA of another project (SP 4812-86) did not have hot-mix asphalt and Portland cement concrete alternates with equal design lives because minimum pavement thickness requirements did not allow designs with equal lives to be developed.

The results of the 32 LCCAs are as follows:

- Hot-mix asphalt was the low-cost option for 26 construction projects.
- Portland cement concrete was the low-cost option for 6 construction projects.
- Four projects used the alternate bidding process to select the pavement option to construct.
- Twenty-five projects selected the low-cost option for construction.
- Three projects selected an option other than the low-cost option for construction. Documented justification for selecting other than the low-cost option is provided for these projects.

A table of LCCA results and copies of the LCCAs submitted by MnDOT districts is attached in Appendix A and Appendix B.

Discussion

Hot-mix asphalt is most often the low-cost option in the submitted LCCAs. Portland cement concrete options usually have a greater initial cost than hot-mix asphalt, but become competitive by having lower maintenance costs over the life of the pavement. However, the relatively short design lives of these rehabilitation-type projects do not allow Portland cement concrete options to exploit this relative advantage. Portland cement concrete options with longer design lives than hot-mix asphalt alternates are more competitive than the Portland cement concrete options with the equal design lives required by the statute.

Recently, procedures have been developed to implement two new Portland cement concrete pavement design programs. These new programs have resulted in substantially thinner pavement designs which reduce the initial cost of constructing Portland cement concrete pavements and increase competitiveness. In addition, a research project has been started to develop a new procedure to design Portland cement concrete pavements that are built on top of existing Portland cement concrete pavements.

To create competition and to get the most cost-effective pavement, MnDOT continues to use the alternate bidding process on projects that are likely to have competitive hot-mix asphalt and Portland cement concrete options. A LCCA is still performed but the option constructed is selected through the alternate bidding process.

The alternate bidding process is similar to using a LCCA to determine the low-cost option. However, instead of using an estimate for the initial cost of an option, alternate bidding uses actual bid prices. The process is as follows:

1. MnDOT lets a project with two options, one hot-mix asphalt and one Portland cement concrete.
2. MnDOT calculates a maintenance factor. This is the difference between the maintenance costs of the two options.
3. Each contractor bids on either of the two options.
4. MnDOT adjusts the bids by adding the maintenance factor to the bids of the option with the greater maintenance costs.
5. MnDOT selects the bid with the lowest adjusted bid.

Conclusion

MnDOT implemented the requirements of [Minn. Stat. 174.185](#) and has provided the required results in this report. MnDOT will continue to work to ensure that all future projects meet the requirements of the legislation.

In addition, MnDOT is innovating new methods to design and select the most cost-effective pavement structure. Innovations include new pavement design procedures and refining the alternate bidding process to allow bidders of both pavement materials to bid on a project.

Appendix A: Summary of LCCA Results

State Project Number (SP#)	Existing Pavement Type	Exception for low-cost option?	Design Life (in years)	Option Description	Present Worth / Roadway Mile	Optional Material (1)	Selected Option (2)	Alternate Bid? (3)
1002-101	HMA	No	20	PCC Overlay	\$611,229.00	PCC		Yes
			20	HMA on SFDR	\$773,314.00	HMA	X	
			35	PCC Overlay	\$670,764.00	PCC	X	
			35	PCC Overlay	\$629,668.00	PCC		
1120-55	HMA	No	15	HMA Overlay	\$380,465.00	HMA	X	No
		20	HMA on FDR	\$505,928.00	HMA			
		20	PCC Overlay	\$567,973.00	PCC			
1404-17	HMA	No	15	HMA Overlay	\$410,037.00	HMA	X	No
			15	PCC Overlay	\$644,988.00	PCC		
2404-41	PCC	No	15	HMA Overlay	\$483,822.00	HMA	X	No
		20	New PCC	\$1,096,725.00	PCC			
		20	New HMA	\$1,010,299.00	PCC			
2505-53	PCC	No	17	HMA Overlay	\$325,427.00	HMA	X	No
			20	PCC Overlay	\$553,894.00	PCC		
			20	HMA Overlay	\$372,655.00	HMA		
2613-18	PCC	No	17	HMA Overlay	\$347,451.00	HMA	X	No
		17	PCC Overlay	\$701,355.00	PCC			
2733-89	HMA/PCC	No	14	HMA Overlay	\$1,204,443.00	HMA	X	No
			20	New HMA	\$1,798,785.00	HMA		
			20	New PCC	\$1,690,203.00	PCC		
			35	New PCC	\$1,632,822.00	PCC		
3115-71	HMA	No	20	HMA on FDR	\$462,830.00	HMA	X	No
		20	PCC Overlay	\$599,000.00	PCC			
		20	HMA Overlay	\$329,387.00	HMA			
3606-57	HMA	No	15	HMA Overlay	\$4,893,566.00	HMA	X	No
			20	New PCC	\$11,517,529.00	PCC		
			20	HMA on FDR	\$6,944,829.00	HMA		
Note: Present Worth is for the entire length of the project								
3608-49	HMA	No	20	New PCC	\$463,863.00	PCC	X	No
		20	New HMA	\$482,232.00	HMA			
		20	HMA Overlay	\$382,915.00	HMA			
		35	New PCC	\$445,661.00	PCC			
4303-89	HMA	Yes	14	HMA Overlay	\$466,348.00	HMA	X	No
			20	PCC Overlay	\$413,494.00	PCC		
			20	HMA Overlay	\$739,134.00	HMA		
4402-19	HMA	No	20	HMA Overlay	\$474,540.00	HMA	X	No
		20	New HMA	\$797,265.00	HMA			
		20	PCC Overlay	\$540,497.00	PCC			
		35	New PCC	\$1,029,378.00	PCC			
4503-14	HMA	No	20	HMA Overlay	\$446,917.00	HMA	X	Yes
			20	PCC Overlay	\$611,699.00	PCC		
			20	HMA on FDR	\$396,250.00	HMA		
			35	PCC Overlay	\$483,016.00	PCC		
			35	PCC on FDR	\$493,293.00	PCC		

State Project Number (SP#)	Existing Pavement Type	Exception for low-cost option?	Design Life (in years)	Option Description	Present Worth / Roadway Mile	Optional Material (1)	Selected Option (2)	Alternate Bid? (3)
4812-84	HMA	No	13	HMA Overlay	\$6,229,904.00	HMA	X	No
			20	PCC Overlay	\$8,075,567.00	PCC		
			20	HMA on FDR	\$7,518,287.00	HMA		
Note: Present Worth is for the entire length of the project								
4812-86	PCC	No	20	New HMA	\$1,104,002.00	HMA	X	Yes
			35	New PCC	\$1,107,241.00	PCC	X	
			35	New PCC	\$1,183,868.00	PCC		
5007-32	HMA	No	15	HMA Overlay	\$441,579.00	HMA	X	No
			20	HMA Overlay	\$502,180.00	HMA		
			20	PCC Overlay	\$548,609.00	PCC		
5104-39	HMA	No	14	HMA Overlay	\$422,610.00	HMA	X	No
			20	PCC Overlay	\$594,769.00	PCC		
			20	New HMA	\$848,255.00	HMA		
			35	PCC Overlay	\$698,608.00	PCC		
5211-59	HMA	No	20	HMA on FDR	\$837,524.00	HMA	X	No
			20	New HMA	\$1,269,705.00	HMA		
			20	PCC Overlay	\$681,791.00	PCC		
			35	New PCC	\$1,227,032.00	PCC		
			35	PCC Overlay	\$619,356.00	PCC		
5309-10	HMA	No	15	HMA Overlay	\$596,121.00	HMA		Yes
			20	HMA on FDR	\$554,589.00	HMA	X	
			20	PCC Overlay	\$473,413.00	PCC	X	
			35	PCC Overlay	\$584,745.00	PCC		
5503-45	HMA	No	15	HMA Overlay	\$400,293.00	HMA	X	No
			20	HMA Overlay	\$405,702.00	HMA		
			20	PCC Overlay	\$506,648.00	PCC		
5506-22	PCC	No	17	HMA Overlay	\$325,427.00	HMA	X	No
			20	PCC Overlay	\$553,894.00	PCC		
			20	HMA Overlay	\$372,655.00	HMA		
5811-12	HMA	No	20	HMA on SFDR	\$581,001.00	HMA	X	No
			20	PCC Overlay	\$665,264.00	PCC		
			35	New PCC	\$731,563.00	PCC		
5880-192	PCC	No	20	HMA Overlay	\$297,144.00	HMA	X	No
			35	New PCC	\$653,766.00	PCC		
			20	PCC Overlay	\$686,483.00	PCC		
			20	New HMA	\$945,169.00	HMA		
6005-61	HMA	Yes	20	PCC Overlay	\$863,234.00	PCC	X	No
			20	PCC Overlay	\$630,881.00	PCC		
			20	HMA on FDR	\$642,132.00	HMA		
			35	PCC Overlay	\$786,692.00	PCC		
6011-24	HMA/PCC	No	20	HMA Overlay	\$286,122.00	HMA	X	No
			20	PCC Overlay	\$993,930.00	PCC		
			35	PCC Overlay	\$711,019.00	PCC		
6802-27	HMA	No	20	PCC Overlay	\$1,020,790.00	PCC	X	No
			20	HMA on FDR	\$665,596.00	HMA		
			35	PCC Overlay	\$824,856.00	PCC		

State Project Number (SP#)	Existing Pavement Type	Exception for low-cost option?	Design Life (in years)	Option Description	Present Worth / Roadway Mile	Optional Material (1)	Selected Option (2)	Alternate Bid? (3)
6910-89	HMA	No	15	HMA Overlay	\$976,850.00	HMA	X	No
			20	New PCC	\$2,029,798.00	PCC		
			20	HMA on FDR	\$1,942,330.00	HMA		
			35	New PCC	\$2,089,533.00	PCC		
Note: Present Worth is for the entire length of the project								
6916-104	HMA	No	15	HMA Overlay	\$355,172.00	HMA	X	No
			20	HMA on FDR	\$452,188.00	HMA		
			20	PCC Overlay	\$528,830.00	PCC		
6917-141	HMA	No	20	HMA Overlay	\$297,144.00	HMA	X	No
			20	PCC Overlay	\$599,000.00	PCC		
			20	HMA on FDR	\$462,830.00	HMA		
			35	New PCC	\$760,314.00	PCC		
7302-22	HMA	No	15	HMA overlay	\$595,560.00	HMA	X	No
			15	PCC Overlay	\$614,272.00	PCC		
			15	HMA Overlay	\$565,356.00	HMA		
7506-17	HMA	Yes	15	HMA Overlay	\$997,532.00	HMA	X	No
			20	HMA on CIR	\$1,665,189.00	PCC		
			20	PCC Overlay	\$783,155.00	HMA		
8706-23	HMA	No	15	HMA Overlay	\$415,633.00	HMA	X	No
			20	PCC Overlay	\$444,516.00	PCC		
			20	New HMA	\$812,403.00	HMA		
			35	New PCC	\$723,656.00	PCC		

(1) **Option material** - The pavement material that each option utilizes.

(2) **Selected Option**- This is marked (X) if the pavement option was selected to be constructed.

If the project uses alternate bidding, more than one option will be marked and
and the constructed option will be the low-cost option as determined by alternate bidding.

(3) **Alternate Bidding?** - 'Yes' if the project used alternate bidding to select which option to construct.

Definitions:

HMA = Hot-Mix Asphalt

PCC = Portland Cement Concrete

FDR = Full-Depth Reclamation (recycle existing HMA and Base to use as a new base)

CIR = Cold-in-Place Recycling (Recycle a layer of existing HMA with Cold-Mix Asphalt

CPR = Concrete Pavement Repair

Rubblize = Break the existing PCC into pieces to act as the new base for HMA pavement

Crack & Seat = Crack and compact the existing PCC pavement to delay reflective cracking in an HMA overlay

Appendix B: Copies of LCCAs

District	Metro
Performed By	TRC/DFN
Analysis Period	35
Discount Rate	2.2

Project Number	1002-101
Date	1/6/2014
Funding Category	RS
Low Cost Option #	4
Chosen Option #	1,3 Alt Bid

District	Metro
Performed By	TRC/DFN
Analysis Period	35
Discount Rate	2.2

OPTION #1					OPTION #2					OPTION #3					OPTION #4				
DESCRIPTION					DESCRIPTION					DESCRIPTION					DESCRIPTION				
Mill 5" + 7" PCC (conc shlds)					Mill 5" + 7" PCC (bit shlds)					SFDR + 2.0" Bituminous + UTBWC					Mill 5" + 5" PCC (BCOA-ME)				
		DESIGN LIFE		TYPE			DESIGN LIFE		TYPE			DESIGN LIFE		TYPE			DESIGN LIFE		TYPE
		35 Years		PCC			35 Years		PCC			20 Years		HMA			20 Years		PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0			Mill 5" + 7" PCC (conc shlds)	\$ 569,433	0			Mill 5" + 7" PCC (bit shlds)	\$ 573,328	0			SFDR + 2.0" Bit + UTBWC	\$ 571,833	0			Mill 5" + 5" PCC (BCOA-ME)	\$ 413,635
1				\$ -	1				\$ -	1				\$ -	1				\$ -
2				\$ -	2				\$ -	2				\$ -	2				\$ -
3				\$ -	3				\$ -	3				\$ -	3				\$ -
4				\$ -	4				\$ -	4				\$ -	4				\$ -
5				\$ -	5				\$ -	5				\$ -	5				\$ -
6				\$ -	6				\$ -	6				\$ -	6				\$ -
7				\$ -	7				\$ -	7				\$ -	7				\$ -
8				\$ -	8				\$ -	8	BC		Light Crack Treatment	\$ 3,500	8				\$ -
9				\$ -	9				\$ -	9				\$ -	9				\$ -
10				\$ -	10				\$ -	10				\$ -	10				\$ -
11				\$ -	11				\$ -	11				\$ -	11				\$ -
12				\$ -	12				\$ -	12				\$ -	12				\$ -
13				\$ -	13				\$ -	13				\$ -	13				\$ -
14				\$ -	14				\$ -	14				\$ -	14				\$ -
15				\$ -	15				\$ -	15				\$ -	15				\$ -
16				\$ -	16				\$ -	16				\$ -	16				\$ -
17	AO		Reseal Joints (15')	\$ 30,679	17	BK		Reseal Joints (design #2)	\$ 30,679	17				\$ -	17				\$ -
18				\$ -	18				\$ -	18				\$ -	18				\$ -
19				\$ -	19				\$ -	19				\$ -	19				\$ -
20				\$ -	20				\$ -	20	BN	15	2.5" Mill & 3" OL	\$ 265,902	20	BH	35	R & R with 35 yr 7" PCC	\$ 519,548
21				\$ -	21				\$ -	21				\$ -	21				\$ -
22				\$ -	22				\$ -	22				\$ -	22				\$ -
23				\$ -	23				\$ -	23	AA		Crack Treatment	\$ 7,000	23				\$ -
24				\$ -	24				\$ -	24				\$ -	24				\$ -
25				\$ -	25				\$ -	25				\$ -	25				\$ -
26				\$ -	26				\$ -	26				\$ -	26				\$ -
27	AQ		Minor CPR (15')	\$ 103,807	27	BL		Minor CPR (design #2)	\$ 202,717	27	AB		Surface Treatment	\$ 40,000	27				\$ -
28				\$ -	28				\$ -	28				\$ -	28				\$ -
29				\$ -	29				\$ -	29				\$ -	29				\$ -
30				\$ -	30				\$ -	30				\$ -	30				\$ -
31				\$ -	31				\$ -	31				\$ -	31				\$ -
32				\$ -	32				\$ -	32				\$ -	32				\$ -
33				\$ -	33				\$ -	33				\$ -	33				\$ -
34				\$ -	34				\$ -	34				\$ -	34				\$ -
35			Remaining Service Life Value**	\$ (39,926)	35			Remaining Service Life Value**	\$ (77,968)	35			Remaining Service Life Value**	\$ -	35			Remaining Service Life Value**	\$ (296,884)

Life Cycle Cost Analysis

District	2
Performed By	KO
Analysis Period	35

Project Number	1120-55
Date	9/17/2014
Discount Rate	2.2

Funding Category	
Low Cost Option	1
Chosen Option	

Option 1			Option 2			Option 3		
Description	1.5: mill, 3" overlay		Description	4.5" thin concrete		Description	Reclaim	
Design Life	15		Design Life	20		Design Life	20	
Year	Description	Cost/Mile	Year	Description	Cost/Mile	Year	Description	Cost/Mile
0	Initial Cost	\$ 198,192.87	0	Initial Cost	\$ 338,060.80	0	Initial Cost	\$ 408,411.70
1		\$ -	1		\$ -	1		\$ -
2		\$ -	2		\$ -	2		\$ -
3	Crack Treatment	\$ 7,000.00	3		\$ -	3		\$ -
4		\$ -	4		\$ -	4		\$ -
5		\$ -	5		\$ -	5		\$ -
6		\$ -	6		\$ -	6		\$ -
7	Chip Seal	\$ 19,000.00	7		\$ -	7		\$ -
8		\$ -	8		\$ -	8	Light Crack Treatment	\$ 3,500.00
9		\$ -	9		\$ -	9		\$ -
10		\$ -	10		\$ -	10		\$ -
11		\$ -	11		\$ -	11		\$ -
12		\$ -	12		\$ -	12	Chip Seal	\$ 19,000.00
13		\$ -	13		\$ -	13		\$ -
14		\$ -	14		\$ -	14		\$ -
15	Mill & Overlay (2nd Overlay)	\$ 100,663.69	15		\$ -	15		\$ -
16		\$ -	16		\$ -	16		\$ -
17		\$ -	17		\$ -	17		\$ -
18	Crack Treatment	\$ 7,000.00	18		\$ -	18		\$ -
19		\$ -	19		\$ -	19		\$ -
20		\$ -	20	Remove and replace concrete	\$ 433,476.27	20	Mill & Overlay (1st Overlay)	\$ 100,663.69
21		\$ -	21		\$ -	21		\$ -
22	Chip Seal	\$ 19,000.00	22		\$ -	22		\$ -
23		\$ -	23		\$ -	23	Crack Treatment	\$ 7,000.00
24		\$ -	24		\$ -	24		\$ -
25		\$ -	25		\$ -	25		\$ -
26		\$ -	26		\$ -	26		\$ -
27		\$ -	27		\$ -	27	Chip Seal	\$ 19,000.00
28		\$ -	28		\$ -	28		\$ -
29	Mill & Overlay (3rd Overlay)	\$ 238,587.22	29		\$ -	29		\$ -
30		\$ -	30		\$ -	30		\$ -
31		\$ -	31		\$ -	31		\$ -
32	Crack Treatment	\$ 7,000.00	32		\$ -	32		\$ -
33		\$ -	33		\$ -	33		\$ -
34		\$ -	34		\$ -	34		\$ -
35	Remaining Service Life	\$ (128,837.10)	35	Remaining Service Life	\$ (108,369.00)	35	Remaining Service Life	\$ -

