

Minnesota Department of Transportation Report to Legislature on Life-Cycle Cost Analyses

January 2013









Your Destination...Our <u>Priority</u>

















Minnesota Department of Transportation Report to the Legislature on Life-Cycle Cost Analyses

To request this document in an alternative format, please contact the Affirmative Action Office at 651-366-4723 or 1-800-657-3774 (Greater Minnesota); 711 or 1-800-627-3529 (Minnesota Relay). You may also send an e-mail to ADArequest.dot@state.mn.us.

Report Development Cost

As required in Minnesota Stat. § 3.197, this document must contain the cost of preparing the report, including any costs incurred by another agency or another level of government.

Minnesota Department of Transportation staff costs were less than \$2,000 to produce this report.

Introduction

This report is required by Minnesota Stat. § 174.185. The statute requires a life-cycle cost analysis for every project in the reconditioning, resurfacing and road repair funding categories. The LCCA is a comparison of life-cycle costs among competing paving materials using equal design lives and equal comparison periods. A LCCA is required for all projects constructed after July 1, 2011.

Documentation required by the statute includes:

- Lowest life-cycle cost
- Alternatives considered.
- Chosen strategy
- Documented justification, if the chosen strategy isn't the low cost

Implementation

MnDOT has had a process for performing LCCA on roadway rehabilitation projects since 1999. The existing LCCA process, presented in Technical Memorandum 07-17-MAT-01 was modified to meet the detailed requirements of the legislation and presented in Technical Memorandum 10-04-MAT-01.

This memorandum requires that an LCCA, that is consistent with Federal Highway Administration guidelines, is performed on all projects in the reconditioning, resurfacing and road repair funding categories. The memorandum

















limits the LCCA requirement to projects greater than two miles in length or more than 30,000 square yards. The memorandum also limits the requirement for an LCCA to projects that include placing more than 2-inch thickness of pavement material. Thin overlays (2 inches or less) are considered as short-term preventive maintenance and do not have a viable concrete alternative with an equal design life.

The memorandum requires that the LCCA includes 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 memorandum also allows the LCCA to include additional alternatives with other design lives.

Results

In 2012, 45 let projects were in the reconditioning, resurfacing and road repair funding categories that required an LCCA, according to Technical Memorandum 10-04-MAT-01.

HMA options are the low-cost option for 40 of the submitted LCCAs. PCC options are the low-cost option for five of the submitted LCCAs.

Two projects have a signed exception form, because an option other than the low-cost option was selected for construction.

Seven projects did not select an option for construction because the selected option will be determined by the alternate bidding process.

Attached is a table of LCCA results and copies of the LCCAs submitted by MnDOT districts.

Discussion

Typically, HMA is the low cost option in the submitted LCCAs. Often it's difficult for PCC options to be competitive with HMA options for projects in these funding categories. PCC options usually have a greater initial cost than HMA options but become competitive by having lower maintenance costs. The relatively short design lives of these rehabilitation-type projects do not allow the PCC options to exploit their relative advantage with HMA options. PCC options that have longer design lives than HMA alternates are more competitive than PCC options with the equal design lives that are required by the statute.

PCC options may be hindered by MnDOT's limited experience with the performance and design of thin PCC options. To address these challenges, MnDOT continues to gain experience with the performance of PCC overlay projects and to research PCC design tools. Currently, MnDOT leads a pooled-fund study for the design of thin PCC overlays over existing HMA and has initiated a project to develop a new design tool for new PCC pavements and PCC overlays of existing PCC.

To create competition and to get the most cost-effective pavement design and materials, MnDOT has continued using the alternate bidding process. A LCCA is still performed as required by Technical Memorandum 10-04-MAT-01, but the option that is constructed is selected through the alternate bidding process.

















The Alternate Bidding process is used on projects with pavement ≥4" to ≤7" thick, which are likely to have competitive HMA and PCC options.

The alternate bidding process is similar to using an 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 alternate bidding process is as follows:

- 1. MnDOT lets a project with two options, one HMA and one PCC.
- 2. MnDOT calculates an adjustment factor. This is the difference between the maintenance costs of the two options.
- 3. MnDOT receives bids and determines the low-cost bidder after adding the adjustment factor to the alternate with the greatest maintenance costs.

Conclusion

MnDOT implemented the requirements of the law with a technical memorandum and has provided the required results. MnDOT will work to ensure that all future projects meet the requirements of the technical memorandum and legislation. In addition, MnDOT has introduced the alternate bidding process to create competition to get the most cost-effective pavement design and materials.

MnDOT will continue to provide this report on an annual basis as required by the legislation.

Attachments

- Technical Memorandum 10-04-MAT-01: Implements requirements of legislation
- LCCA summary: A summary of all the LCCAs in the required funding categories for projects let in 2012
- Individual project LCCAs and signed exception forms in state project number order



















MINNESOTA DEPARTMENT OF TRANSPORTATION Policy, Safety, and Strategic Initiatives Division Technical Memorandum No. 10-04-MAT-01

January 28, 2010

To: Distribution 57, 612, 618, 650

From: Khani Sahebjam

Deputy Commissioner and Chief Engineer

Subject: Life Cycle Cost Analysis (LCCA) of Pavement Preservation Projects

Expiration

This Technical Memorandum supersedes Technical Memorandum No. 07-17-MAT-01. It will remain in effect until January 28, 2015 unless it is superseded.