Total Present Worth	\$ 380,465.08
Eq. Annual Cost	\$ 15,700.89
% of Low Cost	100%

Total Project Cost	\$ 7,670,175.98
--------------------	-----------------

Total Present Worth	\$ 567,973.32
Eq. Annual Cost	\$ 23,438.91
% of Low Cost	149%

Total Project Cost	\$ 11,450,342.09
--------------------	------------------

Total Present Worth	\$ 505,928.34
Eq. Annual Cost	\$ 20,878.46
% of Low Cost	133%

Total Project Cost	\$ 10,199,515.32
--------------------	------------------

Cost Analysis SP 2404-41/ TH 65 From I-35 to T.H. 13

Givens:

Length =	7.05 miles		
Width of Road =	24 feet(Conc.)	24 feet(Bit.)	3/31/14-TRM
1" Bituminous =	113 lbs/SY		
Interest Rate =	2.2 %		
Inflation Rate =	0 %		

MILL 3" & 3" Bituminous Overlay(15 Year Fix)					Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
3" MILL BITUMINOUS		SY	1.02	\$101,249.28	Initial Cost	0	\$176,304	1.000	\$176,304	\$7,276
PATCH		Ton	100.00	\$28,200.00	Rout & seal	2	\$5,000	0.957	\$4,787	\$198
TACK COAT		GAL	\$1.00	\$19,852.80	Chipseal	4	\$25,000	0.917	\$22,916	\$946
3" SPWEB340B	Wear	TON	65.00	\$1,093,641.12	Mill 3" & 3" Overlay	15	\$176,304	0.722	\$127,203	\$5,249
		Total Cost:		\$1,242,943	Rout & seal	17	\$5,000	0.691	\$3,454	\$143
		Cost/Mile:		\$176,304	Chipseal	19	\$25,000	0.661	\$16,534	\$682
					Mill 3" & 3" Overlay	30	\$176,304	0.521	\$91,777	\$3,787
					Rout & seal	32	\$5,000	0.498	\$2,492	\$103
					Chipseal	34	\$25,000	0.477	\$11,929	\$492
					Mill 3" & 3" Overlay	45	\$176,304	0.376	\$66,217	\$2,733
					Remaining Life Value	50	(\$118,124)	0.337	-\$39,792	-\$1,642
					Total Present Worth:				\$483,822	\$19,966
					Equivalent Annual Cost:				\$19,966	\$19,966
Reconstruct-7.5" Concrete -Select Granular(20 Year Fix)					Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
12" Select Granular Mod.		CY	11.86	\$392,423.68	Initial Cost	0	\$4,863,629	1.000	\$689,876	\$28,470

Cost Analysis/ S.P. 2505-53-T.H. 52 SB From Pine Island to Zumbrota

Givens:

Length =	7.759 miles		
Width of Road =	24 feet(Conc.)	24 feet(Bit.)	7/17/14-TRM
1" Bituminous =	113 lbs/SY		
Interest Rate =	2 %		
Inflation Rate =	0 %		

MILL 1.5" & 3.0" min. Bituminous Overlay(17 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
1.5" MILL BITUMINOUS		SY	\$0.80	\$87,397.38	Initial Cost	0	\$161,274	1.000	\$161,274	\$6,451
PATCH		Ton	\$100.00	\$31,036.00	Rout & seal	2	\$2,000	0.961	\$1,922	\$77
TACK COAT		GAL	\$1.00	\$21,849.34	Chipseal	4	\$20,000	0.924	\$18,477	\$739
3.0" SPWEB440E	Wear	TON	\$60.00	\$1,111,039.14	Mill & 3" Overlay	17	\$161,274	0.714	\$115,176	\$4,607
		Total Cost:		\$1,251,322	Rout & seal	19	\$2,000	0.686	\$1,373	\$55
		Cost/Mile:		\$161,274	Chipseal	21	\$20,000	0.660	\$13,196	\$528
					Mill & 3" Overlay	33	\$161,274	0.520	\$83,899	\$3,356
					Remaining Life Value	35	(\$139,771)	0.500	-\$69,889	-\$2,796
					Total Present Worth:				\$325,427	\$13,018
					Equivalent Annual Cost:				\$13,018	\$13,018

MILL 3" & 4.5" min. Bituminous Overlay(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
3" MILL BITUMINOUS		SY	\$1.20	\$131,096.06	Initial Cost	0	\$239,910	1.000	\$239,910	\$9,597
PATCH		Ton	\$100.00	\$31,036.00	Rout & seal	3	\$2,000	0.942	\$1,885	\$75
TACK COAT		GAL	\$1.00	\$32,774.02	Chipseal	5	\$20,000	0.906	\$18,115	\$725
4.5" SPWEB440E	Wear	TON	\$60.00	\$1,666,558.71	Mill & 3" Overlay	20	\$161,274	0.673	\$108,533	\$4,342
		Total Cost:		\$1,861,465	Rout & seal	22	\$2,000	0.647	\$1,294	\$52
		Cost/Mile:		\$239,910	Chipseal	24	\$20,000	0.622	\$12,434	\$497
					Remaining Life Value	35	(\$19,030)	0.500	-\$9,516	-\$381
					Total Present Worth:				\$372,655	\$14,907
					Equivalent Annual Cost:				\$14,907	\$14,907

7.5" Unbonded Overlay(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
4.5" MILL BITUMINOUS		SY	\$1.85	\$202,106.43	Initial Cost	0	\$358,994	1.000	\$358,994	\$14,361
PASSRC		Ton	\$58.54	\$453,303.44	Reseal Joints	13	\$55,000	0.773	\$42,517	\$1,701
Place Conc. Pvmt. 7.5"		SY	\$3.77	\$411,860.13	Major CPR	25	\$250,000	0.610	\$152,383	\$6,096
Structural Concrete		CY	\$68.34	\$1,244,320.14	Remaining Life Value	35	\$0	0.500	\$0	\$0
Reinforcement Bars	Epoxy	lb	\$0.80	\$38,608.78					\$553,894	\$22,157
Dowel Bars	Epoxy	each	\$6.64	\$435,238.93					\$22,157	\$22,157
		Total Cost:		\$2,785,438						
		Cost/Mile:		\$358,994						

1. Preventive Maintenance adds 1 year of life to thin overlays and 2 years to medium overlays and Reclaimed pavements.
2. Each successive overlay has 1 year less life than previous one on a section.
3. Medium overlay-17 years, heavy bit. overlay-20 years, reclamation overlay-20 years, CIR-20 years, unbonded overlay-20 years.
4. Aggregate and shoulder quantities were not included in each option.
5. Calculations are based on 35 year life cycle.
6. Costs are based upon recent district project costs.

AT LEAST ONE BITUMINOUS & ONE PCC OPTION WITH EQUAL DESIGN LIVES IS REQUIRED

Project Number	2613-18	
Date	12/31/2013	
Funding Category	RS	
Low Cost Option #	1	
Chosen Option #	1	

Project Number		2613-18
Date		12/31/2013
Funding Category	RS	▼
Low Cost Option #		1/1/1900
Chosen Option #		1/1/1900

[illegible][illegible]

* Equivalent Annual Cost is included for information only.

AT LEAST ONE BITUMINOUS & ONE PCC OPTION WITH EQUAL DESIGN LIVES IS REQUIRED

District	Metro	Project Number	2733-89	District	Metro	Project Number	2733-89
Performed By	TC / HD	Date	9/16/2014	Performed By	TC / HD	Date	9/16/2014
Analysis Period	35	Funding Category	RD	Analysis Period	35	Funding Category	RD v
Discount Rate	2	Low Cost Option #	1	Discount Rate	2	Low Cost Option #	1/1/1900
		Chosen Option #				Chosen Option #	

District	Metro	Project Number	2733-89	District	Metro	Project Number	2733-89
Performed By	TC / HD	Date	9/16/2014	Performed By	TC / HD	Date	9/16/2014
Analysis Period	35	Funding Category	RD	Analysis Period	35	Funding Category	RD v
Discount Rate	2	Low Cost Option #	1	Discount Rate	2	Low Cost Option #	1/1/1900
		Chosen Option #				Chosen Option #	

District	Metro	Project Number	2733-89	District	Metro	Project Number	2733-89
Performed By	TC / HD	Date	9/16/2014	Performed By	TC / HD	Date	9/16/2014
Analysis Period	35	Funding Category	RD	Analysis Period	35	Funding Category	RD v
Discount Rate	2	Low Cost Option #	1	Discount Rate	2	Low Cost Option #	1/1/1900
		Chosen Option #				Chosen Option #	

District	Metro	Project Number	2733-89	District	Metro	Project Number	2733-89
Performed By	TC / HD	Date	9/16/2014	Performed By	TC / HD	Date	9/16/2014
Analysis Period	35	Funding Category	RD	Analysis Period	35	Funding Category	RD v
Discount Rate	2	Low Cost Option #	1	Discount Rate	2	Low Cost Option #	1/1/1900
		Chosen Option #				Chosen Option #	

OPTION #1					OPTION #2					OPTION #3					OPTION #4					OPTION #5					OPTION #6									
DESCRIPTION					DESCRIPTION					DESCRIPTION					DESCRIPTION					DESCRIPTION					DESCRIPTION									
4" Bit Overlay					Bituminous Reconstruction					20-Yr Concrete Reconstruction					35-Yr Concrete Reconstruction																			
		DESIGN LIFE		TYPE			DESIGN LIFE		TYPE			DESIGN LIFE		TYPE			DESIGN LIFE		TYPE			DESIGN LIFE		TYPE			DESIGN LIFE		TYPE			DESIGN LIFE		TYPE
		14 Years		HMA			20 Years		HMA			20 Years		PCC			35 Years		PCC					PCC					BIT					
Year	#	Life	Description		Cost/Mile		Year	#	Life	Description		Cost/Mile		Year	#	Life	Description		Cost/Mile		Year	#	Life	Description		Cost/Mile		Year	#	Life	Description		Cost/Mile	
0			4" Bit Overlay		\$ 533,531		0			New Bit Pavement		\$ 1,456,711		0			New 20-yr Concrete		\$ 1,496,681		0			New 35-yr Concrete		\$ 1,537,046		0						
1					\$ -		1					\$ -		1					\$ -		1					\$ -		1					\$ -	
2					\$ -		2					\$ -		2					\$ -		2					\$ -		2					\$ -	
3	AA		Crack Treatment		\$ 10,500		3					\$ -		3					\$ -		3					\$ -		3					\$ -	
4					\$ -		4					\$ -		4					\$ -		4					\$ -		4					\$ -	
5					\$ -		5					\$ -		5					\$ -		5					\$ -		5					\$ -	
6					\$ -		6					\$ -		6					\$ -		6					\$ -		6					\$ -	
7	AB		Surface Treatment		\$ 67,500		7					\$ -		7					\$ -		7					\$ -		7					\$ -	
8					\$ -		8	BC		Light Crack Treatment		\$ 5,250		8					\$ -		8					\$ -		8					\$ -	
9					\$ -		9					\$ -		9					\$ -		9					\$ -		9					\$ -	
10					\$ -		10					\$ -		10					\$ -		10					\$ -		10					\$ -	
11					\$ -		11					\$ -		11					\$ -		11					\$ -		11					\$ -	
12					\$ -		12	AB		Surface Treatment		\$ 67,500		12					\$ -		12					\$ -		12					\$ -	
13					\$ -		13					\$ -		13	BF		Minor CPR (20-yr)		\$ 73,510		13					\$ -		13					\$ -	
14	BA		3.5" M&O		\$ 417,684		14					\$ -		14					\$ -		14					\$ -		14					\$ -	
15					\$ -		15					\$ -		15					\$ -		15					\$ -		15					\$ -	
16					\$ -		16					\$ -		16					\$ -		16					\$ -		16					\$ -	
17	AA		Crack Treatment		\$ 10,500		17					\$ -		17					\$ -		17			1st CPR (35-yr)		\$ 55,003		17					\$ -	
18					\$ -		18					\$ -		18					\$ -		18					\$ -		18					\$ -	
19					\$ -		19					\$ -		19					\$ -		19					\$ -		19					\$ -	
20					\$ -		20	BD		3.0" M&O		\$ 353,901		20					\$ -		20					\$ -		20					\$ -	
21	AB		Surface Treatment		\$ 67,500		21					\$ -		21					\$ -		21					\$ -		21					\$ -	
22					\$ -		22					\$ -		22					\$ -		22					\$ -		22					\$ -	
23					\$ -		23	AA		Crack Treatment		\$ 10,500		23					\$ -		23					\$ -		23					\$ -	
24					\$ -		24					\$ -		24					\$ -		24					\$ -		24					\$ -	
25					\$ -		25					\$ -		25	BG		Major CPR (20-yr)		\$ 224,265		25					\$ -		25					\$ -	
26					\$ -		26					\$ -		26					\$ -		26					\$ -		26					\$ -	
27	BB		4.0" M&O		\$ 461,478		27	AB		Surface Treatment		\$ 67,500		27					\$ -		27			2nd CPR (35-yr)		\$ 143,557		27					\$ -	
28					\$ -		28					\$ -		28					\$ -		28					\$ -		28					\$ -	
29					\$ -		29					\$ -		29					\$ -		29					\$ -		29					\$ -	
30	AA		Crack Treatment		\$ 10,500		30					\$ -		30					\$ -		30					\$ -		30					\$ -	
31					\$ -		31					\$ -		31					\$ -		31					\$ -		31					\$ -	
32					\$ -		32					\$ -		32					\$ -		32					\$ -		32					\$ -	
33					\$ -		33					\$ -		33					\$ -		33					\$ -		33					\$ -	
34	AB		Surface Treatment		\$ 67,500		34					\$ -		34					\$ -		34					\$ -		34					\$ -	
35			Remaining Service Life Value**		\$ (153,826.04)		35			Remaining Service Life Value**		\$ -		35			Remaining Service Life Value**		\$ -		35			Remaining Service Life Value**		\$ (55,214.07)		35			Remaining Service Life Value**		\$ -	

* Equivalent Annual Cost is included for information only.
 **Remaining Service Life Value is reported as a negative value.

* Equivalent Annual Cost is included for information only.
 **Remaining Service Life Value is reported as a negative value.

* Equivalent Annual Cost is included for information only.

Project Number	Analysis Period
3606-57	35
Highway	Discount Rate
	2.00%
Date	CLEAR ALL
Performed By	

District 1 - 2014/2015 prices

LCCA SUMMARY					
	Alternate #1	Alternate #2	Alternate #3	Length	
Segment #1	3" M & O	Reclaim & Overlay	20 yr PCC	11.9	
Net Present Cost	\$4,893,566.02	\$6,944,829.63	\$11,517,529.23	Miles	
Segment #2				0.0	
Net Present Cost				Miles	
Segment #3				0.0	
Net Present Cost				Miles	
Segment #4				0.0	
Net Present Cost				Miles	
Segment #5				0.0	
Net Present Cost				Miles	
Segment #6				0.0	
Net Present Cost				Miles	
Segment #7				0.0	
Net Present Cost				Miles	
Segment #8				0.0	
Net Present Cost				Miles	
Project Net Present Cost	\$ 4,893,566.02	\$ 6,944,829.63	\$ 11,517,529.23	Total	
% of Low Cost	100.0%	141.9%	235.4%	11.9	

BID ADJUSTMENT FACTOR SUMMARY					
	Alternate #1	Alternate #2	Alternate #3	Length	
Segment #1	3" M & O	Reclaim & Overlay	20 yr PCC	11.9	
Net Present Cost	\$2,283,565.66	\$1,570,638.39	\$1,637,550.99	Miles	
Segment #2				0.0	
Net Present Cost				Miles	
Segment #3				0.0	
Net Present Cost				Miles	
Segment #4				0.0	
Net Present Cost				Miles	
Segment #5				0.0	
Net Present Cost				Miles	
Segment #6				0.0	
Net Present Cost				Miles	
Segment #7				0.0	
Net Present Cost				Miles	
Segment #8				0.0	
Net Present Cost				Miles	
Project Net Present Cost	\$ 2,283,565.66	\$ 1,570,638.39	\$ 1,637,550.99	Total	
Bid Adjustment Factor	\$ 712,927.27	\$ -	\$ 66,912.60	11.9	

Segment 1											
SEG	Length			SEG	Length			SEG	Length		
1	11.88			1	11.88			1	11.88		
ALT	Description			ALT	Description			ALT	Description		
1		3" M & O		2		Reclaim & Overlay		3		20 yr PCC	
Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE		Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE		Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE	
HMA				HMA				PCC			
Primary Category				Primary Category				Primary Category			
Overlay, DL =13 to 17 years				20 Year HMA				≥12 Joint spacing			
Secondary Category				Secondary Category				Secondary Category			
Rural				Rural				Design Life = 20 Years			
ShoulderCategory				ShoulderCategory				ShoulderCategory			
Bituminous				Bituminous				Thick Bit			
Notes:				Notes:				Notes:			
Year	Activity	Cost/per Mile	Pres. Cost/per Mile	Year	Activity	Cost	Pres. Cost/per Mile	Year	Activity	Cost	Pres. Cost/per Mile
0	3" M&O	\$ 219,697.00	\$ 219,697.00	0	reclaim & 5" overlay	\$ 452,373.00	\$ 452,373.00	0	20 yr PCC	\$ 831,648.00	\$ 831,648.00
1	Crack Treatment	\$ 2,568.19	\$ -	1			\$ -	1			\$ -
2			\$ -	2			\$ -	2			\$ -
3			\$ 2,420.06	3			\$ -	3			\$ -
4			\$ -	4			\$ -	4			\$ -
5	Seal	\$ 7,000.93	\$ -	5			\$ -	5			\$ -
6			\$ -	6			\$ -	6			\$ -
7			\$ 6,094.73	7			\$ -	7			\$ -
8			\$ -	8			\$ 1,095.96	8			\$ -
9			\$ -	9	Crack Treatment	\$ 1,284.10	\$ -	9			\$ -
10			\$ -	10			\$ -	10			\$ -
11			\$ -	11			\$ -	11			\$ -
12			\$ -	12			\$ -	12			\$ -
13	ML Overlay 3.5"	\$ 169,754.37	\$ -	13	Seal	\$ 10,796.53	\$ 8,512.99	13			\$ -
14			\$ -	14			\$ -	14			\$ -
15			\$ 126,129.99	15			\$ -	15			\$ -
16			\$ -	16			\$ -	16			\$ -
17	Crack Treatment	\$ 2,568.19	\$ -	17			\$ -	17			\$ -
18			\$ 1,798.14	18			\$ -	18			\$ -
19			\$ -	19			\$ -	19			\$ -
20			\$ -	20			\$ 128,063.97	20			1st CPR
21	Seal	\$ 7,000.93	\$ -	21	ML Overlay 3.5	\$ 190,296.32	\$ -	21			\$ -
22			\$ 4,528.48	22			\$ -	22			\$ -
23			\$ -	23			\$ 1,628.63	23			\$ -
24			\$ -	24			\$ -	24			\$ -
25	ML Overlay 4.0"	\$ 169,754.37	\$ -	25	Crack Treatment	\$ 2,568.19	\$ -	25			\$ -
26			\$ -	26			\$ -	26			\$ -
27			\$ -	27			\$ -	27			\$ -
28			\$ -	28			\$ -	28			\$ -
29			\$ 95,590.77	29	Seal	\$ 7,000.93	\$ -	29			\$ -
30			\$ -	30			\$ -	30			\$ -
31			\$ -	31			\$ -	31			\$ -
32			\$ -	32			\$ -	32			\$ -
33	Crack Treatment	\$ 2,568.19	\$ 1,362.77	33			\$ -	33			\$ -
34			\$ -	34			\$ -	34			\$ -
35			\$ -	35			\$ -	35			\$ -
35	Remaining Life	\$ (91,406.20)	\$ (45,705.62)	35	2/17 Remaining Life	\$ (22,387.80)	\$ (11,194.52)	35	0/0 Remaining	\$ -	\$ -
Net Present Cost for Segment			\$ 4,893,566.02	Net Present Cost for Segment			\$ 6,944,829.63	Net Present Cost for Segment			\$ 11,517,529.23
Maintenance - Net Present Cost for Segment			\$ 2,283,565.66	Maintenance - Net Present Cost for Segment			\$ 1,570,638.39	Maintenance - Net Present Cost for Segment			\$ 1,637,550.99

Total Lane Width	# of Lanes	Analysis Period	Total Lane Width	# of Lanes	Analysis Period	Total Lane Width	# of Lanes	Analysis Period
24	2	35	24	2	35	24	2	35
Total Shldr Width	# of Shldrs	ML Mix	Total Shldr Width	# of Shldrs	ML Mix	Total Shldr Width	# of Shldrs	ML Mix
6	2	12.5 Wearing Course (3,B)	6	2	12.5 Wearing Course (3,C)	6	2	
Width of Rounding Aggregate	white/ >7 milliom	SL Mix	Width of Rounding Aggregate	white/ >7 milliom	SL Mix	Width of Rounding Aggregate	white/ >7 milliom	SL Mix
2	N	12.5 Wearing Course (3,B)	2	N	12.5 Wearing Course (3,C)		N	12.5 Wearing Course (3,C)
Sealed/UTBWC	ML Thickness		Sealed/UTBWC	ML Thickness		Sealed/UTBWC	ML Thickness	
N			N			N	6	
ML Top Lift / joint spacing	# Dowels per Lane		ML Top Lift / joint spacing	# Dowels per Lane		ML Top Lift / joint spacing	# Dowels per Lane	
1.5			1.5			12	11	
Design Life	Shldr Thickness		Design Life	Shldr Thickness		Design Life	Shldr Thickness	
15	4		20	4			4	

District	1
Performed By	CJM
Analysis Period	35
Discount Rate	2.2
ESALS (20 yr bit)	207,100

Project Number	3608-49
Date	9/10/2014
Funding Category	RS
Low Cost Option #	1
Chosen Option #	1

District	1
Performed By	CJM
Analysis Period	35
Discount Rate	2.2
ESALS (20 yr bit)	1,790,000

Project Number	3608-49	
Date	9/10/2014	
Funding Category	RS	
Low Cost Option #	1	
Chosen Option #	1	

[illegible]

OPTION #2					
DESCRIPTION					
Reconstruct (8 in. PCC over 6 in. ci V)					
panel length 15 ft			DESIGN LIFE	TYPE	
			35 year	PCC	
Year	#	Life	Description	Cost/Mile	
			Reconstruct PCC	\$	383,727
1				\$	-
2				\$	-
3				\$	-
4				\$	-
5				\$	-
6				\$	-
7				\$	-
8				\$	-
9				\$	-
10				\$	-
11				\$	-
12				\$	-
13				\$	-
14				\$	-
15				\$	-
16				\$	-
17	BF		17 year PCC (35 yr design life)	\$	27,270
18				\$	-
19				\$	-
20				\$	-
21				\$	-
22				\$	-
23				\$	-
24				\$	-
25				\$	-
26				\$	-
27	BG		27 year PCC (35 yr design life)	\$	108,659
28				\$	-
29				\$	-
30				\$	-
31				\$	-
32				\$	-
33				\$	-
34				\$	-
35	BG	5	Remaining Service Life Value**	\$	(41,792)
			Total Present Worth	\$	443,432
			Eg. Annual Cost*		\$18,299
			% of Low Cost		116%

OPTION #3					
DESCRIPTION					
Reconstruct (7 in. PCC over 6 in. ci V)					
panel length			DESIGN LIFE	TYPE	
6.0 ft			20 year	PCC	
Year	#	Life	Description	Cost/Mile	
1			Recon 6' Panel PCC Option	\$	322,714
2				\$	-
3				\$	-
4				\$	-
5				\$	-
6				\$	-
7				\$	-
8				\$	-
9				\$	-
10				\$	-
11				\$	-
12				\$	-
13	bb		13 year PCC (20 yr design life)	\$	87,586
14				\$	-
15				\$	-
16				\$	-
17				\$	-
18				\$	-
19				\$	-
20				\$	-
21				\$	-
22				\$	-
23				\$	-
24				\$	-
25	bc		25 year PCC (20 yr design life)	\$	206,494
26				\$	-
27				\$	-
28				\$	-
29				\$	-
30				\$	-
31				\$	-
32				\$	-
33				\$	-
34				\$	-
35			Remaining Service Life Value**	\$	-
			Total Present Worth	\$	508,567
			Eg. Annual Cost*		\$20,987
			% of Low Cost		133%

[illegible]

OPTION #5					
DESCRIPTION					
	#	Life	DESIGN LIFE	Type	
				PCC	
Year	#	Life	Description	Cost/Mile	
1				\$	-
2				\$	-
3				\$	-
4				\$	-
5				\$	-
6				\$	-
7				\$	-
8				\$	-
9				\$	-
10				\$	-
11				\$	-
12				\$	-
13				\$	-
14				\$	-
15				\$	-
16				\$	-
17				\$	-
18				\$	-
19				\$	-
20				\$	-
21				\$	-
22				\$	-
23				\$	-
24				\$	-
25				\$	-
26				\$	-
27				\$	-
28				\$	-
29				\$	-
30				\$	-
31				\$	-
32				\$	-
33				\$	-
34				\$	-
35			Remaining Service Life Value**	\$	-
			Total Present Worth		
			Eg. Annual Cost*		
			% of Low Cost		

OPTION #6					
DESCRIPTION					
Year	#	Life	DESIGN LIFE	TYPE	
				B/T	
Year	#	Life	Description	Cost/Mile	
1				\$	-
2				\$	-
3				\$	-
4				\$	-
5				\$	-
6				\$	-
7				\$	-
8				\$	-
9				\$	-
10				\$	-
11				\$	-
12				\$	-
13				\$	-
14				\$	-
15				\$	-
16				\$	-
17				\$	-
18				\$	-
19				\$	-
20				\$	-
21				\$	-
22				\$	-
23				\$	-
24				\$	-
25				\$	-
26				\$	-
27				\$	-
28				\$	-
29				\$	-
30				\$	-
31				\$	-
32				\$	-
33				\$	-
34				\$	-
35			Remaining Service Life Value**	\$	-
			Total Present Worth		
			Eg. Annual Cost*		
			% of Low Cost		

* Equivalent Annual Cost is included for information only.

**Remaining Service Life Value is reported as a negative value.

* Equivalent Annual Cost is included for information only.

AT LEAST ONE BITUMINOUS & ONE PCC OPTION WITH EQUAL DESIGN LIVES IS REQUIRED

Project Number		4303-89
Date		4/21/2014
Funding Category	RS	
Low Cost Option #	1/2/1900	
Chosen Option #	1/1/1900	

OPTION #1					OPTION #2					OPTION #3					OPTION #4					OPTION #5					OPTION #6				
DESCRIPTION					DESCRIPTION					DESCRIPTION					DESCRIPTION					DESCRIPTION					DESCRIPTION				
3" Mill and 3" Bituminous Overlay					4.5" Whitetopping					4.5" Bituminous Reconstruct																			
	DESIGN LIFE				TYPE		DESIGN LIFE				TYPE		DESIGN LIFE				TYPE		DESIGN LIFE				TYPE		DESIGN LIFE				TYPE
	14				HMA		20				PCC		20				HMA		35				PCC		BIT				
Year	#	Life	Description		Cost/Mile	Year	#	Life	Description		Cost/Mile	Year	#	Life	Description		Cost/Mile	Year	#	Life	Description		Cost/Mile	Year	#	Life	Description		Cost/Mile
0	AE	14	3" Mill and Overlay		\$ 194,695	0	AH	20	4.5" Concrete Whitetopping		\$ 283,693	0	AL	20	4.5" Bituminous Reconstruct		\$ 694,708	0					\$ -	0					\$ -
1					\$ -	1					\$ -	1					\$ -	1					\$ -	1					\$ -
2					\$ -	2					\$ -	2					\$ -	2					\$ -	2					\$ -
3	AA		Crack Treatment		\$ 7,000	3					\$ -	3					\$ -	3					\$ -	3					\$ -
4					\$ -	4					\$ -	4					\$ -	4					\$ -	4					\$ -
5					\$ -	5					\$ -	5					\$ -	5					\$ -	5					\$ -
6					\$ -	6					\$ -	6					\$ -	6					\$ -	6					\$ -
7	AB		Surface Treatment		\$ 19,000	7					\$ -	7					\$ -	7					\$ -	7					\$ -
8					\$ -	8					\$ -	8	AC		Ligh Crack Treatment		\$ 3,500	8					\$ -	8					\$ -
9					\$ -	9					\$ -	9					\$ -	9					\$ -	9					\$ -
10					\$ -	10					\$ -	10					\$ -	10					\$ -	10					\$ -
11					\$ -	11					\$ -	11					\$ -	11					\$ -	11					\$ -
12					\$ -	12					\$ -	12	AB		Surface Treatment		\$ 19,000	12					\$ -	12					\$ -
13					\$ -	13					\$ -	13					\$ -	13					\$ -	13					\$ -
14	AE	13	3" Mill and Overlay		\$ 194,695	14					\$ -	14					\$ -	14					\$ -	14					\$ -
15					\$ -	15					\$ -	15					\$ -	15					\$ -	15					\$ -
16					\$ -	16					\$ -	16					\$ -	16					\$ -	16					\$ -
17	AA		Crack Treatment		\$ 7,000	17					\$ -	17					\$ -	17					\$ -	17					\$ -
18					\$ -	18					\$ -	18					\$ -	18					\$ -	18					\$ -
19					\$ -	19					\$ -	19					\$ -	19					\$ -	19					\$ -
20					\$ -	20	AI	35	5.5" Concrete Whitetopping		\$ 341,295	20	AM	15	2" Mill and 3.5" Overlay		\$ 18,622	20					\$ -	20					\$ -
21	AB		Surface Treatment		\$ 19,000	21					\$ -	21					\$ -	21					\$ -	21					\$ -
22					\$ -	22					\$ -	22					\$ -	22					\$ -	22					

* Equivalent Annual Cost is included for information only.
 **Remaining Service Life Value is reported as a negative value.

* Equivalent Annual Cost is included for information only.

District	2
Performed By	J. Howe
Analysis Period	35
Discount Rate	2.2

Project Number	4503-14
Date	7/23/2013
Funding Category	
Low Cost Option #	1
Chosen Option #	1&3

District	2
Performed By	J. Howe
Analysis Period	35
Discount Rate	2.2

Project Number	4503-14
Date	7/23/2013
Funding Category	
Low Cost Option #	1/1/1900
Chosen Option #	1&3

#	Description	Cost/Mile
AA	Crack Treatment	\$ 7,000
AB	Surface Treatment	\$ 19,000
AC	1.5" Overlay	\$ 77,000
AD	2" Overlay	
AE	3" Overlay	138700
AF	4" Overlay	
AG	4.5" Overlay	
AH	2" Mill & 2" Overlay	113039
AI	1.5" Mill & 3" Overlay	167118
AJ	2" Mill & 3" Overlay	141891
AK	3" Mill & 3" Overlay	285524
AL	2" Mill & 3.5" Overlay	157,072
AM	Reseal Joints (15')	21747
AN	Reseal Joints (6'X6')	123331
AO	Reseal Joints (12')	39769
AP	Minor CPR (12')	100868
AQ	Minor CPR (15')	86739
AR	Major CPR (12')	278780
AS	Major CPR (15')	208129
AT	Major CPR(6x6)	327531
AU	FDR w/New Structure	294000
AV	SDFR w/New Structure	
AW	New Concrete Structure	573000
AX	Concrete Whitetopping	449000
AY	Unbonded Concrete Overlay	
AZ	New Bituminous Structure	
BA	5" MILL & 5" OVERLAY	268337
BB	Minor CPR (12')	29769
BC	Minor CPR & full Depth(12')	128282
BD	Major CPR (12')	271098
BE	2.5" Mill, 4" Overlay	184840
BF	Joint seal & Minor CPR	39768.96
BG	whitetopping joint seal & minor CPR	123331.413
BH	whitetopping major CPR & FDR	327531.307
BI		
BK		
BL		
BM		
BN		
BQ		
BP		
BR		
BS		
BT		
BV		
BU		
BW		
BX		
BY		
BZ		

Yellow Cells are unprotected for input.
Light Blue contain Formulas but are unprotected.
White Cells are protected from input.

[illegible]

* Equivalent Annual Cost is included for information only.

**Remaining Service Life Value is reported as a negative value.

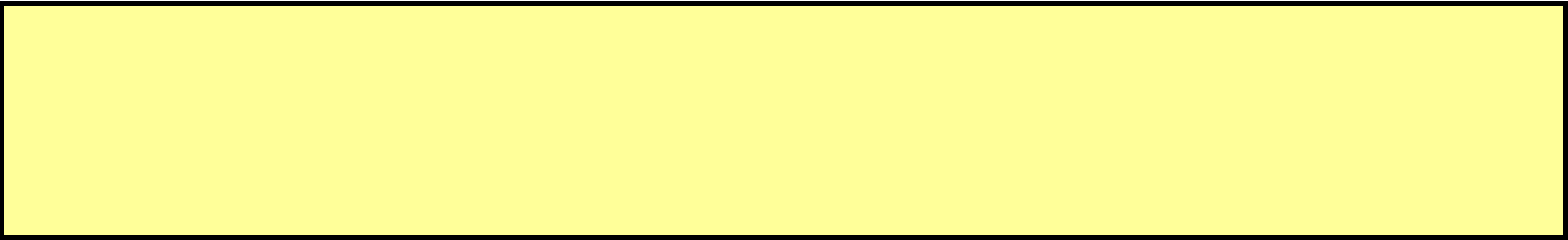
[illegible]

* Equivalent Annual Cost is included for information only.