Implementation

This technical memorandum applies to all *pavement* preservation projects in the reconditioning, resurfacing, and road repair funding categories. Projects that meet the criteria of the Pavement Selection Process will continue to follow that process.

Introduction

To comply with the requirements of legislation and Mn/DOT policy; a Life Cycle Cost Analysis (LCCA) must be submitted with the project Materials Design Recommendation (MDR). The submitted LCCA must include at least one PCC and one HMA option with equal pavement design lives (in years) and analysis periods.

Purpose

This Technical Memorandum implements the requirements of Minnesota state legislation for LCCA of alternate pavement materials and updates LCCA procedures required by Mn/DOT policy.

In 2008, the Minnesota State Legislature passed bill HF 3486 (Chapter 287). This legislation requires a life cycle cost analysis (LCCA) be performed for all pavement projects in the reconditioning, resurfacing, and road repair funding categories that are to be constructed after July 1, 2011. The LCCA are to use equal design lives and equal comparison periods to compare competing paving materials. If the chosen option does not have the lowest life cycle cost, the justification is required to be documented. The legislation requires that the commissioner report annually to members of the Senate and House of Representatives the results of the analyses. The full text of the legislation that applies to the requirement for LCCA is attached in Appendix A.

Guidelines

A LCCA is not required for preventive maintenance projects or for short projects. Preventive maintenance projects include projects that place 2" or less of paving material. Short projects meet the following criteria:

Two-Lane Roadways: Projects less than 2 miles long

Multi-Lane Roadways: Projects less than 30,000 square yards

Technical Memorandum No. 10-04-MAT-01 Life Cycle Cost Analysis (LCCA) of Pavement Preservation Projects January 28, 2010 Page 2 of 4

The project length/size listed above is determined using only the driving lanes, no turn lanes, parking lanes or ancillary lanes.

Follow sections I and II to develop a LCCA to submit with the MDR. However, to make the best use of LCCA, perform the LCCA early in the project development process.

I. Procedure

1. Establish Design Life and Pavement Design Alternatives

For all LCCA, develop at least one HMA and one PCC pavement design alternative with equal design lives. The alternatives should be pavement designs that are capable of meeting the design life required by the scope of the project and meet Mn/DOT pavement design policy and procedures. However, the design life that best meets the scope of the project may have only one available pavement material alternate that conforms to Mn/DOT pavement design policies and procedures. In such a case, compare the alternate design with the selected design life to at least one HMA and one PCC pavement alternate developed using the closest available design life that provides both a HMA and a PCC alternate.

2. Determine Activity Timing

- Use District experience, Pavement Manual – Appendix E, and/or HPMA data.

3. Estimate Costs

- Only costs that demonstrate the differences between alternatives need to be explored.
- The District will develop the initial and activity costs based on their data and experience.
- Do not include user costs.

4. Compute Life Cycle Costs

- Calculate the present worth, of the initial construction and maintenance activities, of each of the pavement alternatives on a cost per mile basis.
- The present worth will be calculated using a discount rate equal to the real interest rate on 30-year treasury bonds as published each year by the federal Office of Management and Budget (OMB). The value to be used each year will be determined by the Mn/DOT Office of Investment Management and kept on file in the Mn/DOT Estimating Unit.
- Include any remaining life value of the pavement alternative that remains at the end of the analysis period. Remaining life value is calculated as the prorated share of the cost of the last activity based on the service life that extends past the analysis period.
- Do not include an inflation rate.

5. Analyze Results

- Unless there is justification for an exception, choose the low cost alternative. If the chosen alternative does not have the lowest life cycle cost, the District Engineer or designee shall sign off on the supporting justification.

Technical Memorandum No. 10-04-MAT-01 Life Cycle Cost Analysis (LCCA) of Pavement Preservation Projects January 28 2010 Page 3 of 4

II. Pavement Alternatives

HMA Overlay

Description

HMA overlay (or mill and overlay) of existing HMA or PCC pavement that will restore ride
and reduce pavement distresses. The thickness of a HMA overlay may be designed to
improve the load carrying capacity of an existing roadway so that it does not require a
seasonal load restriction.

Design

To remove the requirements for spring load restrictions on a roadway, Mn/DOT has a thickness design procedure based on FWD pavement deflections. A design life is not part of this design procedure. For design life, there is no formal design procedure as the performance of the overlay is very dependent on the condition of the existing pavement. Instead of a design life, HMA overlays have an expected life. Base the expected life on HPMA data and engineering judgment. The expected life of a HMA overlay is typically from 7 to 19 years.

LCCA

- Schedule the 1st overlay or reconstruction at the end of the overlay's functional life.
- Each successive overlay has 1 year less life then the previous overlay.
- Minimum of a 35 year analysis period.

HMA on Base (No Work on Subgrade)

Description

- These projects place HMA on new or existing material that behaves as base in the pavement section. These types of projects include CIR, FDR, crack and seat, full mill and repave, or new base without working the subgrade. Typically, very specific engineering requirements need to be met to make these options practical. Only consider the options that are practical in the LCCA.