15' DOWELLED JOINTS

Project Number	Analysis Period
4812-84	35
Highway	Discount Rate
169	2.00%
Date	CLEAR ALL
3/19/2015	
Performed By	
SCOTT ZEIDLER	

District 3 - 2014/2015 prices



LCCA SUMMARY							
	Alternate #1		Alternate #2		Alternate #3		Length
Segment #1	Bituminous Overlay		FDR		4.5" WHITE TOPPING		14.7
Net Present Cost	\$6,229,903.59		\$7,518,286.85		\$8,075,567.06		Miles
Segment #2							0.0
Net Present Cost							Miles
Segment #3							0.0
Net Present Cost							Miles
Segment #4							0.0
Net Present Cost							Miles
Segment #5							0.0
Net Present Cost							Miles
Segment #6							0.0
Net Present Cost							Miles
Segment #7							0.0
Net Present Cost							Miles
Segment #8							0.0
Net Present Cost							Miles
Project Net Present Cost	\$	6,229,903.59		\$	7,518,286.85		8,075,567.06
% of Low Cost		100.0%			120.7%		129.6%
							14.7

BID ADJUSTMENT FACTOR SUMMARY							
	Alternate #1		Alternate #2		Alternate #3		Length
Segment #1	Bituminous Overlay		FDR		4.5" WHITE TOPPING		14.7
Net Present Cost	\$4,523,040.28		\$2,434,138.53		\$4,438,753.25		Miles
Segment #2							0.0
Net Present Cost							Miles
Segment #3							0.0
Net Present Cost							Miles
Segment #4							0.0
Net Present Cost							Miles
Segment #5							0.0
Net Present Cost							Miles
Segment #6							0.0
Net Present Cost							Miles
Segment #7							0.0
Net Present Cost							Miles
Segment #8							0.0
Net Present Cost							Miles
Project Net Present Cost	\$	4,523,040.28		\$	2,434,138.53		4,438,753.25
Bid Adjustment Factor	\$	2,088,901.75		\$	-		2,004,614.72
							14.7

Segment 1											
SEG	Length			SEG	Length			SEG	Length		
1	14.7			1	14.7			1	14.7		
ALT	Description			ALT	Description			ALT	Description		
1		Bituminous Overlay		2		FDR		3		4.5" WHITE TOPPING	
Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE		Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE		Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE	
HMA				HMA				PCC			
Primary Category				Primary Category				Primary Category			
Overlay, DL =13 to 17 years				20 Year HMA				6'X6' ≤ 5.0" Thickness			
Secondary Category				Secondary Category				Secondary Category			
Rural				Rural				Design Life = 20 Years			
ShoulderCategory				ShoulderCategory				ShoulderCategory			
Bituminous		Bituminous		Bituminous		Thin Bit					
Notes:				Notes:				Notes:			
Year	Activity	Cost/per Mile	Pres. Cost/per Mile	Year	Activity	Cost	Pres. Cost/per Mile	Year	Activity	Cost	Pres. Cost/per Mile
0	2" Mill & OL	\$ 116,113.15	\$ 116,113.15	0	FDR	\$ 345,860.43	\$ 345,860.43	0	4.5" WHITE TOPPING	\$ 247,402.30	\$ 247,402.30
1	Crack Treatment	\$ 2,568.19	\$ -	1			\$ -	1			\$ -
2			\$ -	2			\$ -	2			\$ -
3			\$ 2,420.06	3			\$ -	3			\$ -
4			\$ -	4			\$ -	4			\$ -
5			\$ -	5			\$ -	5			\$ -
6	Seal	\$ 7,326.01	\$ -	6			\$ -	6			\$ -
7			\$ 6,377.74	7			\$ -	7			\$ -
8			\$ -	8			\$ 1,095.96	8			\$ -
9			\$ -	9			\$ -	9			\$ -
10			\$ -	10			\$ -	10			\$ -
11	ML Overlay 3.5"	\$ 214,439.56	\$ -	11			\$ -	11			\$ -
12			\$ -	12			\$ 8,969.09	12			\$ -
13			\$ 165,768.76	13			\$ -	13			\$ -
14			\$ -	14			\$ -	14			\$ -
15			\$ -	15			\$ -	15			\$ -
16	Crack Treatment	\$ 2,568.19	\$ 1,870.79	16			\$ -	16			\$ -
17			\$ -	17			\$ -	17			\$ -
18			\$ -	18			\$ -	18			\$ -
19			\$ -	19			\$ -	19			\$ -
20			\$ 4,930.20	20			\$ 163,931.79	20			1st CPR
21	Seal	\$ 7,326.01	\$ -	21			\$ -	21			\$ -
22			\$ -	22			\$ -	22			\$ -
23			\$ -	23			\$ 1,628.63	23			\$ -
24			\$ -	24			\$ -	24			\$ -
25			\$ 130,707.53	25			\$ -	25			\$ -
26	Crack Treatment	\$ 2,568.19	\$ -	26			\$ -	26			\$ -
27			\$ -	27			\$ 4,292.03	27			\$ -
28			\$ 1,475.10	28			\$ -	28			\$ -
29			\$ -	29			\$ -	29			\$ -
30			\$ -	30			\$ -	30			Remove and Replace
31	Seal	\$ 7,326.01	\$ -	31			\$ -	31			\$ -
32			\$ 3,887.43	32			\$ -	32			\$ -
33			\$ -	33			\$ -	33			\$ -
34			\$ -	34			\$ -	34			\$ -
35			\$ (19,494.51)	35			\$ (28,658.12)	35			2/17 Remaining Life
Net Present Cost for Segment				Net Present Cost for Segment				Net Present Cost for Segment			
Maintenance - Net Present Cost for Segment				Maintenance - Net Present Cost for Segment				Maintenance - Net Present Cost for Segment			
Equivalent Annual Cost				Equivalent Annual Cost				Equivalent Annual Cost			

	Total Lane Width	# of Lanes	Analysis Period		Total Lane Width	# of Lanes	Analysis Period		Total Lane Width	# of Lanes	Analysis Period
	24	2	35		24	2	35		24	2	35
	Total Shldr Width	# of Shldrs	ML Mix		Total Shldr Width	# of Shldrs	ML Mix		Total Shldr Width	# of Shldrs	ML Mix
	6	2	SP 9.5 Wearing Course (3,F)		6	2	SP 9.5 Wearing Course (3,F)		6	2	SP 9.5 Wearing Course (3,F)
	Width of Rounding Aggregate	white/ >7 milliom	SL Mix		Width of Rounding Aggregate	white/ >7 milliom	SL Mix		Width of Rounding Aggregate	white/ >7 milliom	SL Mix
	1.5	N	l2.5 Wearing Course (2,B)		1.5	N	l2.5 Wearing Course (2,B)		1.5	Y	l2.5 Wearing Course (2,B)
	Sealed/UTBWC	ML Thickness			Sealed/UTBWC	ML Thickness			Sealed/UTBWC	ML Thickness	
	N				N				N	4.5	
	ML Top Lift / joint spacing	# Dowels per Lane			ML Top Lift / joint spacing	# Dowels per Lane			ML Top Lift / joint spacing	# Dowels per Lane	
	2				2				6		
	Design Life	Shldr Thickness			Design Life	Shldr Thickness			Design Life	Shldr Thickness	
	13	4.5			20	4.5			20	3	

District	3
Performed By	S. Zeidler
Analysis Period	50
Discount Rate	2
Inflation Rate	1.0112

Project Number	4812-86
Date	7/16/2014
Funding Category	
Low Cost Option #	2
Chosen Option #	

District	3
Performed By	S. Zeidler
Analysis Period	50
Discount Rate	2

Project Number	4812-86
Date	7/16/2014
Funding Category	
Low Cost Option #	2
Chosen Option #	

OPTION #1				OPTION #2				OPTION #3				OPTION #4				OPTION #5				OPTION #6				
DESCRIPTION				DESCRIPTION				DESCRIPTION				DESCRIPTION				DESCRIPTION				DESCRIPTION				
6.0" New PCC w/Agg. Base (widen width design)				4.5" New HMA structure				8.0" New PCC w/Agg Base (std width design)																
	DESIGN LIFE		TYPE		DESIGN LIFE		TYPE		DESIGN LIFE		TYPE		DESIGN LIFE		TYPE		DESIGN LIFE		TYPE		DESIGN LIFE		TYPE	
	35		PCC		20		HMA		35		PCC				PCC				PCC				PCC	
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0				\$ 771,847	0				\$ 651,942	0				\$ 896,274	0				\$ -	0				\$ -
1				\$ -	1				\$ -	1				\$ -	1				\$ -	1				\$ -
2				\$ -	2				\$ -	2				\$ -	2				\$ -	2				\$ -
3				\$ -	3				\$ -	3				\$ -	3				\$ -	3				\$ -
4				\$ -	4				\$ -	4				\$ -	4				\$ -	4				\$ -
5				\$ -	5				\$ -	5				\$ -	5				\$ -	5				\$ -
6				\$ -	6	AA		Crack Treatment	\$ 7,000	6				\$ -	6				\$ -	6				\$ -
7				\$ -	7				\$ -	7				\$ -	7				\$ -	7				\$ -
8				\$ -	8				\$ -	8				\$ -	8				\$ -	8				\$ -
9				\$ -	9				\$ -	9				\$ -	9				\$ -	9				\$ -
10				\$ -	10	AB		Surface Treatment	\$ 22,000	10				\$ -	10				\$ -	10				\$ -
11				\$ -	11				\$ -	11				\$ -	11				\$ -	11				\$ -
12				\$ -	12				\$ -	12				\$ -	12				\$ -	12				\$ -
13				\$ -	13				\$ -	13				\$ -	13				\$ -	13				\$ -
14				\$ -	14				\$ -	14				\$ -	14				\$ -	14				\$ -
15				\$ -	15				\$ -	15				\$ -	15				\$ -	15				\$ -
16				\$ -	16				\$ -	16				\$ -	16				\$ -	16				\$ -
17	BM		Reseal Joints (12')	\$ 83,938	17				\$ -	17	BE		Reseal Joints (Option #3)	\$ 74,506	17				\$ -	17				\$ -
18				\$ -	18				\$ -	18				\$ -	18				\$ -	18				\$ -
19				\$ -	19				\$ -	19				\$ -	19				\$ -	19				\$ -
20				\$ -	20	BK		2" Mill & 3.5" HMA OL	\$ 230,094	20				\$ -	20				\$ -	20				\$ -
21				\$ -	21				\$ -	21				\$ -	21				\$ -	21				\$ -
22				\$ -	22				\$ -	22				\$ -	22				\$ -	22				\$ -
23				\$ -	23	AA		Crack Treatment	\$ 7,000	23				\$ -	23				\$ -	23				\$ -
24				\$ -	24				\$ -	24				\$ -	24				\$ -	24				\$ -
25				\$ -	25				\$ -	25				\$ -	25				\$ -	25				\$ -
26				\$ -	26				\$ -	26				\$ -	26				\$ -	26				\$ -
27	BN		Minor CPR (12')	\$ 187,443	27	AB		Surface Treatment	\$ 22,000	27	BF		Minor CPR (Option #3)	\$ 162,997	27				\$ -	27				\$ -
28				\$ -	28				\$ -	28				\$ -	28				\$ -	28				\$ -
29				\$ -	29				\$ -	29				\$ -	29				\$ -	29				\$ -
30				\$ -	30				\$ -	30				\$ -	30				\$ -	30				\$ -
31				\$ -	31				\$ -	31				\$ -	31				\$ -	31				\$ -
32				\$ -	32	AA		Crack Treatment	\$ 7,000	32				\$ -	32				\$ -	32				\$ -
33				\$ -	33				\$ -	33				\$ -	33				\$ -	33				\$ -
34				\$ -	34				\$ -	34				\$ -	34				\$ -	34				\$ -
35				\$ -	35	BI		2.5" Mill & 3" HMA OL-ML & Shld	\$ 268,694	35				\$ -	35				\$ -	35				\$ -
36				\$ -	36				\$ -	36				\$ -	36				\$ -	36				\$ -
37				\$ -	37				\$ -	37				\$ -	37				\$ -	37				\$ -
38				\$ -	38	AA		Crack Treatment	\$ 7,000	38				\$ -	38				\$ -	38				\$ -
39				\$ -	39				\$ -	39				\$ -	39				\$ -	39				\$ -
40	BP		Major CPR (12')	\$ 309,346	40				\$ -	40	BG		Major CPR (Option #3)	\$ 257,156	40				\$ -	40				\$ -
41				\$ -	41				\$ -	41				\$ -	41				\$ -	41				\$ -
42				\$ -	42				\$ -	42				\$ -	42				\$ -	42				\$ -
43				\$ -	43	AB		Surface Treatment	\$ 22,000	43				\$ -	43				\$ -	43				\$ -
44				\$ -	44				\$ -	44				\$ -	44				\$ -	44				\$ -
45				\$ -	45				\$ -	45				\$ -	45				\$ -	45				\$ -
46				\$ -	46				\$ -	46				\$ -	46				\$ -	46				\$ -
47				\$ -	47				\$ -	47				\$ -	47				\$ -	47				\$ -
48				\$ -	48				\$ -	48				\$ -	48				\$ -	48				\$ -
49				\$ -	49				\$ -	49				\$ -	49				\$ -	49				\$ -
50			Remaining Service Life Value**	\$ (103,115)	50			Remaining Service Life Value**	\$ -	50			Remaining Service Life Value**	\$ (85,719)	50			Remaining Service Life Value**	\$ -	50			Remaining Service Life Value**	\$ -
			Total Present Worth	\$ 1,107,241				Total Present Worth	\$ 1,072,557				Total Present Worth	\$ 1,183,868				Total Present Worth					Total Present Worth	
			Eq. Annual Cost*	\$35,236				Eq. Annual Cost*	\$34,132				Eq. Annual Cost*	\$37,674				Eq. Annual Cost*						
			% of Low Cost	103%				% of Low Cost	100%				% of Low Cost	110%				% of Low Cost						

* Equivalent Annual Cost is included for information only.

**Remaining Service Life Value is reported as a negative value.

* Equivalent Annual Cost is included for information only.

Cost Analysis SP 5007-32/ T.H. 105 From Br#5971 to I-90

Givens:

Length =	2.372 miles	RURAL	
Width of Road =	24 feet(Conc.)	24 feet(Bit.)	4/14/15-TRM
1" Bituminous =	113 lbs/SY		
Interest Rate =	2 %		
Inflation Rate =	0 %		

MILL 1.5" & 3.0" min. Bituminous Overlay(15 Year Fix)										
Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
1.5" MILL BITUMINOUS		SY	0.80	\$26,718.21	Initial Cost	0	\$213,005	1.000	\$213,005	\$8,521
PATCH		Ton	200.00	\$18,976.00	Rout & seal	2	\$6,337	0.961	\$6,091	\$244
TACK COAT		GAL	\$1.00	\$6,679.55	Chipseal	4	\$30,000	0.924	\$27,715	\$1,109
3.0" SPWEB340B	Wear	TON	80.00	\$452,873.63	Mill & 3" Overlay	17	\$213,005	0.714	\$152,120	\$6,085
		Total Cost:		\$505,247	Rout & seal	19	\$6,337	0.686	\$4,350	\$174
		Cost/Mile:		\$213,005	Chipseal	21	\$30,000	0.660	\$19,793	\$792
					Mill & 3" Overlay	33	\$213,005	0.520	\$110,811	\$4,433
					Remaining Life Value	35	(\$184,604)	0.500	-\$92,307	-\$3,692
						Total Present Worth:			\$441,579	\$17,664
						Equivalent Annual Cost:			\$17,664	\$17,664
6.5" Whitetopping(20 Year Fix)										
Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
6" MILL BITUMINOUS		SY	3.00	\$100,193.28	Initial Cost	0	\$447,663	1.000	\$447,663	\$17,908
Place Con. Pavement 6.5		SY	7.00	\$233,784.32	Minor CPR	20	\$150,000	0.673	\$100,946	\$4,038
Structural Concrete		CY	85.00	\$551,959.21	Remaining Life Value	35	\$0	0.500	\$0	\$0
Dowel Bars	Epoxy	each	8.19	\$164,116.59		Total Present Worth:			\$548,609	\$21,946
Reinforcement Bars	Epoxy	lb	0.80	\$11,803.07		Equivalent Annual Cost:			\$21,946	\$21,946
		Total Cost:		\$1,061,856						
		Cost/Mile:		\$447,663						
MILL 3" & 4.5" min. Bituminous Overlay(20 Year Fix)										
Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
3" MILL BITUMINOUS		SY	1.20	\$40,077.31	Initial Cost	0	\$315,507	1.000	\$315,507	\$12,621
PATCH		Ton	200.00	\$18,976.00	Rout & seal	3	\$6,337	0.942	\$5,971	\$239
TACK COAT		GAL	\$1.00	\$10,019.33	Chipseal	5	\$30,000	0.906	\$27,172	\$1,087
4.5" SPWEB340B	Wear	TON	80.00	\$679,310.44	Mill & 3" Overlay	20	\$213,005	0.673	\$143,346	\$5,734
		Total Cost:		\$748,383	Rout & seal	22	\$6,337	0.647	\$4,099	\$164
		Cost/Mile:		\$315,507	Chipseal	24	\$30,000	0.622	\$18,652	\$746
					Remaining Life Value	35	(\$25,135)	0.500	-\$12,568	-\$503
						Total Present Worth:			\$502,180	\$20,088
						Equivalent Annual Cost:			\$20,088	\$20,088

1. Preventive Maintenance adds 1 year of life to thin overlays and 2 years to medium overlays and Reclaimed pavements.
2. Each successive overlay has 1 year less life than previous one on a section.
3. Medium overlay-15 years, heavy bit. overlay-20 years, reclamation overlay-20 years, CIR-20 years, whitetopping-20 years.
4. Aggregate and shoulder quantities were not included in each option.
5. Calculations are based on 35 year life cycle.
6. Costs are based upon recent district project costs.

AT LEAST ONE BITUMINOUS & ONE PCC OPTION WITH EQUAL DESIGN LIVES IS REQUIRED

District	8
Performed By	Cody Brand
Analysis Period	35
Discount Rate	2

Project Number	5104-39
Date	5/14/2014
Funding Category	RS
Low Cost Option #	1
Chosen Option #	1

District	8
Performed By	Cody Brand
Analysis Period	35
Discount Rate	2

Project Number		5104-39	
Date		5/14/2014	
Funding Category	RS	▼	
Low Cost Option #		1/1/1900	
Chosen Option #		1/1/1900	

OPTION #1				OPTION #2				OPTION #3				OPTION #4				OPTION #5				OPTION #6				
DESCRIPTION				DESCRIPTION				DESCRIPTION				DESCRIPTION				DESCRIPTION				DESCRIPTION				
3" Mill and 3" Bituminous Overlay				5" PCC Whitetop				4" Bituminous Reconstruct				6" PCC UBOL												
	DESIGN LIFE			TYPE		DESIGN LIFE			TYPE		DESIGN LIFE			TYPE		DESIGN LIFE			TYPE		DESIGN LIFE			TYPE
	14			HMA		20			PCC		20			HMA		35			PCC		35			BIT
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0	AE	14	3" Mill and Overlay	\$ 166,584	0	AH	20	5" PCC Whitetop	\$ 381,928	0	AL	20	4" Bituminous Reconstruct	\$ 658,892	0	AO	35	6" PCC UBOL	\$ 614,125	0				
1				\$ -	1				\$ -	1				\$ -	1				\$ -	1				\$ -
2				\$ -	2				\$ -	2				\$ -	2				\$ -	2				\$ -
3	AA		Crack Treatment	\$ 7,000	3				\$ -	3				\$ -	3				\$ -	3				\$ -
4				\$ -	4				\$ -	4				\$ -	4				\$ -	4				\$ -
5				\$ -	5				\$ -	5				\$ -	5				\$ -	5				\$ -
6				\$ -	6				\$ -	6				\$ -	6				\$ -	6				\$ -
7	AB		Surface Treatment	\$ 19,000	7				\$ -	7				\$ -	7				\$ -	7				\$ -
8				\$ -	8				\$ -	8	AC		High Crack Treatment	\$ 3,500	8				\$ -	8				\$ -
9				\$ -	9				\$ -	9				\$ -	9				\$ -	9				\$ -
10				\$ -	10				\$ -	10				\$ -	10				\$ -	10				\$ -
11				\$ -	11				\$ -	11				\$ -	11				\$ -	11				\$ -
12				\$ -	12				\$ -	12	AB		Surface Treatment	\$ 19,000	12				\$ -	12				\$ -
13				\$ -	13				\$ -	13				\$ -	13				\$ -	13				\$ -
14	AE	13	3" Mill and Overlay	\$ 166,584	14				\$ -	14				\$ -	14				\$ -	14				\$ -
15				\$ -	15				\$ -	15				\$ -	15				\$ -	15				\$ -
16				\$ -	16				\$ -	16				\$ -	16				\$ -	16				\$ -
17	AA		Crack Treatment	\$ 7,000	17				\$ -	17				\$ -	17	AP		6" PCC Repair 1	\$ 45,836	17				\$ -
18				\$ -	18				\$ -	18				\$ -	18				\$ -	18				\$ -
19				\$ -	19				\$ -	19				\$ -	19				\$ -	19				\$ -
20				\$ -	20	AI	35	6" PCC UBOL	\$ 549,634	20	AM	15	2.5" Mill and 4" Overlay	\$ 231,546	20				\$ -	20				\$ -
21	AB		Surface Treatment	\$ 19,000	21				\$ -	21				\$ -	21				\$ -	21				\$ -
22				\$ -	22				\$ -	22				\$ -	22				\$ -	22				\$ -
23				\$ -	23				\$ -	23	AA		Crack Treatment	\$ 7,000	23				\$ -	23				\$ -
24				\$ -	24				\$ -	24				\$ -	24				\$ -	24				\$ -
25				\$ -	25				\$ -	25				\$ -	25				\$ -	25				\$ -
26				\$ -	26				\$ -	26				\$ -	26				\$ -	26				\$ -
27	AF	8	2" Mill and Overlay	\$ 128,953	27				\$ -	27	AB		Surface Treatment	\$ 19,000	27	AQ		6" PCC Repair 2	\$ 131,495	27				\$ -
28				\$ -	28				\$ -	28				\$ -	28				\$ -	28				\$ -
29				\$ -	29				\$ -	29				\$ -	29				\$ -	29				\$ -
30	AA		Crack Treatment	\$ 7,000	30				\$ -	30				\$ -	30				\$ -	30				\$ -
31				\$ -	31				\$ -	31				\$ -	31				\$ -	31				\$ -
32				\$ -	32				\$ -	32				\$ -	32				\$ -	32				\$ -
33				\$ -	33				\$ -	33				\$ -	33				\$ -	33				\$ -
34	AB		Surface Treatment	\$ 19,000	34				\$ -	34				\$ -	34				\$ -	34				\$ -
35			Remaining Service Life Value**	\$ -	35			Remaining Service Life Value**	\$ (314,076.48)	35			Remaining Service Life Value**	\$ -	35			Remaining Service Life Value**	\$ (50,574.95)	35			Remaining Service Life Value**	\$ -

* Equivalent Annual Cost is included for information only.

**Remaining Service Life Value is reported as a negative value.

* Equivalent Annual Cost is included for information only.

Cost Analysis SP 5503-45/ T.H. 14 From 0.2 Mi. E. CSAH 19 to W. Jct. T.H. 74

Givens:

Length =	14.173 miles		
Width of Road =	24 feet(Conc.)	24 feet(Bit.)	5/26/15-TRM
1" Bituminous =	113 lbs/SY		
Interest Rate =	2 %		
Inflation Rate =	0 %		

2" MILL & 3.5" Bituminous Overlay(15 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
2" MILL BITUMINOUS		SY	1.02	\$203,546.96	Initial Cost	0	\$202,958	1.000	\$202,958	\$8,119
PATCH		Ton	120.00	\$68,030.40	Rout & seal	2	\$6,337	0.961	\$6,091	\$244
TACK COAT		GAL	\$1.00	\$39,911.17	Chipseal	4	\$30,000	0.924	\$27,715	\$1,109
3.5" SPWEB340B	Wear	TON	65.00	\$2,565,040.88	Mill & 3" Overlay	17	\$174,006	0.714	\$124,269	\$4,971
		Total Cost:		\$2,876,529	Rout & seal	19	\$6,337	0.686	\$4,350	\$174
		Cost/Mile:		\$202,958	Chipseal	21	\$30,000	0.660	\$19,793	\$792
					Mill & 3" Overlay	33	\$174,006	0.520	\$90,523	\$3,621
					Remaining Life Value	35	(\$150,805)	0.500	-\$75,407	-\$3,016
					Total Present Worth:				\$400,293	\$16,013
					Equivalent Annual Cost:				\$16,013	\$16,013

6" Unbonded Overlay(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
6" MILL BITUMINOUS		SY	2.52	\$502,880.72	Initial Cost	0	\$405,702	1.000	\$405,702	\$16,229
PASSRC		Ton	58.54	\$828,028.05	Major CPR	20	\$150,000	0.673	\$100,946	\$4,038
Place Conc. Pavement 6		SY	3.29	\$656,538.71	Remaining Life Value	35	\$0	0.500	\$0	\$0
Structural Concrete		CY	86.96	\$2,892,229.31	Total Present Worth:				\$506,648	\$20,267
Reinforcement Bars	Epoxy	lb	0.80	\$70,524.85	Equivalent Annual Cost:				\$20,267	\$20,267
Dowel Bars	Epoxy	each	6.68	\$799,819.81						
		Total Cost:		\$5,750,021						
		Cost/Mile:		\$405,702						

MILL 3" & 4.5" Bituminous Overlay(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
3" MILL BITUMINOUS		SY	1.20	\$239,467.01	Initial Cost	0	\$258,610	1.000	\$258,610	\$10,345
PATCH		Ton	120.00	\$68,030.40	Rout & seal	3	\$6,337	0.942	\$5,971	\$239
TACK COAT		GAL	\$1.00	\$59,866.75	Chipseal	5	\$30,000	0.906	\$27,172	\$1,087
4.5" SPWEB340B	Wear	TON	65.00	\$3,297,909.70	Mill & 3" Overlay	22	\$174,006	0.647	\$112,554	\$4,502
		Total Cost:		\$3,665,274	Rout & seal	24	\$6,337	0.622	\$3,940	\$158
		Cost/Mile:		\$258,610	Chipseal	26	\$30,000	0.598	\$17,927	\$717
					Remaining Life Value	35	(\$40,943)	0.500	-\$20,472	-\$819
					Total Present Worth:				\$405,702	\$16,229
					Equivalent Annual Cost:				\$16,229	\$16,229

1. Preventive Maintenance adds 1 year of life to thin overlays and 2 years to medium overlays and Reclaimed pavements.
2. Each successive overlay has 1 year less life than previous one on a section.
3. Thin overlay -10 years life, medium overlay-15 years, heavy bit. overlay-20 years, reclamation overlay-20 years, unbonded-20 years.
4. Aggregate and shoulder quantities were not included in each option.
5. Calculations are based on 35 year life cycle.
6. Costs are based upon recent district project costs.

Cost Analysis/ S.P. 5506-22-T.H.42 From T.H. 14 to 0.35 Mi. N. T.H. 247

Givens:

Length =	14.807 miles		
Width of Road =	24 feet(Conc.)	24 feet(Bit.)	8/4/14-TRM
1" Bituminous =	113 lbs/SY		
Interest Rate =	2 %		
Inflation Rate =	0 %		

MILL 1.5" & 3.0" min. Bituminous Overlay(17 Year Fix)					Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
1.5" MILL BITUMINOUS		SY	\$0.80	\$166,786.05	Initial Cost	0	\$161,274	1.000	\$161,274	\$6,451
PATCH		Ton	\$100.00	\$59,228.00	Rout & seal	2	\$2,000	0.961	\$1,922	\$77
TACK COAT		GAL	\$1.00	\$41,696.51	Chipseal	4	\$20,000	0.924	\$18,477	\$739
3.0" SPWEB340B	Wear	TON	\$60.00	\$2,120,267.64	Mill & 3" Overlay	17	\$161,274	0.714	\$115,176	\$4,607
		Total Cost:		\$2,387,978	Rout & seal	19	\$2,000	0.686	\$1,373	\$55
		Cost/Mile:		\$161,274	Chipseal	21	\$20,000	0.660	\$13,196	\$528
					Mill & 3" Overlay	33	\$161,274	0.520	\$83,899	\$3,356
					Remaining Life Value	35	(\$139,771)	0.500	-\$69,889	-\$2,796
					Total Present Worth:				\$325,427	\$13,018
					Equivalent Annual Cost:				\$13,018	\$13,018

MILL 3" & 4.5" min. Bituminous Overlay(20 Year Fix)					Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
3" MILL BITUMINOUS		SY	\$1.20	\$250,179.07	Initial Cost	0	\$239,910	1.000	\$239,910	\$9,597
PATCH		Ton	\$100.00	\$59,228.00	Rout & seal	3	\$2,000	0.942	\$1,885	\$75
TACK COAT		GAL	\$1.00	\$62,544.77	Chipseal	5	\$20,000	0.906	\$18,115	\$725
4.5" SPWEB340B	Wear	TON	\$60.00	\$3,180,401.45	Mill & 3" Overlay	20	\$161,274	0.673	\$108,533	\$4,342
		Total Cost:		\$3,552,353	Rout & seal	22	\$2,000	0.647	\$1,294	\$52
		Cost/Mile:		\$239,910	Chipseal	24	\$20,000	0.622	\$12,434	\$497
					Remaining Life Value	35	(\$19,030)	0.500	-\$9,516	-\$381
					Total Present Worth:				\$372,655	\$14,907
					Equivalent Annual Cost:				\$14,907	\$14,907

6" Unbonded Overlay(20 Year Fix)					Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
4" MILL BITUMINOUS		SY	\$1.85	\$385,692.74	Initial Cost	0	\$358,994	1.000	\$358,994	\$14,361
PASSRC		Ton	\$58.54	\$865,068.18	Reseal Joints	13	\$55,000	0.773	\$42,517	\$1,701
Place Conc. Pvmt. 6"		SY	\$3.77	\$785,979.25	Major CPR	25	\$250,000	0.610	\$152,383	\$6,096
Structural Concrete		CY	\$68.34	\$2,374,616.36	Remaining Life Value	35	\$0	0.500	\$0	\$0
Reinforcement Bars	Epoxy	lb	\$0.80	\$73,679.63					\$553,894	\$22,157
Dowel Bars	Epoxy	each	\$6.64	\$830,594.52					\$22,157	\$22,157
		Total Cost:		\$5,315,631						
		Cost/Mile:		\$358,994						

1. Preventive Maintenance adds 1 year of life to thin overlays and 2 years to medium overlays and Reclaimed pavements.
2. Each successive overlay has 1 year less life than previous one on a section.
3. Medium overlay-17 years, heavy bit. overlay-20 years, reclamation overlay-20 years, CIR-20 years, unbonded overlay-20 years.
4. Aggregate and shoulder quantities were not included in each option.
5. Calculations are based on 35 year life cycle.
6. Costs are based upon recent district project costs.

District	1
Performed By	CJM
Analysis Period	35
Discount Rate	2.2

Project Number	5880-192
Date	11/19/2015
Funding Category	RS
Low Cost Option #	1
Chosen Option #	1

District	1
Performed By	CJM
Analysis Period	35
Discount Rate	2.2

Project Number	5880-192
Date	11/19/2015
Funding Category	RS
Low Cost Option #	1/1/1900
Chosen Option #	1/1/1900

OPTION #1				OPTION #2				OPTION #3				OPTION #4				OPTION #5				OPTION #6														
DESCRIPTION				DESCRIPTION				DESCRIPTION				DESCRIPTION				DESCRIPTION				DESCRIPTION														
3" Mill and Overlay				Reconstruct (8 in. PCC over 6 in. AB)				Whitetopping (mill 6 in. and place 6 in. PCC)				HMA Reconstruction																						
		DESIGN LIFE		TYPE		panel length		DESIGN LIFE		TYPE		panel length		DESIGN LIFE		TYPE				DESIGN LIFE		TYPE				DESIGN LIFE		TYPE						
		20 year		BIT		15 ft		35 year		PCC		6.0 ft		20 year		PCC						BIT						BIT						
Year	#	Life	Description		Cost/Mile		Year	#	Life	Description		Cost/Mile		Year	#	Life	Description		Cost/Mile		Year	#	Life	Description		Cost/Mile		Year	#	Life	Description		Cost/Mile	
0	AK		3" Mill & 3" Overlay		\$ 143,462		0			Reconstruct PCC		\$ 581,735		0			Whitetopping Option		\$ 472,098		0							0						
1					\$ -		1					\$ -		1					\$ -		1					\$ -		1					\$ -	
2					\$ -		2					\$ -		2					\$ -		2					\$ -		2					\$ -	
3	AA		Crack Treatment		\$ 7,000		3					\$ -		3	AA		Crack Treatment		\$ 7,000		3					\$ -		3					\$ -	
4					\$ -		4					\$ -		4					\$ -		4					\$ -		4					\$ -	
5					\$ -		5					\$ -		5					\$ -		5					\$ -		5					\$ -	
6					\$ -		6					\$ -		6					\$ -		6					\$ -		6					\$ -	
7	AB		Surface Treatment (Chip Seal)		\$ 19,000		7					\$ -		7	AB		Surface Treatment (Chip Seal)		\$ 19,000		7					\$ -		7					\$ -	
8					\$ -		8					\$ -		8					\$ -		8					\$ -		8					\$ -	
9					\$ -		9					\$ -		9					\$ -		9					\$ -		9					\$ -	
10					\$ -		10					\$ -		10					\$ -		10					\$ -		10					\$ -	
11					\$ -		11					\$ -		11					\$ -		11					\$ -		11					\$ -	
12					\$ -		12					\$ -		12					\$ -		12					\$ -		12					\$ -	
13					\$ -		13					\$ -		13	bb		13 year PCC (20 yr design life)		\$ 87,586		13					\$ -		13					\$ -	
14					\$ -		14					\$ -		14					\$ -		14					\$ -		14					\$ -	
15	AH		2" Mill & 2" Overlay		\$ 98,316		15					\$ -		15	AK		3" Mill & 3" Overlay		\$ 143,462		15					\$ -		15					\$ -	
16					\$ -		16					\$ -		16					\$ -		16					\$ -		16					\$ -	
17					\$ -		17	bf		17 year PCC (35 yr design life)		\$ 27,270		17					\$ -		17					\$ -		17					\$ -	
18	AA		Crack Treatment		\$ 7,000		18					\$ -		18	AA		Crack Treatment		\$ 7,000		18					\$ -		18					\$ -	
19					\$ -		19					\$ -		19					\$ -		19					\$ -		19					\$ -	
20					\$ -		20					\$ -		20					\$ -		20					\$ -		20					\$ -	
21					\$ -		21					\$ -		21					\$ -		21					\$ -		21					\$ -	
22	AB		Surface Treatment (Chip Seal)		\$ 19,000		22					\$ -		22	AB		Surface Treatment (Chip Seal)		\$ 19,000		22					\$ -		22					\$ -	
23					\$ -		23					\$ -		23					\$ -		23					\$ -		23					\$ -	
24					\$ -		24					\$ -		24					\$ -		24					\$ -		24					\$ -	
25					\$ -		25					\$ -		25	bc		25 year PCC (20 yr design life)		\$ 255,652		25					\$ -		25					\$ -	
26					\$ -		26					\$ -		26					\$ -		26					\$ -		26					\$ -	
27					\$ -		27	bg		27 year PCC (35 yr design life)		\$ 141,431		27					\$ -		27					\$ -		27					\$ -	
28					\$ -		28					\$ -		28					\$ -		28					\$ -		28					\$ -	
29	AI		1.5" Mill & 3" Overlay		\$ 142,758		29					\$ -		29	AK		3" Mill & 3" Overlay		\$ 143,462		29					\$ -		29					\$ -	
30					\$ -		30					\$ -		30					\$ -		30					\$ -		30					\$ -	
31					\$ -		31					\$ -		31					\$ -		31					\$ -		31					\$ -	
32	AA		Crack Treatment		\$ 7,000		32					\$ -		32	AA		Crack Treatment		\$ 7,000		32					\$ -		32					\$ -	
33					\$ -		33					\$ -		33					\$ -		33					\$ -		33					\$ -	
34					\$ -		34					\$ -		34					\$ -		34					\$ -		34					\$ -	
35	AK	7	Remaining Service Life Value**		\$ (77,249)		35	bg	5	Remaining Service Life Value**		\$ (54,397)		35	AK	7	Remaining Service Life Value**		\$ (77,249)		35			Remaining Service Life Value**		\$ -		35			Remaining Service Life Value**		\$ -	