Design

- Design these pavements with the Mn/DOT procedures used for new HMA pavement. Some adjustments may need to be made for the properties of the base.
- Design these projects to carry 20 years of accumulated traffic loading.

LCCA

- Use the maintenance schedule provided in the pavement selection memo.
- Minimum of a 35 year analysis period.

PCC Overlay

Description

- These projects place PCC on existing HMA (whitetopping) or existing PCC with a stress relief layer (unbonded overlay). A PCC overlay will functionally and structurally improve an existing pavement.

Technical Memorandum No. 10-04-MAT-01 Life Cycle Cost Analysis (LCCA) of Pavement Preservation Projects January 28, 2010 Page 4 of 4

Design

- Follow Mn/DOT design procedures for either whitetopping or unbonded overlays.
- The design life of these projects may be from 15-35 years.

LCCA

- If the Mn/DOT design procedure results in a thickness less than the minimum PCC thickness allowed by Mn/DOT policy, contact the Pavement Design Unit.
- An intermediate minor CPR project may add an additional 5 years until major CPR or replacement is required.
- For PCC overlay projects, the pavement should receive its first major CPR or reconstruction at the end of its design life.
- Use a life expectancy of about half the pavement design life for major CPR.
- Minimum of a 35 year analysis period.

PCC Pavement (No Work on Subgrade)

Description

- These projects place new PCC pavement on new or existing base and do not involve working the subgrade.

Design

- Follow Mn/DOT design procedures for PCC pavement.
- The preferred design life is 35 years for these projects.

LCCA

- For 35 year designs, use the maintenance schedule provided in the pavement selection memo
- For designs for less than 35 years, follow the same maintenance schedule guidelines as for PCC overlays.
- Use a 50 year analysis period.

Questions

Contact Jerry Geib, **Pavement Design Engineer, at (651) 366-5496**, for information on the technical contents of this memorandum.

Any questions regarding publication of this Technical Memorandum should be referred to the Design Standards unit, designstandards@dot.state.mn.us. A link to all active and historical Technical Memoranda can be found at http://www.dot.state.mn.us/design/tech-memos/index.html.

To add, remove, or change your name and/or address on the Technical Memoranda mailing list, write or call the Mn/DOT Central Office Mail Room G-18 Transportation Building, 395 John Ireland Blvd., St. Paul, MN 55155, phone number (651) 366-3051.

Appendix A

Sec. 71. [174.185] PAVEMENT LIFE-CYCLE COST ANALYSIS.

Subdivision 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.

SP #	EXISTING PAVEMNT	EXCEPTION	DESIGN LIFE	OPTION DESCRIPTION	PRESENT WORTH/RDWY MILE	OPTION MATERIAL		ALTERNATE BID
0106-29	НМА	No	15	3.5" HMA Overlay	\$364,850.00	НМА	✓	
			15	5" PCC Overlay	\$468,151.00	PCC		
			20	FDR w/ 3" HMA	\$428,790.00	НМА		
0208-146	НМА	No	15	6.5" PCC Overlay	\$693,056.00	PCC		
			15	4" HMA Overlay	\$565,277.00	HMA		
			35	8" PCC Overlay	\$554,518.00	PCC	✓	
0705-21	НМА	No	16	3.5" HMA Overlay	\$467,936.00	НМА	✓	
0,00 21	11177	140	20	HMA Reconstruction	\$915,604.00	HMA		
			20	PCC Overlay	\$571,359.00	PCC		
0708-35	PCC	No	14	4" HMA Overlay	\$544,536.00	HMA	✓	
			20	HMA Reconstruction	\$1,909,266.00	HMA		
			20	6.5 " PCC Overlay	\$707,685.00	PCC		
0980-139	PCC	No	10	2" HMA Overlay	\$502,784.00	НМА		
			20	8" New HMA	\$603,996.00	HMA		
			20	7.5" PCC Overlay	\$482,920.00	PCC		
			30	8.5" PCC Overlay	\$479,080.00	PCC	✓	
1002-89	НМА	No	15	4" HMA Overlay	\$389,163.00	НМА	✓	
			15	6" PCC Overlay	\$571,365.00	PCC		
1212-30	HMA	No	20	7.5" PCC Overlay	\$1,137,306.00	PCC		Yes
			20	8" New HMA	\$719,756.00	HMA	√	
			35	8" PCC Overlay	\$1,098,922.00	PCC	✓	
1301-113	PCC	No	15	4" HMA Overlay	\$526,782.00	HMA	✓	Yes
			20	Rubblize w/6" HMA Overlay	\$625,304.00	HMA		
			20	6" PCC Overlay	\$644,087.00	PCC	,	
			35	6" PCC Overlay	\$625,304.00	PCC	<u>✓</u>	
1306-40	HMA	No	20	FDR w/6" PCC	\$529,087.00	PCC		Yes
			20	FDR w/ 6" HMA Overlay	\$622,862.00	HMA	√	
			35	FDR w/7" PCC	\$525,191.00	PCC	<u> </u>	
1901-168	HMA	No	15	4" HMA Overlay	\$402,421.00	HMA	✓	
			15	6" PCC Overlay	\$535,314.00	PCC		
			20	6.5" PCC Overlay	\$463,761.00	PCC		
2102-54	HMA	No	15	6.5 PCC Overlay	\$570,363.00	PCC		
			15	3" HMA Overlay	\$230,219.00	НМА	✓	
2401-39	PCC	No	15	4.5" HMA Overlay	\$205,915.00	НМА	✓	
			15	6" PCC Overlay	\$332,069.00	PCC		
2212-28	НМА	No	20	FDR w/HMA Overlay	\$537,829.00	НМА	✓	
			20	FDR w/PCC Overlay	\$749,431.00			