Life Cycle Cost Analysis

District	2
Performed By	ko
Analysis Period	35

Project Number	6005-61
Date	9/29/2014
Discount Rate	2

Funding Category	RD
Low Cost Option	2
Chosen Option	1

District	2
Performed By	ko
Analysis Period	35

Option 1			Option 2			Option 3			Option 4		
Description	4" mill, 11" reclaim, 6.0" bit (2.0" grade raise)		Description	4.5" BCOA-ME (0.5"grade raise)		Description	6.5" Whitetopping (1.5" grade raise)		Description	7.5" Whitetopping (2" grade raise)	
Design Life	20		Design Life	20		Design Life	20		Design Life	35	
Year	Description	Cost/Mile	Year	Description	Cost/Mile	Year	Description	Cost/Mile	Year	Description	Cost/Mile
0	Initial Cost	\$ 435,631.52	0	Initial Cost	\$ 413,854.22	0	Initial Cost	\$ 629,458.13	0	Initial Cost	\$ 680,022.54
1		\$ -	1		\$ -	1		\$ -	1		\$ -
2		\$ -	2		\$ -	2		\$ -	2		\$ -
3		\$ -	3		\$ -	3		\$ -	3		\$ -
4		\$ -	4		\$ -	4		\$ -	4		\$ -
5		\$ -	5		\$ -	5		\$ -	5		\$ -
6		\$ -	6		\$ -	6		\$ -	6		\$ -
7		\$ -	7		\$ -	7		\$ -	7		\$ -
8	Light Crack Treatment	\$ 3,500.00	8		\$ -	8		\$ -	8		\$ -
9		\$ -	9		\$ -	9		\$ -	9		\$ -
10		\$ -	10		\$ -	10		\$ -	10		\$ -
11		\$ -	11		\$ -	11		\$ -	11		\$ -
12	Chip Seal	\$ 22,000.00	12		\$ -	12		\$ -	12		\$ -
13		\$ -	13		\$ -	13	Reseal Joints & Partial Depth Repair	\$ 71,468.32	13		\$ -
14		\$ -	14		\$ -	14		\$ -	14		\$ -
15		\$ -	15		\$ -	15		\$ -	15		\$ -
16		\$ -	16		\$ -	16		\$ -	16		\$ -
17		\$ -	17		\$ -	17		\$ -	17	Reseal Joints & Partial Depth Repair	\$ 42,779.97
18		\$ -	18		\$ -	18		\$ -	18		\$ -
19		\$ -	19		\$ -	19		\$ -	19		\$ -
20	Mill & Overlay (1st Overlay)	\$ 250,885.35	20	Remove and Replace + 1"	\$ 560,442.67	20		\$ -	20		\$ -
21		\$ -	21		\$ -	21		\$ -	21		\$ -
22		\$ -	22		\$ -	22		\$ -	22		\$ -
23	Crack Treatment	\$ 7,000.00	23		\$ -	23		\$ -	23		\$ -
24		\$ -	24		\$ -	24		\$ -	24		\$ -
25		\$ -	25		\$ -	25	Major CPR	\$ 292,895.74	25		\$ -
26		\$ -	26		\$ -	26		\$ -	26		\$ -
27	Chip Seal	\$ 22,000.00	27		\$ -	27		\$ -	27	Minor CPR & Some Full Depth Repairs	\$ 192,289.39
28		\$ -	28		\$ -	28		\$ -	28		\$ -
29		\$ -	29		\$ -	29		\$ -	29		\$ -
30		\$ -	30		\$ -	30		\$ -	30		\$ -
31		\$ -	31		\$ -	31		\$ -	31		\$ -
32		\$ -	32		\$ -	32		\$ -	32		\$ -
33		\$ -	33		\$ -	33		\$ -	33		\$ -
34		\$ -	34		\$ -	34		\$ -	34		\$ -
35	Remaining Service Life	\$ -	35	Remaining Service Life	\$ (320,252.95)	35	Remaining Service Life	\$ -	35	Remaining Service Life	\$ (73,069.97)

Total Present Worth	\$ 642,132.29
Eq. Annual Cost	\$ 25,686.71
% of Low Cost	102%

Total Project Cost	\$ 1,768,432.34
--------------------	-----------------

Total Present Worth	\$ 630,880.75
Eq. Annual Cost	\$ 25,236.62
% of Low Cost	100%

Total Project Cost	\$ 1,737,445.59
--------------------	-----------------

Total Present Worth	\$ 863,234.46
Eq. Annual Cost	\$ 34,531.29
% of Low Cost	137%

Total Project Cost	\$ 2,377,347.71
--------------------	-----------------

Total Present Worth	\$ 786,692.45
Eq. Annual Cost	\$ 31,469.44
% of Low Cost	125%

Total Project Cost	\$ 2,166,551.00
--------------------	-----------------

Project Number	Analysis Period
6910-89	35
Highway	Discount Rate
	2.00%
Date	CLEAR ALL
Performed By	

District 1 - 2014/2015 prices

LCCA SUMMARY					
	Alternate #1	Alternate #2		Alternate #3	Length
Segment #1	Mill & Overlay	Reclaim & Overlay		20 year Conc	1.6
Net Present Cost	\$976,849.79	\$1,942,330.38		\$2,029,798.64	Miles
Segment #2	35 yr pcc				1.6
Net Present Cost	\$2,089,532.96				Miles
Segment #3					0.0
Net Present Cost					Miles
Segment #4					0.0
Net Present Cost					Miles
Segment #5					0.0
Net Present Cost					Miles
Segment #6					0.0
Net Present Cost					Miles
Segment #7					0.0
Net Present Cost					Miles
Segment #8					0.0
Net Present Cost					Miles
Project Net Present Cost	\$ 3,066,382.76		\$ 1,942,330.38	\$ 2,029,798.64	Total
% of Low Cost	157.9%		100.0%	104.5%	3.1

BID ADJUSTMENT FACTOR SUMMARY					
	Alternate #1	Alternate #2		Alternate #3	Length
Segment #1	Mill & Overlay	Reclaim & Overlay		20 year Conc	1.6
Net Present Cost	\$655,456.62	\$339,344.66		\$400,656.36	Miles
Segment #2	35 yr pcc				1.6
Net Present Cost	\$264,659.82				Miles
Segment #3					0.0
Net Present Cost					Miles
Segment #4					0.0
Net Present Cost					Miles
Segment #5					0.0
Net Present Cost					Miles
Segment #6					0.0
Net Present Cost					Miles
Segment #7					0.0
Net Present Cost					Miles
Segment #8					0.0
Net Present Cost					Miles
Project Net Present Cost	\$ 920,116.44		\$ 339,344.66	\$ 400,656.36	Total
Bid Adjustment Factor	\$ 580,771.78		\$ -	\$ 61,311.70	3.1

Segment 1											
SEG	Length			SEG	Length			SEG	Length		
1	1.56899999999996			1	1.56899999999996			1	1.56899999999996		
ALT	Description			ALT	Description			ALT	Description		
1		Mill & Overlay		2		Reclaim & Overlay		3		20 year Conc	
Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE		Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE		Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE	
HMA				HMA				PCC			
Primary Category				Primary Category				Primary Category			
Overlay, DL =13 to 17 years				20 Year HMA				≥12 Joint spacing			
Secondary Category				Secondary Category				Secondary Category			
Urban				Urban				Design Life = 20 Years			
ShoulderCategory				ShoulderCategory				ShoulderCategory			
Thin				Thick				PCC			
Notes:				Notes:				Notes:			
Year	Activity	Cost/per Mile	Pres. Cost/per Mile	Year	Activity	Cost	Pres. Cost/per Mile	Year	Activity	Cost	Pres. Cost/per Mile
0	2.5" Mill & Overlay	\$204,839.50	\$ 204,839.50	0	Reclaim & Overlay	\$ 1,021,660.75	\$ 1,021,660.75	0	Concrete 20 year	\$ 1,038,331.60	\$ 1,038,331.60
1	Crack Treatment	\$ 5,136.38	\$ -	1			\$ -	1			\$ -
2			\$ -	2			\$ -	2			\$ -
3			\$ 4,840.13	3			\$ -	3			\$ -
4			\$ -	4			\$ -	4			\$ -
5	Seal	\$ 13,322.39	\$ -	5			\$ -	5			\$ -
6			\$ -	6			\$ -	6			\$ -
7			\$ 11,597.94	7			\$ -	7			\$ -
8			\$ -	8			\$ 2,191.93	8			\$ -
9			\$ -	9	Crack Treatment	\$ 2,568.19	\$ -	9			\$ -
10			\$ -	10			\$ -	10			\$ -
11			\$ -	11			\$ -	11			\$ -
12			\$ -	12			\$ -	12			\$ -
13	ML Overlay 3.5"	\$ 358,088.43	\$ -	13	Seal	\$ 20,716.31	\$ -	13			\$ -
14			\$ -	14			\$ -	14			\$ -
15			\$ 266,064.98	15			\$ -	15			\$ -
16			\$ -	16			\$ -	16			\$ -
17	Crack Treatment	\$ 5,136.38	\$ -	17			\$ -	17			\$ -
18			\$ 3,596.29	18			\$ -	18			\$ -
19			\$ -	19			\$ -	19			\$ -
20			\$ -	20			\$ 204,574.47	20			\$ -
21	Seal	\$ 13,322.39	\$ -	21	ML Mill 3.0"	\$ 303,986.91	\$ -	21	1st CPR	\$ 379,448.23	\$ -
22			\$ 8,617.44	22			\$ -	22			\$ -
23			\$ -	23			\$ 3,257.27	23			\$ -
24			\$ -	24			\$ -	24			\$ -
25	ML Overlay 4.0"	\$ 409,410.37	\$ -	25			\$ -	25			\$ -
26			\$ -	26			\$ -	26			\$ -
27			\$ -	27			\$ -	27			\$ -
28			\$ -	28			\$ 7,805.08	28			\$ -
29			\$ 230,544.02	29	Seal	\$ 13,322.39	\$ -	29			\$ -
30			\$ -	30			\$ -	30			\$ -
31			\$ -	31			\$ -	31			\$ -
32			\$ -	32			\$ -	32			\$ -
33	Crack Treatment	\$ 5,136.38	\$ 2,725.54	33			\$ -	33			\$ -
34			\$ -	34			\$ -	34			\$ -
35			\$ -	35			\$ -	35			\$ -
35	Remaining Life	\$ (220,451.74)	\$ (110,231.96)	35	2/17 Remaining Life	\$ (35,763.17)	\$ (17,882.57)	35	0/0 Remaining	\$ -	\$ -
Net Present Cost for Segment			\$ 976,849.79	Net Present Cost for Segment			\$ 1,942,330.38	Net Present Cost for Segment			\$ 2,029,798.64
Maintenance - Net Present Cost for Segment			\$ 655,456.62	Maintenance - Net Present Cost for Segment			\$ 339,344.66	Maintenance - Net Present Cost for Segment			\$ 400,656.36

Total Lane Width	# of Lanes	Analysis Period	Total Lane Width	# of Lanes	Analysis Period	Total Lane Width	# of Lanes	Analysis Period
48	4	35	48	4	35	48	4	35
Total Shldr Width	# of Shldrs	ML Mix	Total Shldr Width	# of Shldrs	ML Mix	Total Shldr Width	# of Shldrs	ML Mix
0	2	12.5 Wearing Course (3,C)	0	2	12.5 Wearing Course (3,C)	0	2	
Width of Rounding Aggregate	white/ >7 milliom	SL Mix	Width of Rounding Aggregate	white/ >7 milliom	SL Mix	Width of Rounding Aggregate	white/ >7 milliom	SL Mix
	N	12.5 Wearing Course (3,C)		N	12.5 Wearing Course (3,C)		N	
Sealed/UTBWC	ML Thickness		Sealed/UTBWC	ML Thickness		Sealed/UTBWC	ML Thickness	
N			N			Y	6	
ML Top Lift / joint spacing	# Dowels per Lane		ML Top Lift / joint spacing	# Dowels per Lane		ML Top Lift / joint spacing	# Dowels per Lane	
1.5			1.5			12	11	
Design Life	Shldr Thickness		Design Life	Shldr Thickness		Design Life	Shldr Thickness	
15	1.5		20	1.5			6	

Segment 2																	
SEG	Length			SEG	Length			SEG	Length								
2	1.569			2	1.569			2	1.569								
ALT	Description			ALT	Description			ALT	Description								
1		35 yr pcc		2				3									
Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE	Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE	Pavement Type		Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE							
PCC																	
Primary Category			Primary Category			Primary Category											
≥12 Joint spacing																	
Secondary Category			Secondary Category			Secondary Category											
Design Life 35 Years																	
ShoulderCategory			ShoulderCategory			ShoulderCategory											
PCC																	
Notes:				Notes:				Notes:									
Year	Activity	Cost	Pres. Cost/per Mile	Year	Activity	Cost	Pres. Cost/per Mile	Year	Activity	Cost	Pres. Cost/per Mile						
0	Concrete 35 year	\$ 1,163,080.40	\$ 1,163,080.40	0			\$ -	0			\$ -						
1			\$ -	1			\$ -	1			\$ -						
2			\$ -	2			\$ -	2			\$ -						
3			\$ -	3			\$ -	3			\$ -						
4			\$ -	4			\$ -	4			\$ -						
5			\$ -	5			\$ -	5			\$ -						
6			\$ -	6			\$ -	6			\$ -						
7			\$ -	7			\$ -	7			\$ -						
8			\$ -	8			\$ -	8			\$ -						
9			\$ -	9			\$ -	9			\$ -						
10			\$ -	10			\$ -	10			\$ -						
11			\$ -	11			\$ -	11			\$ -						
12			\$ -	12			\$ -	12			\$ -						
13			\$ -	13			\$ -	13			\$ -						
14			\$ -	14			\$ -	14			\$ -						
15			\$ -	15			\$ -	15			\$ -						
16			\$ -	16			\$ -	16			\$ -						
17			\$ -	17			\$ -	17			\$ -						
18			\$ -	18			\$ -	18			\$ -						
19			\$ -	19			\$ -	19			\$ -						
20	1st CPR	\$ 250,650.46	\$ 168,680.57	20			\$ -	20			\$ -						
21			\$ -	21			\$ -	21			\$ -						
22			\$ -	22			\$ -	22			\$ -						
23			\$ -	23			\$ -	23			\$ -						
24			\$ -	24			\$ -	24			\$ -						
25			\$ -	25			\$ -	25			\$ -						
26			\$ -	26			\$ -	26			\$ -						
27			\$ -	27			\$ -	27			\$ -						
28			\$ -	28			\$ -	28			\$ -						
29			\$ -	29			\$ -	29			\$ -						
30			\$ -	30			\$ -	30			\$ -						
31			\$ -	31			\$ -	31			\$ -						
32			\$ -	32			\$ -	32			\$ -						
33			\$ -	33			\$ -	33			\$ -						
34			\$ -	34			\$ -	34			\$ -						
35			0/0 Remaining	\$ -			\$ -	35					\$ -	35			\$ -
Net Present Cost for Segment			\$ 2,089,532.96	Net Present Cost for Segment			\$ -	Net Present Cost for Segment			\$ -						
Maintenance - Net Present Cost for Segment			\$ 264,659.82	Maintenance - Net Present Cost for Segment			\$ -	Maintenance - Net Present Cost for Segment			\$ -						

Total Lane Width	# of Lanes	Analysis Period	Total Lane Width	# of Lanes	Analysis Period	Total Lane Width	# of Lanes	Analysis Period
48	4	35						
Total Shldr Width	# of Shldrs	ML Mix	Total Shldr Width	# of Shldrs	ML Mix	Total Shldr Width	# of Shldrs	ML Mix
0	2							
Width of Rounding Aggregate	white/ >7 milliom	SL Mix	Width of Rounding Aggregate	white/ >7 milliom	SL Mix	Width of Rounding Aggregate	white/ >7 milliom	SL Mix
	N							
Sealed/UTBWC	ML Thickness		Sealed/UTBWC	ML Thickness		Sealed/UTBWC	ML Thickness	
Y	7							
ML Top Lift / joint spacing	# Dowels per Lane		ML Top Lift / joint spacing	# Dowels per Lane		ML Top Lift / joint spacing	# Dowels per Lane	
12	11							
Design Life	Shldr Thickness		Design Life	Shldr Thickness		Design Life	Shldr Thickness	
	7							

Project Number	Analysis Period
6916-104	35
Highway	Discount Rate
	2.00%
Date	CLEAR ALL
Performed By	

District 1 - 2014/2015 prices

LCCA SUMMARY					
	Alternate #1	Alternate #2		Alternate #3	Length
Segment #1	3" Mill & Overlay	Reclaim & Overlay		20 year conc	1.0
Net Present Cost	\$355,171.84	\$452,188.04		\$528,829.98	Miles
Segment #2					1.0
Net Present Cost					Miles
Segment #3					1.0
Net Present Cost					Miles
Segment #4					1.0
Net Present Cost					Miles
Segment #5					0.0
Net Present Cost					Miles
Segment #6					0.0
Net Present Cost					Miles
Segment #7					0.0
Net Present Cost					Miles
Segment #8					0.0
Net Present Cost					Miles
Project Net Present Cost	\$ 355,171.84	\$	452,188.04	\$ 528,829.98	Total
% of Low Cost	100.0%		127.3%	148.9%	4.0

BID ADJUSTMENT FACTOR SUMMARY					
	Alternate #1	Alternate #2		Alternate #3	Length
Segment #1	3" Mill & Overlay	Reclaim & Overlay		20 year conc	1.0
Net Present Cost	\$197,594.11	\$139,565.19		\$182,251.94	Miles
Segment #2					1.0
Net Present Cost					Miles
Segment #3					1.0
Net Present Cost					Miles
Segment #4					1.0
Net Present Cost					Miles
Segment #5					0.0
Net Present Cost					Miles
Segment #6					0.0
Net Present Cost					Miles
Segment #7					0.0
Net Present Cost					Miles
Segment #8					0.0
Net Present Cost					Miles
Project Net Present Cost	\$ 197,594.11	\$	139,565.19	\$ 182,251.94	Total
Bid Adjustment Factor	\$ 58,028.92	\$	-	\$ 42,686.76	4.0