SP#	EXISTING PAVEMNT	EXCEPTION	DESIGN LIFE	OPTION DESCRIPTION	PRESENT WORTH/RDWY MILE	OPTION MATERIAL	SELECTED OPTION	ALTERNATE BID
2404-39	PCC	No	15	3.5" HMA Overlay	\$171,218.00	НМА	✓	
			20	6" PCC Overlay	\$448,460.00	PCC		
			20	4.5" HMA Overlay	\$216,379.00	НМА		
2722-81	НМА	No	15	4.5" HMA Overlay	\$461,799.00	НМА	✓	
			20	7" PCC Overlay	\$555,098.00	PCC		
			20	6" HMA Overlay	\$463,554.00	НМА		
2774-21	PCC	No	15	5" PCC Overlay	\$611,113.00	PCC		
			15	3.5" HMA Overlay	\$524,483.00	HMA	√	
2785-367	HMA	No	15	7" PCC Overlay	\$824,423.00	PCC		
			15	4" HMA Overlay	\$549,042.00	HMA	√	
2804-33	PCC	No	15	3" HMA Overlay	\$261,014.00	HMA	✓	
			20	8.5" PCC Overlay	\$470,554.00	PCC		
			20	5" HMA Overlay	\$305,451.00	HMA		
3280-117	PCC	No	14	3" HMA Overlay	\$351,956.00	НМА	✓	
			20	6 "PCC Overlay	\$899,205.00	PCC		
			20	CIR w/4" HMA Overlay	\$601,290.00	HMA		
3309-14	HMA	No	15	4" HMA Overlay	\$367,055.00	HMA	✓	Yes
			20	FDR w/5" HMA	\$430,529.00	HMA		
			20	5.5" PCC Overlay	\$482,274.00	PCC	✓	
3602-25	HMA	No	20	5" PCC Overlay	\$580,737.00	PCC		
			20	3" HMA Overlay	\$217,415.00	HMA	✓	
3604-72	НМА	No	17	3" HMA Overlay	\$385,951.00	HMA	✓	
			17	5" PCC Overlay	\$569,402.00	PCC		
			20	New HMA	\$787,437.00	HMA		
			20	FDR w/ HMA Overlay	\$502,555.00	НМА		
3706-39	НМА	No	20	7" PCC Overlay	\$1,071,274.00	PCC		
			20	8" New HMA	\$636,966.00	HMA	✓	Yes
			35	8" PCC Overlay	\$912,789.00	PCC	✓	
4405-26	HMA	No	15	3" HMA Overlay	\$326,249.00	HMA	✓	
			15	5" PCC Overlay	\$465,110.00	PCC		
			20	4.5" New HMA	\$383,222.00	HMA		
			35	6" PCC Overlay	\$560,891.00	PCC		
4507-48	PCC	No	20	6" PCC Overlay	\$687,913.00	PCC		
			20	5" HMA Overlay	\$369,817.00	HMA	✓	
			35	6.5" PCC Overlay	\$596,447.00	PCC		
4705-42	НМА	No	13	3" HMA Overlay	\$497,794.00	HMA	✓	
			15	6.5" PCC Overlay	\$673,474.00	PCC		
			15	4.5" HMA Overlay	\$554,729.00	HMA		

TING EMNT	EXCEPTION	DESIGN LIFE	OPTION DESCRIPTION	PRESENT WORTH/RDWY MILE	OPTION MATERIAL	SELECTED OPTION	ALTERNATE BID
MA	No	9	2" HMA Overlay	\$427,792.00	НМА		
		15	3.5" HMA Overlay	\$415,072.00	HMA	✓	
		15	8.5" PCC Overlay	\$623,592.00	PCC		
СС	No	15	4" PCC Overlay	\$1,014,390.00	PCC		
		15	4.5" HMA Overlay	\$463,450.00	HMA	✓	Yes
		35	6" PCC Overlay	\$968,310.00	PCC	✓	
сс	No	15	3" HMA Overlay	\$772,767.00	НМА	✓	
		20	Rubblize w/HMA Overlay	\$939,220.00	HMA		
		20	6" PCC Overlay	\$791,500.00	PCC		
СС	No	17	4.5" HMA Overlay	\$303,561.00	НМА	✓	
00	NO	20	9" PCC Overlay	\$420,854.00	PCC		
		20	5.5" HMA OVERLAY	\$344,646.00	HMA		
MA	Yes	13	3" HMA Overlay	\$237,547.00	НМА		
	.00	15	4.5" HMA Overlay	\$282,952.00	HMA	✓	
		15	4" HMA Overlay	\$261,835.00	HMA		
		15	5.5" PCC Overlay	\$500,667.00	PCC		
		25	5.5" New HMA	\$401,129.00	HMA		
СС	No	20	5" PCC Overlay	\$570,548.00	PCC		
		20	3" HMA Overlay	\$279,456.00	НМА	✓	
MA	No	15	4.5" HMA Overlay	\$268,815.00	НМА	√	
IVIA	NO	15	6" PCC Overlay	\$467,412.00	PCC	·	
	N-	15	211 LIMA Overslavi	¢227.757.00	11040	✓	
MA	No	15 15	3" HMA Overlay 5.5" PCC Overlay	\$237,757.00 \$497,299.00	HMA PCC	•	
CC	No	12	3.5" HMA Overlay	\$548,693.00	HMA	✓	
		13	6" HMA Overlay 7" PCC Overlay	\$573,536.00	HMA PCC		
		15 20	FDR w/ 6" HMA	\$575,040.00 \$628,512.00	HMA		
		20	FDR w/6" PCC	\$678,411.00	PCC		
СС	No	15	3.5" HMA Overlay	\$300,554.00	НМА	✓	
CC	NO	15	6" PCC Overlay	\$500,796.00	PCC	•	
NAA	Voc						
MA	Yes	16	4" HMA Overlay	\$409,995.00	HMA	./	
						٧	
			_				Voc
			_				Yes
						✓	
						•	
			20 35 25 35 35 20	35 PCC Overlay 25 PCC Overlay 35 FDR w/ PCC 35 FDR w/ PCC	35 PCC Overlay \$394,901.00 25 PCC Overlay \$439,398.00 35 FDR w/ PCC \$504,521.00 35 FDR w/ PCC \$463,900.00	35 PCC Overlay \$394,901.00 PCC 25 PCC Overlay \$439,398.00 PCC 35 FDR w/ PCC \$504,521.00 PCC 35 FDR w/ PCC \$463,900.00 PCC	35 PCC Overlay \$394,901.00 PCC 25 PCC Overlay \$439,398.00 PCC 35 FDR w/ PCC \$504,521.00 PCC 35 FDR w/ PCC \$463,900.00 PCC ✓

SP#	EXISTING PAVEMNT	EXCEPTION	DESIGN LIFE	OPTION DESCRIPTION	PRESENT WORTH/RDWY MILE	OPTION MATERIAL	SELECTED OPTION	ALTERNATE BID
7306-95	НМА	No	15	3.5" HMA Overlay	\$339,316.00	HMA	✓	
			20	5" HMA Overlay	\$383,748.00	HMA		
			20	5" PCC overlay	\$594,818.00	PCC		
7307-12	НМА	No	9	1.5" HMA Overlay	\$246,116.00	НМА		
			15	5" PCC Overlay	\$410,085.00	PCC		
			15	3" HMA Overlay	\$234,988.00	НМА	✓	
7326-14	НМА	No	15	3" HMA Overlay	\$281,544.00	НМА	✓	
			15	5" PCC Overlay	\$489,128.00	PCC		
			20	FDR w/ 6" HMA Overlay	\$380,347.00	HMA		
			20	FDR w/ 7" PCC Overlay	\$558,274.00	PCC		
7380-238	PCC	Yes	12	6" HMA	\$647,222.00	НМА		
			12	6" PCC Overlay	\$634,852.00	PCC		
			15	6" SMA Overlay	\$777,417.00	HMA		
			15	7" PCC Overlay	\$622,422.00	PCC		
			30	9" PCC Overlay	\$624,570.00	PCC	✓	
8304-113	PCC	No	14	3" HMA Overlay	\$625,384.00	HMA	✓	
			20	7" PCC Overlay	\$949,236.00	PCC		
			20	New HMA	\$1,921,621.00	HMA		
8501-61	PCC	No	15	3" HMA Overlay	\$261,014.00	НМА	✓	
			20	5" HMA Overlay	\$305,451.00	HMA		
			20	7.5" PCC Overlay	\$575,706.00	PCC		
8711-89	НМА	No	15	6" PCC overlay	\$1,019,371.00	PCC		
			15	3" HMA Overlay	\$359,495.00	HMA	✓	
			20	4.5" HMA Overlay	\$367,985.00	НМА		
8821-153	НМА	No	15	3.5" HMA Overlay	\$272,176.00	НМА	✓	
			20	5" HMA Overlay	\$279,809.00	HMA		
			20	5" PCC Overlay	\$403,843.00	PCC		

Definitions:

 HMA Hot-Mix Asphalt

PCC

FDR

Portland Cement Concrete
Full-Depth Reclamation (recycle existing HMA and Base as new base)
Stabilized Full-Depth Reclamation (recycle existing HMA and Base as new base w/ a stabilizer)
Cold-in-Place Recycling (Recycle a layer of existing HMA with Cold-Mix Asphalt) SFDR

CIR

District	3
Performed By	CD
Analysis Period Discount Rate	35
Discount Rate	2.84
<u> </u>	

Project Number	01	06-29	
Date	6/1	5/2011	1
Funding Category	RS	•	
Low Cost Option #		1	
Chosen Option #			