Segment 1											
SEG	Length			SEG	Length			SEG	Length		
1	1			1	1			1	1		
ALT	Description			ALT	Description			ALT	Description		
1		3" Mill & Overlay		2		Reclaim & Overlay		3		20 year conc	
Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE		Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE		Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE	
HMA				HMA				PCC			
Primary Category				Primary Category				Primary Category			
Overlay, DL =13 to 17 years				20 Year HMA				6'X6' ≥5.5" Thickness			
Secondary Category				Secondary Category				Secondary Category			
Urban				Rural				Design Life = 20 Years			
ShoulderCategory				ShoulderCategory				ShoulderCategory			
Thick				Bituminous				Thick Bit			
Notes:				Notes:				Notes:			
Year	Activity	Cost/per Mile	Pres. Cost/per Mile	Year	Activity	Cost	Pres. Cost/per Mile	Year	Activity	Cost	Pres. Cost/per Mile
0	3" M&O w/ under	\$ 157,577.73	\$ 157,577.73	0	Reclaim & Overlay	\$ 312,622.85	\$ 312,622.85	0	6" PCC 6' x 6'	\$ 346,578.04	\$ 346,578.04
1	Crack Treatment	\$ 2,568.19	\$ -	1			\$ -	1			\$ -
2			\$ -	2			\$ -	2			\$ -
3			\$ 2,420.06	3			\$ -	3			\$ -
4			\$ -	4			\$ -	4			\$ -
5	Seal	\$ 7,227.42	\$ -	5			\$ -	5			\$ -
6			\$ -	6			\$ -	6			\$ -
7			\$ 6,291.91	7			\$ -	7			\$ -
8			\$ -	8			\$ 1,095.96	8			\$ -
9			\$ -	9	Crack Treatment	\$ 1,284.10	\$ -	9			\$ -
10			\$ -	10			\$ -	10			\$ -
11			\$ -	11			\$ -	11			\$ -
12			\$ -	12			\$ -	12			\$ -
13	ML Overlay 3.5"	\$ 166,695.86	\$ -	13	Seal	\$ 11,088.78	\$ -	13			\$ -
14			\$ -	14			\$ -	14			\$ -
15			\$ 123,857.48	15			\$ -	15			\$ -
16			\$ -	16			\$ -	16			\$ -
17	Crack Treatment	\$ 2,568.19	\$ -	17			\$ -	17			\$ -
18			\$ 1,798.14	18			\$ -	18			\$ -
19			\$ -	19			\$ -	19			\$ -
20			\$ -	20			\$ 135,727.29	20			\$ 182,251.94
21	Seal	\$ 7,227.42	\$ -	21	ML Overlay 3.5	\$ 201,683.61	\$ -	21	1st CPR	\$ 270,816.80	\$ -
22			\$ 4,674.98	22			\$ -	22			\$ -
23			\$ -	23			\$ 1,628.63	23			\$ -
24			\$ -	24			\$ -	24			\$ -
25	ML Overlay 4.0"	\$ 194,607.85	\$ -	25	Crack Treatment	\$ 2,568.19	\$ -	25			\$ -
26			\$ -	26			\$ -	26			\$ -
27			\$ -	27			\$ 4,234.27	27			\$ -
28			\$ -	28			\$ -	28			\$ -
29	Crack Treatment	\$ 2,568.19	\$ 109,586.08	29	Seal	\$ 7,227.42	\$ -	29			\$ -
30			\$ -	30			\$ -	30			\$ -
31			\$ -	31			\$ -	31			\$ -
32			\$ 1,362.77	32			\$ -	32			\$ -
33	Remaining Life	\$ (104,788.84)	\$ -	33	2/17 Remaining Life	\$ (23,727.48)	\$ -	33	0/0 Remaining	\$ -	\$ -
34			\$ -	34			\$ -	34			\$ -
35			\$ (52,397.32)	35			\$ (11,864.40)	35			\$ -
Net Present Cost for Segment			\$ 355,171.84	Net Present Cost for Segment			\$ 452,188.04	Net Present Cost for Segment			\$ 528,829.98
Maintenance - Net Present Cost for Segment			\$ 197,594.11	Maintenance - Net Present Cost for Segment			\$ 139,565.19	Maintenance - Net Present Cost for Segment			\$ 182,251.94
Equivalent Annual Cost			14,207.66	Equivalent Annual Cost			18,088.52	Equivalent Annual Cost			21,154.37

Total Lane Width	# of Lanes	Analysis Period	Total Lane Width	# of Lanes	Analysis Period	Total Lane Width	# of Lanes	Analysis Period
24	2	35	24	2	35	24	2	35
Total Shldr Width	# of Shldrs	ML Mix	Total Shldr Width	# of Shldrs	ML Mix	Total Shldr Width	# of Shldrs	ML Mix
10	2	12.5 Wearing Course (4,B)	10	2	12.5 Wearing Course (3,C)	10	2	
Width of Rounding Aggregate	white/ >7 milliom	SL Mix	Width of Rounding Aggregate	white/ >7 milliom	SL Mix	Width of Rounding Aggregate	white/ >7 milliom	SL Mix
2	N	12.5 Wearing Course (4,B)	2	N	12.5 Wearing Course (3,C)		Y	12.5 Wearing Course (3,C)
Sealed/UTBWC	ML Thickness		Sealed/UTBWC	ML Thickness		Sealed/UTBWC	ML Thickness	
N			N			Y	6	
ML Top Lift / joint spacing	# Dowels per Lane		ML Top Lift / joint spacing	# Dowels per Lane		ML Top Lift / joint spacing	# Dowels per Lane	
2			1.5			6	11	
Design Life	Shldr Thickness		Design Life	Shldr Thickness		Design Life	Shldr Thickness	
15	4		20	4			4	

District	1
Performed By	CJM
Analysis Period	35
Discount Rate	2.2

Project Number	6917-141
Date	8/4/2015
Funding Category	RS
Low Cost Option #	1
Chosen Option #	1

District	1
Performed By	CJM
Analysis Period	35
Discount Rate	2.2

Project Number	6917-141
Date	8/4/2015
Funding Category	RS
Low Cost Option #	1/1/1900
Chosen Option #	1/1/1900

OPTION #1					OPTION #2					OPTION #3					OPTION #4					OPTION #5					OPTION #6										
DESCRIPTION					DESCRIPTION					DESCRIPTION					DESCRIPTION					DESCRIPTION					DESCRIPTION										
3" Mill and Overlay					Reconstruct (6 in. PCC over 4 in. OGAB)					Whitetopping (mill 3 in. and place 5.5 in. PCC)					Reclaim Overlay																				
	DESIGN LIFE			TYPE	panel length	DESIGN LIFE			TYPE	panel length	DESIGN LIFE			TYPE		DESIGN LIFE		TYPE		DESIGN LIFE		TYPE		DESIGN LIFE		TYPE		DESIGN LIFE		TYPE					
	20 year			HMA		35 year			PCC		20 year			PCC		20		HMA		BIT															
Yea	#	Life	Description		Cost/Mile	Yea	#	Life	Description		Cost/Mile	Yea	#	Life	Description		Cost/Mile	Yea	#	Life	Description		Cost/Mile	Yea	#	Life	Description		Cost/Mile	Yea	#	Life	Description		Cost/Mile
0	AK		3" Mill & 3" Overlay		\$ 143,462	0			Reconstruct PCC		\$ 676,923	0			Whitetopping Option		\$ 384,615	0			Reclaim and Overlay		\$ 276,200	0						0					
1					\$ -	1					\$ -	1					\$ -	1					\$ -	1					\$ -	1					\$ -
2					\$ -	2					\$ -	2					\$ -	2					\$ -	2					\$ -	2					\$ -
3	AA		Crack Treatment		\$ 7,000	3					\$ -	3					\$ -	3	AA		Crack Treatment		\$ 7,000	3					\$ -	3					\$ -
4					\$ -	4					\$ -	4					\$ -	4					\$ -	4					\$ -	4					\$ -
5					\$ -	5					\$ -	5					\$ -	5					\$ -	5					\$ -	5					\$ -
6					\$ -	6					\$ -	6					\$ -	6					\$ -	6					\$ -	6					\$ -
7	AB		Surface Treatment (Chip Seal)		\$ 19,000	7					\$ -	7					\$ -	7	AB		Surface Treatment (Chip Seal)		\$ 19,000	7					\$ -	7					\$ -
8					\$ -	8					\$ -	8					\$ -	8					\$ -	8					\$ -	8					\$ -
9					\$ -	9					\$ -	9					\$ -	9					\$ -	9					\$ -	9					\$ -
10					\$ -	10					\$ -	10					\$ -	10					\$ -	10					\$ -	10					\$ -
11					\$ -	11					\$ -	11					\$ -	11					\$ -	11					\$ -	11					\$ -
12					\$ -	12					\$ -	12					\$ -	12					\$ -	12					\$ -	12					\$ -
13					\$ -	13					\$ -	13	bb		13 year PCC (20 yr design life)		\$ 87,586	13					\$ -	13					\$ -	13					\$ -
14					\$ -	14					\$ -	14					\$ -	14					\$ -	14					\$ -	14					\$ -
15	AH		2" Mill & 2" Overlay		\$ 98,316	15					\$ -	15					\$ -	15	AK		3" Mill & 3" Overlay		\$ 143,462	15					\$ -	15					\$ -
16					\$ -	16					\$ -	16					\$ -	16					\$ -	16					\$ -	16					\$ -
17					\$ -	17	bf		17 year PCC (35 yr design life)		\$ 34,088	17					\$ -	17					\$ -	17					\$ -	17					\$ -
18	AA		Crack Treatment		\$ 7,000	18					\$ -	18					\$ -	18	AA		Crack Treatment		\$ 7,000	18					\$ -	18					\$ -
19					\$ -	19					\$ -	19					\$ -	19					\$ -	19					\$ -	19					\$ -
20					\$ -	20					\$ -	20					\$ -	20					\$ -	20					\$ -	20					\$ -
21					\$ -	21					\$ -	21					\$ -	21					\$ -	21					\$ -	21					\$ -
22	AB		Surface Treatment (Chip Seal)		\$ 19,000	22					\$ -	22					\$ -	22	AB		Surface Treatment (Chip Seal)		\$ 19,000	22					\$ -	22					\$ -
23					\$ -	23					\$ -	23					\$ -	23					\$ -	23					\$ -	23					\$ -
24					\$ -	24					\$ -	24					\$ -	24					\$ -	24					\$ -	24					\$ -
25					\$ -	25					\$ -	25	bc		25 year PCC (20 yr design life)		\$ 255,652	25					\$ -	25					\$ -	25					\$ -
26					\$ -	26					\$ -	26					\$ -	26					\$ -	26					\$ -	26					\$ -
27					\$ -	27	bg		27 year PCC (35 yr design life)		\$ 159,114	27					\$ -	27					\$ -	27					\$ -	27					\$ -
28					\$ -	28					\$ -	28					\$ -	28					\$ -	28					\$ -	28					\$ -
29	AI		1.5" Mill & 3" Overlay		\$ 142,758	29					\$ -	29					\$ -	29	AK		3" Mill & 3" Overlay		\$ 143,462	29					\$ -	29					\$ -
30					\$ -	30					\$ -	30					\$ -	30					\$ -	30					\$ -	30					\$ -
31					\$ -	31					\$ -	31					\$ -	31					\$ -	31					\$ -	31					\$ -
32	AA		Crack Treatment		\$ 7,000	32					\$ -	32					\$ -	32	AA		Crack Treatment		\$ 7,000	32					\$ -	32					\$ -
33					\$ -	33					\$ -	33					\$ -	33					\$ -	33					\$ -	33					\$ -
34					\$ -	34					\$ -	34					\$ -	34					\$ -	34					\$ -	34					\$ -
35	AK	7	Remaining Service Life Value**		\$ (77,249)	35	bg	5	Remaining Service Life Value**		\$ (61,198)	35		0	Remaining Service Life Value**		\$ -	35	AK	7	Remaining Service Life Value**		\$ (77,249)	35			Remaining Service Life Value**		\$ -	35			Remaining Service Life Value**		\$ -
			</																																

Project Number	Analysis Period
7506-17	35
Highway	Discount Rate
59	1.74%
Date	CLEAR ALL
11/16/2015	
Performed By	
KR	

District 4 - 2015/2016 prices

LCCA SUMMARY					
	Alternate #1	Alternate #2		Alternate #3	Length
Segment #1	2" Mill & Fill	3" Mill, 3" CIR, 3" Pave		4.5" Whitetopping	0.2
Net Present Cost	\$92,501.72	\$101,528.78		\$147,663.18	Miles
Segment #2	2" Mill & Fill	3" Mill, 3" CIR, 3" Pave		4.5" Whitetopping	5.4
Net Present Cost	\$2,493,007.91	\$2,583,217.62		\$4,132,118.62	Miles
Segment #3	2" Mill & Fill	3" Mill, 3" CIR, 3" Pave		4.5" Whitetopping	5.0
Net Present Cost	\$2,008,578.84	\$2,071,525.99		\$3,385,456.96	Miles
Segment #4					0.0
Net Present Cost					Miles
Segment #5					0.0
Net Present Cost					Miles
Segment #6					0.0
Net Present Cost					Miles
Segment #7					0.0
Net Present Cost					Miles
Segment #8					0.0
Net Present Cost					Miles
Project Net Present Cost	\$ 4,594,088.46		\$ 4,756,272.38	\$ 7,665,238.76	Total
% of Low Cost		100.0%		166.9%	10.7

BID ADJUSTMENT FACTOR SUMMARY					
	Alternate #1	Alternate #2		Alternate #3	Length
Segment #1	2" Mill & Fill	3" Mill, 3" CIR, 3" Pave		4.5" Whitetopping	0.2
Net Present Cost	\$54,285.32	\$33,702.38		\$66,720.98	Miles
Segment #2	2" Mill & Fill	3" Mill, 3" CIR, 3" Pave		4.5" Whitetopping	5.4
Net Present Cost	\$1,503,575.27	\$935,789.78		\$2,020,734.94	Miles
Segment #3	2" Mill & Fill	3" Mill, 3" CIR, 3" Pave		4.5" Whitetopping	5.0
Net Present Cost	\$1,258,771.56	\$784,759.43		\$1,807,921.96	Miles
Segment #4					0.0
Net Present Cost					Miles
Segment #5					0.0
Net Present Cost					Miles
Segment #6					0.0
Net Present Cost					Miles
Segment #7					0.0
Net Present Cost					Miles
Segment #8					0.0
Net Present Cost					Miles
Project Net Present Cost	\$ 2,816,632.14		\$ 1,754,251.58	\$ 3,895,377.88	Total
Bid Adjustment Factor	\$ 1,062,380.57		\$ -	\$ 2,141,126.30	10.7

Segment 1											
SEG	Length			SEG	Length			SEG	Length		
1	.20			1	.20			1	.20		
ALT	Description			ALT	Description			ALT	Description		
1		2" Mill & Fill		2		3" Mill, 3" CIR, 3" Pave		3		4.5" Whitetopping	
Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE		Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE		Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE	
HMA				HMA				PCC			
Primary Category				Primary Category				Primary Category			
Overlay, DL =13 to 17 years				20 Year HMA				6'X6' ≤ 5.0" Thickness			
Secondary Category				Secondary Category				Secondary Category			
Rural				Rural				Design Life = 20 Years			
ShoulderCategory				ShoulderCategory				ShoulderCategory			
Bituminous				Bituminous				Thick Bit			
Notes:				Notes:				Notes:			
Year	Activity	Cost/per Mile	Pres. Cost/per Mile	Year	Activity	Cost	Pres. Cost/per Mile	Year	Activity	Cost	Pres. Cost/per Mile
0	2" Mill & Fill	\$ 191,082.00	\$ 191,082.00	0	3" Mill, 3" CIR, 3" Pave	\$ 339,132.00	\$ 339,132.00	0	4.5" Whitetopping	\$ 404,711.00	\$ 404,711.00
1	Crack Treatment	\$ 2,112.00	\$ -	1			\$ -	1			\$ -
2			\$ -	2			\$ -	2			\$ -
3			\$ 2,005.48	3			\$ -	3			\$ -
4			\$ -	4			\$ -	4			\$ -
5			\$ -	5			\$ -	5			\$ -
6	Seal	\$ 8,878.30	\$ -	6			\$ -	6			\$ -
7			\$ 7,868.42	7			\$ -	7			\$ -
8			\$ -	8			\$ 919.88	8			\$ -
9			\$ -	9			\$ -	9			\$ -
10			\$ -	10			\$ -	10			\$ -
11	ML Overlay 3.5"	\$ 233,135.03	\$ -	11			\$ -	11			\$ -
12			\$ -	12			\$ 10,485.44	12			\$ -
13			\$ -	13			\$ -	13			\$ -
14			\$ -	14			\$ -	14			\$ -
15			\$ 179,983.02	15			\$ -	15			\$ -
16	Crack Treatment	\$ 2,112.00	\$ -	16			\$ -	16			\$ -
17			\$ -	17			\$ -	17			\$ -
18			\$ 1,548.26	18			\$ -	18			\$ -
19			\$ -	19			\$ -	19			\$ -
20			\$ -	20			\$ 165,109.80	20			1st CPR
21	Seal	\$ 8,878.30	\$ -	21			\$ -	21			\$ -
22			\$ 6,074.52	22			\$ -	22			\$ -
23			\$ -	23			\$ 1,420.31	23			\$ -
24			\$ -	24			\$ -	24			\$ -
25			\$ -	25			\$ -	25			\$ -
26	ML Overlay 3.5"	\$ 233,135.03	\$ -	26			\$ -	26			\$ -
27			\$ -	27			\$ 5,572.54	27			\$ -
28			\$ -	28			\$ -	28			\$ -
29			\$ 141,366.75	29			\$ -	29			\$ -
30			\$ -	30			\$ -	30			Remove and Replace
31	Crack Treatment	\$ 2,112.00	\$ -	31			\$ -	31			\$ -
32			\$ 1,216.07	32			\$ -	32			\$ -
33			\$ -	33			\$ -	33			\$ -
34			\$ -	34			\$ -	34			\$ -
35			\$ (125,534.25)	\$ (68,635.93)			35	2/17 Remaining Life			\$ (27,427.65)
Net Present Cost for Segment			\$ 92,501.72	Net Present Cost for Segment			\$ 101,528.78	Net Present Cost for Segment			\$ 147,663.18
Maintenance - Net Present Cost for Segment			\$ 54,285.32	Maintenance - Net Present Cost for Segment			\$ 33,702.38	Maintenance - Net Present Cost for Segment			\$ 66,720.98
Equivalent Annual Cost			3,551.09	Equivalent Annual Cost			3,897.64	Equivalent Annual Cost			5,668.71