		OPTION #1						OPTION #2						OPTION #3			
		DESCRIPTION		+				DESCRIPTION									
		2.0" Mill and 3.5" Overlay		╅				5.0" Whitetopping						MII 3.0", Reclaim 6", Pave 5.5'	1		
		DESIGN LIFE	TYPE					DESIGN LIFE	Τv	PE				DESIGN LIFE	TYPE		
		15		~				15		CC ▼				20	BIT	_	
Year #	Life		Cost/Mile		/ear	#	Life			Cost/Mile	Year	#	Life			ost/Mile	
0		2.0" Mill and 3.5" Overlay	\$ 182,14		0			5.0" Whitetopping	\$	292,683	0			MII 3.0", Reclaim 6", Pave 5.5"	\$	325,764	
1		,	\$ -		1			11 0	\$	-	1			,	\$	-	
2			\$ -		2				\$	-	2				\$	-	
3			\$ -		3				\$	-	3	_			\$	-	
4		Crack Treatment	\$ 4,00	_	<u>4</u> 5				\$	-	4				\$	-	
5 6		Seal Coat	\$ 25,00	10	6				\$	<u> </u>	5 6			Crack Treatment	\$	4,000	
7			\$ -		7				\$	-	7			Surface Treatment	\$	25,000	
8			\$ -		8				\$	-	8				\$	-	
9			\$ -		9				\$	-	9				\$	-	
10			\$ -		10				\$	-	10				\$	-	
11			\$ -		11			Minor CDD	\$	40.000	11				\$	-	
12 13			\$ - \$ -		12 13			Minor CPR	\$	40,000	12 13				\$	-	
14			\$ -		14				\$		14				\$	-	
15		2.0" Mill and 2.0" Overlay	\$ 112,45	52	15				\$	-	15				\$	-	
16		•	\$ -		16				\$	=	16				\$	-	
17			\$ -		17				\$	-	17				\$	-	
18			\$ -		18				\$	-	18				\$	-	
19 20		Crack Treatment Seal Coat	\$ 4,00		19	-		Major CPR	\$	150,000	19 20			2.0" Mill and 2.0" Overlay	\$	- 112.452	
21		Sear Coat	\$ 25,00	0	20 21			Major CPR	\$	150,000	21			2.0 Mili and 2.0 Overlay	\$	112,452	
22			\$ -		22				\$	<u> </u>	22				\$	-	
23			\$ -		23				\$	-	23			Crack Treatment	\$	4,000	
24			\$ -		24				\$	=	24			Surface Treatment	\$	25,000	
25			\$ -		25				\$	-	25				\$	-	
26		O. SII Mill. are al. O. SII Overalare	\$ -		26				\$	-	26				\$	-	
27 28		2.5" Mill and 2.5" Overlay	\$ 139,43 \$ -	59	27 28				\$	-	27 28				\$	-	
29			\$ -		29				\$	<u>-</u>	29				\$	-	
30			\$ -		30			Remove and Replace Concrete	\$	339,616	30				\$	-	
31		Crack Treatment	\$ 4,00	00	31			•	\$	· -	31				\$	-	
32		Seal Coat	\$ 25,00	00	32				\$	-	32				\$	-	
33			\$ -		33				\$	-	33				\$	-	
34 35		Remaining Service Life Value**	\$ -	001	34 35			Remaining Service Life Value**	\$	(227,543)	34 35			Remaining Service Life Value**	\$	-	
33		Remaining Service Life value	Φ (21,00	00)	33			Remaining Service Life value	Φ	(221,343)	33			Remaining Service Life value	Φ	-	
				\exists													
				_ -					<u> </u>								
				\dashv		-			-								
				\dashv		+			1								
				十					1								
				_][
				\dashv		_			1		-						
				\dashv		-			-								
				\dashv					1								
		Total Present Worth	\$ 364,85	50				Total Present Worth	\$	468,151		<u> </u>		Total Present Worth	\$	428,790	
	ŀ	Eq. Annual Cost*	\$16,5	86			ŀ	Eq. Annual Cost*		\$21,282				Eq. Annual Cost*	Ľ	\$19,492	
		% of Low Cost	100		2 0 0 1			% of Low Cost	i	128%				% of Low Cost		118%	

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

District	Metro
Performed By	D.Palmquist
Analysis Period	35
Discount Rate	2.7

Project Number	020	8-146
Date	11/1-	4/2011
Funding Category	RD	▼
Low Cost Option #		3
Chosen Option #		

			OPTION #1						OPTION #2			OPTION #3						
			DESCRIPTION						DESCRIPTION						DESCRIPTION			
			4" mill and 4" Bituminous Overla	ıV			6.5"	Cor	ncrete Whitetopping with Concrete	e Sh	oulders		8.0"	Cor	crete Whitetopping with Concrete	e Shou	lders	
		T	DESIGN LIFE		TYPE				DESIGN LIFE	ΤY					DESIGN LIFE	TYPE		
		ľ	15	BIT					15	PC					35	BIT	~	
Year	#	Life	Description		Cost/Mile	Year	#	Life			Cost/Mile	Year	r # Life			Co	st/Mile	
0	•		Initial Cost	\$	325,000	0			Initial Cost	\$	461,000	0	_		Initial Cost	\$	521,000	
1				\$	-	1				\$	-	1				\$	-	
2				\$	-	2				\$	-	2				\$	-	
	AA	-	Crack Treatment	\$	5,000	3				\$	-	3				\$	-	
4				\$	-	- 4 - 5				\$	-	<u>4</u> 5				\$	-	
5 6	-	-		\$	-	6				\$	-	6				\$	-	
	ВА	_	Chip Seal	\$	20,000	7				\$	-	7				\$		
8	D, (Onip Codi	\$	-	8				\$	_	8				\$		
9				\$	-	9				\$	-	9				\$	-	
10				\$	-	10				\$	-	10				\$	-	
11				\$	-	11				\$	-	11				\$	-	
12				\$	-	12	BD		1st CPR (15 year)	\$	29,282	12				\$	-	
13				\$	-	13				\$	-	13				\$	-	
14 15	DD		O" MILLO E" EIL 4 E" abldes	\$	220,228	14				\$	-	14 15				\$		
16	ВВ	-	2" Mill,3.5" fill, 1.5" shldrs	\$	220,228	15 16				\$	-	16				\$		
17	_	_		\$	-	17				\$	-		BF		1st CPR (35 year)	\$	18,640	
18	AA		Crack Treatment	\$	5,000	18				\$	-	18			Tot of it (co year)	\$	-	
19				\$	-	19				\$	-	19				\$	-	
20				\$	-	20	BE		2nd CPR (15 year)	\$	143,214	20				\$	-	
21				\$	-	21				\$	-	21				\$	-	
	BA		Chip Seal	\$	20,000	22				\$	-	22				\$	-	
23				\$	-	23				\$	-	23				\$	-	
24 25	-	-		\$	-	24 25				\$	-	24 25				\$	-	
26	-	-		\$	-	26				\$	-	26				\$		
27	_	_		\$	-	27				\$	-		BG		2nd CPR (35 year)	\$	64,543	
28				\$	-	28				\$	_	28			2.14 61 11 (66) 64.17	\$	-	
29	ВВ			\$	220,228	29				\$	-	29				\$	-	
30				\$	-	30	ВН		Concrete Removal and Recon	\$	552,179	30				\$	-	
31				\$	-	31				\$	-	31				\$	-	
_	AA		Crack Treatment	\$	5,000	32				\$	-	32				\$	-	
33	_	_		\$	-	33 34				\$	-	33				\$	-	
34 35	-	_	Remaining Service Life Value**	\$	(118,584)	35			Remaining Service Life Value**	\$	(308,870)	34 35			Remaining Service Life Value**	\$	(24,824)	
33		-	Remaining Service Life value	φ	(110,304)	33			Remaining Service Life value	Ф	(300,070)	33			Remaining Service Life value	Φ	(24,024)	
\sqcup	_	_								_								
$\vdash \vdash \downarrow$	_	_								-			<u> </u>			-		
 		\dashv						-		-			┢					
$\vdash \vdash$	-	\dashv								-		-	┢					
	+	\dashv								\vdash						1		
	1	_																
	1	T																
		T	Total Present Worth	\$	565,277					\$	693,056				Total Present Worth	\$	554,518	
			Eq. Annual Cost*		\$25,168				Eq. Annual Cost*		\$30,857				Eq. Annual Cost*		\$24,689	
			% of Low Cost		102%				% of Low Cost		125%	<u> </u>			% of Low Cost		100%	

^{*} Equivalent Annual Cost is included for information only.

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

		District		7				Drainat Nurshar		070E 04						
		District Performed By	C	Bower				Project Number		0705-21 12/5/2012						
		Analysis Period	0.	35		R		Funding Category		2						
		Discount Rate		2.7				Low Cost Option #		1						
		2.000 a.m. r tato						Chosen Option #								
		OPTION #1						OPTION #2						OPTION #3		
		BIT Willi 3.5", Pave 3.5"					BIT	DESCRIPTION		PCC	_			DESCRIPTION	_	~
							311	Bit Reconstruct		PCC	·			Whitetopping		
		DESIGN LIFE	1	TYPE				DESIGN LIFE	TY	PE				DESIGN LIFE	TYPE	<u> </u>
		16		1				20		1				20		
ear #				ost/Mile	Year				_	Cost/Mile	Year					ost/Mile
0	16	Initial Construction	\$	250,137	(_	20	Initial Construction	\$	753,487	0		20	Initial Construction	\$	384,088
2			\$	-	1 2				\$	-	1 2				\$	<u> </u>
3 AA		Crack Treatment	\$	10,000	3	_			\$	-	3				\$	-
4			\$	-	4				\$	-	4				\$	-
5			\$	-	5				\$	-	5				\$	-
6 BA		Chip Seal	\$	40,000	7				\$	-	6 7				\$	-
8 8		Ornip Ocai	\$	40,000		BC		Light Crack Treatment	\$	5,000	8				\$	-
9			\$	-	9			<u> </u>	\$	-	9				\$	-
10			\$	-	10				\$	-	10				\$	-
11 12			\$	-	11	BA		Chip Seal	\$	40,000	11 12				\$	-
13			\$	-	13			Only Seal	\$	40,000		BD		20 yr whitetopping - Yr 13 fix	\$	121,355
14			\$	-	14				\$	-	14			25 yr Willietopping 11 15 lix	\$	-
15			\$	-	15				\$	-	15				\$	-
	15	2" Mill, 3.5" Overlay	\$	177,396	16				\$	-	16				\$	-
17 18			\$	-	17 18				\$	-	17 18				\$	-
19 AA		Crack Treatment	\$	10,000	19				\$	-	19				\$	
20			\$	-	20	BB	15	2" Mill, 3.5" Overlay	\$	177,396	20				\$	-
21			\$	-	21				\$	-	21				\$	-
22 BA		Chip Seal	\$	40,000	22	AA		Crack Treatment	\$	10,000	22 23				\$	-
23 BA		Chip Seai	\$	40,000	24			Crack Treatment	\$	-	23				\$	-
25			\$	-	25				\$	-		BE		20 yr whitetopping - Yr 25 fix	\$	197,457
26			\$	-	26				\$	-	26				\$	-
27			\$	-		ВА		Chip Seal	\$	40,000	27				\$	-
28			\$	-	28				\$	-	28 29				\$	<u>-</u>
30			\$	-	30				\$	-	30				\$	-
	14	2" Mill, 3.5" Overlay	\$	177,396	31				\$	-	31				\$	-
32			\$	-	32				\$	-	32				\$	-
33 AA		Crack Treatment	\$	10,000	33 34				\$	-	33 34				\$	<u> </u>
35	10			26,711.74)	35			No Remaining Service Life	\$	-	35			No Remaining Service Life	\$	
			* (-, ,				3	Ť					3 - 1 - 1	Ť	
									<u> </u>							
						1	<u> </u>						<u> </u>			
						1			+							
						-	<u> </u>		-				<u> </u>			
+						+			+				<u> </u>			
						1			+							
									1							
+						1	<u> </u>						<u> </u>			
		Total Present Worth	<u> </u>	467,936		<u> </u>	1	Total Present Worth	Φ.	915,604	-		<u> </u>	Total Present Worth	\$	571,359
		Eq. Annual Cost*	Ψ	\$20,834				Eq. Annual Cost		\$40,766				Eq. Annual Cost*	φ	\$25,43
		% of Low Cost		100%				% of Low Cos	st	196%				% of Low Cost		1229
						,			1							
		* Equivalent Annual Cost is includ **Remaining Service Life Value is										<u> </u>				