Total Lane Width	# of Lanes	Analysis Period	Total Lane Width	# of Lanes	Analysis Period	Total Lane Width	# of Lanes	Analysis Period
24	2	35	24	2	35	24	2	35
Total Shldr Width	# of Shldrs	ML Mix	Total Shldr Width	# of Shldrs	ML Mix	Total Shldr Width	# of Shldrs	ML Mix
20	2	WEARING COURSE MIXTURE (3,I	20	2	WEARING COURSE MIXTURE (3,I	20	2	
Width of Rounding Aggregate	white/ >7 milliom	SL Mix	Width of Rounding Aggregate	white/ >7 milliom	SL Mix	Width of Rounding Aggregate	white/ >7 milliom	SL Mix
3	N	WEARING COURSE MIXTURE (2,I	3	N	WEARING COURSE MIXTURE (2,C		Y	WEARING COURSE MI
Sealed/UTBWC	ML Thickness		Sealed/UTBWC	ML Thickness		Sealed/UTBWC	ML Thickness	
N			N			Y	4.5	
ML Top Lift / joint spacing	# Dowels per Lane		ML Top Lift / joint spacing	# Dowels per Lane		ML Top Lift / joint spacing	# Dowels per Lane	
2			1.5			6	0	
Design Life	Shldr Thickness		Design Life	Shldr Thickness		Design Life	Shldr Thickness	
15	2		20	3			4.5	

Segment 2											
SEG	Length			SEG	Length			SEG	Length		
2	5.44			2	5.44			2	5.44		
ALT	Description			ALT	Description			ALT	Description		
1		2" Mill & Fill		2		3" Mill, 3" CIR, 3" Pave		3		4.5" Whitetopping	
Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE		Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE		Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE	
HMA				HMA				PCC			
Primary Category				Primary Category				Primary Category			
Overlay, DL =13 to 17 years				20 Year HMA				6'X6' ≤ 5.0" Thickness			
Secondary Category				Secondary Category				Secondary Category			
Rural				Rural				Design Life = 20 Years			
ShoulderCategory				ShoulderCategory				ShoulderCategory			
Bituminous		Bituminous		Thick Bit							
Notes:				Notes:				Notes:			
Year	Activity	Cost	Pres. Cost/per Mile	Year	Activity	Cost	Pres. Cost/per Mile	Year	Activity	Cost	Pres. Cost/per Mile
0	2" Mill & Fill	\$ 181,881.00	\$ 181,881.00	0	3" Mill, 3" CIR, 3" Pave	\$ 302,836.00	\$ 302,836.00	0	4.5" Whitetopping	\$ 388,122.00	\$ 388,122.00
1	Crack Treatment	\$ 2,464.00	\$ -	1			\$ -	1			\$ -
2			\$ -	2			\$ -	2			\$ -
3			\$ 2,339.73	3			\$ -	3			\$ -
4			\$ -	4			\$ -	4			\$ -
5			\$ -	5			\$ -	5			\$ -
6	Seal	\$ 9,477.09	\$ -	6			\$ -	6			\$ -
7			\$ 8,399.10	7			\$ -	7			\$ -
8			\$ -	8			\$ 1,073.19	8			\$ -
9			\$ -	9			\$ -	9			\$ -
10			\$ -	10			\$ -	10			\$ -
11	ML Overlay 3.5"	\$ 236,115.34	\$ -	11			\$ -	11			\$ -
12			\$ -	12			\$ -	12			\$ -
13			\$ -	13			\$ -	13			\$ -
14			\$ -	14			\$ -	14			\$ -
15			\$ 182,283.85	15			\$ -	15			\$ -
16	Crack Treatment	\$ 2,464.00	\$ -	16			\$ -	16			\$ -
17			\$ -	17			\$ -	17			\$ -
18			\$ 1,806.30	18			\$ -	18			\$ -
19			\$ -	19			\$ -	19			\$ -
20			\$ -	20			\$ 167,220.51	20			1st CPR
21	Seal	\$ 9,477.09	\$ -	21			\$ -	21			\$ -
22			\$ 6,484.21	22			\$ -	22			\$ -
23			\$ -	23			\$ 1,657.03	23			\$ -
24			\$ -	24			\$ -	24			\$ -
25			\$ -	25			\$ -	25			\$ -
26	ML Overlay 3.5"	\$ 236,115.34	\$ -	26			\$ -	26			\$ -
27			\$ -	27			\$ -	27			\$ -
28			\$ -	28			\$ -	28			\$ -
29			\$ 143,173.93	29			\$ -	29			\$ -
30			\$ -	30			\$ -	30			Remove and Replace
31	Crack Treatment	\$ 2,464.00	\$ -	31			\$ -	31			\$ -
32			\$ 1,418.75	32			\$ -	32			\$ -
33			\$ -	33			\$ -	33			\$ -
34			\$ -	34			\$ -	34			\$ -
35			\$ (127,139.03)	\$ (69,513.35)			35	2/17 Remaining Life			\$ (27,778.28)
Net Present Cost for Segment			\$ 2,493,007.91	Net Present Cost for Segment			\$ 2,583,217.62	Net Present Cost for Segment			\$ 4,132,118.62
Maintenance - Net Present Cost for Segment			\$ 1,503,575.27	Maintenance - Net Present Cost for Segment			\$ 935,789.78	Maintenance - Net Present Cost for Segment			\$ 2,020,734.94
Equivalent Annual Cost			95,705.25	Equivalent Annual Cost			99,168.35	Equivalent Annual Cost			158,629.83

Total Lane Width	# of Lanes	Analysis Period	Total Lane Width	# of Lanes	Analysis Period	Total Lane Width	# of Lanes	Analysis Period
28	2	35	28	2	35	28	2	35
Total Shldr Width	# of Shldrs	ML Mix	Total Shldr Width	# of Shldrs	ML Mix	Total Shldr Width	# of Shldrs	ML Mix
12	2	WEARING COURSE MIXTURE (3,I	12	2	WEARING COURSE MIXTURE (3,I	12	2	
Width of Rounding Aggregate	white/ >7 milliom	SL Mix	Width of Rounding Aggregate	white/ >7 milliom	SL Mix	Width of Rounding Aggregate	white/ >7 milliom	SL Mix
4	N	WEARING COURSE MIXTURE (2,I	4	N	WEARING COURSE MIXTURE (2,C		N	WEARING COURSE MI
Sealed/UTBWC	ML Thickness		Sealed/UTBWC	ML Thickness		Sealed/UTBWC	ML Thickness	
N			N			Y	4.5	
ML Top Lift / joint spacing	# Dowels per Lane		ML Top Lift / joint spacing	# Dowels per Lane		ML Top Lift / joint spacing	# Dowels per Lane	
2			1.5			6	0	
Design Life	Shldr Thickness		Design Life	Shldr Thickness		Design Life	Shldr Thickness	
15	2		20	3			4.5	

Segment 3														
SEG	Length			SEG	Length			SEG	Length					
3	5.02			3	5.02			3	5.02					
ALT	Description			ALT	Description			ALT	Description					
1		2" Mill & Fill		2		3" Mill, 3" CIR, 3" Pave		3		4.5" Whitetopping				
Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE		Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE		Pavement Type		CLICK HERE TO EDIT THIS ALTERNATE				
HMA				HMA				PCC						
Primary Category				Primary Category				Primary Category						
Overlay, DL =13 to 17 years				20 Year HMA				6'X6' ≤ 5.0" Thickness						
Secondary Category				Secondary Category				Secondary Category						
Rural				Rural				Design Life = 20 Years						
ShoulderCategory				ShoulderCategory				ShoulderCategory						
Bituminous		Bituminous		Thick Bit										
Notes:								Notes:						
Year	Activity	Cost	Pres. Cost/per Mile	Year	Activity	Cost	Pres. Cost/per Mile	Year	Activity	Cost	Pres. Cost/per Mile			
0	2" Mill & Fill	\$ 149,364.00	\$ 149,364.00	0	3" Mill, 3" CIR, 3" Pave	\$ 256,328.00	\$ 256,328.00	0	4.5" Whitetopping	\$ 314,250.00	\$ 314,250.00			
1	Crack Treatment	\$ 2,464.00	\$ -	1			\$ -	1			\$ -			
2			\$ -	2			\$ -	2			\$ -			
3			\$ 2,339.73	3			\$ -	3			\$ -			
4			\$ -	4			\$ -	4			\$ -			
5			\$ -	5			\$ -	5			\$ -			
6	Seal	\$ 8,855.26	\$ -	6			\$ -	6			\$ -			
7			\$ 7,848.00	7			\$ -	7			\$ -			
8			\$ -	8			\$ 1,073.19	8			\$ -			
9			\$ -	9			\$ -	9			\$ -			
10			\$ -	10			\$ -	10			\$ -			
11	ML Overlay 3.5"	\$ 213,361.57	\$ -	11			\$ -	11			\$ -			
12			\$ -	12			\$ 10,656.53	12			\$ -			
13			\$ -	13			\$ -	13			\$ -			
14			\$ -	14			\$ -	14			\$ -			
15			\$ 164,717.67	15			\$ -	15			\$ -			
16	Crack Treatment	\$ 2,464.00	\$ -	16			\$ -	16			\$ -			
17			\$ -	17			\$ -	17			\$ -			
18			\$ 1,806.30	18			\$ -	18			\$ -			
19			\$ -	19			\$ -	19			\$ -			
20			\$ -	20			\$ 151,105.94	20			1st CPR	\$ 447,542.47	\$ 316,956.45	
21	Seal	\$ 8,855.26	\$ -	21			\$ -	21			\$ -			
22			\$ 6,058.75	22			\$ -	22			\$ -			
23			\$ -	23			\$ 1,657.03	23			\$ -			
24			\$ -	24			\$ -	24			\$ -			
25			\$ -	25			\$ -	25			\$ -			
26	ML Overlay 3.5"	\$ 213,361.57	\$ -	26			\$ -	26			\$ -			
27			\$ -	27			\$ 5,558.07	27			\$ -			
28			\$ -	28			\$ -	28			\$ -			
29			\$ 129,376.66	29			\$ -	29			\$ -			
30			\$ -	30			\$ -	30			Remove and Replace	\$ 339,099.63	\$ 202,104.19	
31	Crack Treatment	\$ 2,464.00	\$ -	31			\$ -	31			\$ -			
32			\$ 1,418.75	32			\$ -	32			\$ -			
33			\$ -	33			\$ -	33			\$ -			
34			\$ -	34			\$ -	34			\$ -			
35	Remaining Life	\$ (114,887.00)	\$ (62,814.54)	35	2/17 Remaining Life	\$ (25,101.36)	\$ (13,724.19)	35	30/35 Remaining	\$ (290,656.82)	\$ (158,916.82)			
Net Present Cost for Segment				\$ 2,008,578.84	Net Present Cost for Segment				\$ 2,071,525.99	Net Present Cost for Segment				\$ 3,385,456.96
Maintenance - Net Present Cost for Segment				\$ 1,258,771.56	Maintenance - Net Present Cost for Segment				\$ 784,759.43	Maintenance - Net Present Cost for Segment				\$ 1,807,921.96
Equivalent Annual Cost				77,108.27	Equivalent Annual Cost				79,524.78	Equivalent Annual Cost				129,965.89

Total Lane Width	# of Lanes	Analysis Period	Total Lane Width	# of Lanes	Analysis Period	Total Lane Width	# of Lanes	Analysis Period
28	2	35	28	2	35	28	2	35
Total Shldr Width	# of Shldrs	ML Mix	Total Shldr Width	# of Shldrs	ML Mix	Total Shldr Width	# of Shldrs	ML Mix
4	2	WEARING COURSE MIXTURE (3,I	4	2	WEARING COURSE MIXTURE (3,I	4	2	
Width of Rounding Aggregate	white/ >7 milliom	SL Mix	Width of Rounding Aggregate	white/ >7 milliom	SL Mix	Width of Rounding Aggregate	white/ >7 milliom	SL Mix
12	N	WEARING COURSE MIXTURE (2,I	12	N	WEARING COURSE MIXTURE (2,C		N	WEARING COURSE MI
Sealed/UTBWC	ML Thickness		Sealed/UTBWC	ML Thickness		Sealed/UTBWC	ML Thickness	
N			N			N	4.5	
ML Top Lift / joint spacing	# Dowels per Lane		ML Top Lift / joint spacing	# Dowels per Lane		ML Top Lift / joint spacing	# Dowels per Lane	
2			1.5			6	0	
Design Life	Shldr Thickness		Design Life	Shldr Thickness		Design Life	Shldr Thickness	
15	2		20	2			4.5	

Appendix C: Copies of LCCA Exceptions

Office Memorandum

TO: Steve Lund
Pavement Engineer

FROM: Lowell Flaten *LF*
District 8 Materials Engineer

DATE: November 26, 2014

SUBJECT: REQUEST FOR AN EXCEPTION TO SELECTING THE LOW COST ALTERNATE

SP #	4303-89
Highway #	TH 15 from Junction with TH 19 to Junction with TH 212
Project Limits	RP 76+00.891 to RP 89+00.419
Project Description	Mill 3 inches of existing bituminous pavement and construct a 3 inch bituminous overlay.

LCCA Results

Alternative	Design Life	Total Present Cost / Mile	Requested Selection	% of Low Cost
3" Mill and 3" HMA Overlay	14	\$466,348	Yes	113
4.5" Whitetopping	20	\$413,494	No	100
4.5" HMA Reconstruct	20	\$739,134	No	179

Reason for Request

The LCCA analysis was developed using District construction costs provided by Maplewood MnDOT Office. The low cost option was the 4.5" Whitetopping (concrete) fix with a Total Present Worth of \$413,494 and an Equivalent Annual Cost of \$17,064. The 3" mill and 3" HMA overlay had an Equivalent Annual Cost of cost of \$19,245 The HMA option was chosen because it does not require a detour, while the white topping option does. This detour would add 15 miles for traffic on TH 15, if the detour remains on the Trunk Highway system. It would add 5.5 miles if the county road system is utilized with 14 miles being on a county road.

The life cycle cost analysis is located in EDMS (DOC#1441878).

Jon Huseby
District Engineer

12-1-2014
Date



Minnesota Department of Transportation

Memo

District 2

3920 Highway 2 West
Bemidji, MN 56601

Telephone: 218-755-6586

Fax: 218-755-6512

Date: August 12, 2014

To: Steve Lund, Pavement Program Engineer

For: Craig Collison, District Engineer, District 2 *CC*

From: James Bittmann, Materials Engineer, District 2

Subject: **Alternate Bid Exception**
S.P. 6005-61, TH 2 EB
Letting Date – 2/27/15

District 2 is requesting be exempted this from the alternate bid process. This project is a bituminous section of road from Fosston to approximately 2.75 miles east along the Eastbound Lanes. The district is requesting to keep this section bituminous and remove any consideration of concrete as a repair.

This is a rural 4-lane section that is deep strength asphalt with 10" of sand and 2" of gravel under it. It currently has approximately 11" of bituminous on top of it. While this section meets the requirements for an alternative bid, having a short section of concrete located in an area where the surrounding pavements likely will remain bituminous creates challenges from a maintenance standpoint. The section to the west is an urban section in Fosston that was reconstructed in 2000 using bituminous. The section to the east is bituminous in both directions, with both of them on track for nothing more than a mill and overlay in the near future.

The maintenance concerns are mainly around the winter maintenance. Concrete tends to act differently than Bituminous when it involves plowing and keeping lanes bare. This becomes a challenge to keep this section to a similar level of service in reference to snow and ice, especially when the section is location a considerable distance from the truck station that does snow and ice activities. The other piece of this is driver safety and expectations. The drivers tend to drive to the conditions and if those conditions change for a short section of roadway, D2's experience that the change in pavement type causes more crashes.

The district has let three alternate bid projects in the past 4 years that range from 10.405 to 15.960 miles long and received no concrete bids on these projects. The district is letting an alternate bid project next year that is 21.809 miles long

The nearest location for concrete aggregate is about 30 miles away from this project, which will increase the cost of concrete and the small quantity of concrete for this project will also increase the cost of the concrete.

I concur:

Steve Lund, Mn/DOT Pavement Engineer, OMRR

Office Memorandum

TO: Curt Turgeon
Pavement Engineer

FROM: Graig Gilbertson *GG*
Materials Engineer

DATE: November 19, 2015

SUBJECT: REQUEST FOR AN EXCEPTION FROM THE LOW COST SELECTION

	7506-17
	59
	RP 168+00.063 to RP 178+00.710
	Grading, bituminous mill, concrete overlay, and bituminous surfacing

LCCA Results

Alternative	Length (ft)	Cost (\$)	Feasible	Score
2" Mill & 2" HMA Overlay	15	\$4,594,088.46	No	100.0
3" Mill, 3" CIR, & 3" HMA	20	\$4,756,272.38	No	103.5
1.5" Mill & 4.5" PCC Overlay	20	\$7,665,238.76	Yes	166.9

Reason for Request

A plan to deploy more Whitetopping projects across the state were decided at the December 18th Operations Division Managers meeting. On December 23, 2014 a notice was sent out by Glenn Engstrom (OMRR Director) asking each district to lay out a plan to deploy more Whitetopping projects.

This roadway was originally planned for a mill and bituminous overlay and the district decided to change the rehab to a thin Whitetopping project to meet the goals of the Operations Division Managers.

This project was regraded in 1999 with 5" of bituminous, 6" of aggregate base, and 3 feet of select granular material.

This project is an ideal candidate for thin Whitetopping since this project has no bituminous overlays and there is 3 feet of select granular material under the pavement structure.

The district request an exception to the LCCA low-cost alternate and use the thin Whitetopping alternate, to meet the goals the Operations Division Managers.

Curt Turgeon
Pavement Engineer

11/25/15
Date