C. Bower
35
2.7

Project Number	07	08-35
Date	12/	5/2012
Funding Category	RS	~
Low Cost Option #		1
Chosen Option #		

			OPTION #1						OPTION #2						OPTION #3		
			DESCRIPTION						DESCRIPTION						DESCRIPTION		
2	2" M	ill (29	9') wide, 3.5" O/L (29' wide), 1.5" (D/L (8	8' wide)				Bit Reconstruct						6.5" Unbonded Concrete Overla	ıv	
			DESIGN LIFE		TYPE				DESIGN LIFE	TY	PE				DESIGN LIFE	TYP	E
			14	BIT					20	BI		1			20	PCC	
Year	#	Life			Cost/Mile	Year	#	Life			Cost/Mile	Year	#	Life			ost/Mile
0	_		Initial Construction	\$	266,693	0			Initial Construction	\$	1,747,149	0			Initial Construction	\$	604,683
1				\$	-	1				\$	-	1				\$	-
2				\$	-	2				\$	-	2				\$	-
3	AA		Crack Treatment	\$	10,000	3				\$	-	3				\$	-
4				\$	-	4				\$	-	4				\$	-
5				\$	-	5				\$	-	5				\$	-
6				\$	-	6				\$	-	6				\$	-
	BA		Chip Seal	\$	40,000	7				\$		7				\$	-
8				\$	-		ВС		Light Crack Treatment	\$	5,000	8				\$	-
9 10				\$	-	9 10				\$	<u> </u>	9 10				\$	-
11				\$	-	10				\$		11				\$	
12				\$	-	12	RΔ		Chip Seal	\$	40,000	12				\$	
13				\$		13	۸.		Criip Geai	\$	-0,000		BF		20 yr UBOL - Yr. 13 fix	\$	25,378
		13	2" Mill, 3.5" Overlay	\$	177,396	14				\$	-	14	5		20 yr 0202 11. 10 lix	\$	-
15		.5	, 5.0 5.5,	\$	-	15				\$	-	15				\$	-
16				\$	-	16				\$	-	16				\$	-
17	AA		Crack Treatment	\$	10,000	17				\$	=	17				\$	-
18				\$	-	18				\$	-	18				\$	-
19				\$	-	19				\$	-	19				\$	-
20				\$	-		BB	15	2" Mill, 3.5" Overlay	\$	177,396	20				\$	-
	BA		Chip Seal	\$	40,000	21				\$	-	21				\$	-
22				\$	-	22	Λ Λ		One of Tenneton and	\$	- 40.000	22				\$	-
23				\$	-	23	AA		Crack Treatment	\$	10,000	23		-		\$	-
24 25				\$	-	24 25				\$	-	24 25	BG		20 yr UBOL - Yr. 25 fix	\$	165,557
26				\$	-	26				\$		26	В		20 yi OBOL - 11. 23 lix	\$	-
	BB	12	2" Mill, 3.5" Overlay	\$	177,396	27	BA		Chip Seal	\$	40,000	27				\$	-
28			2 111111, 616 6 6 16114,	\$	-	28			5.mp 666.	\$	-	28				\$	
29				\$	-	29				\$	-	29				\$	-
	AA		Crack Treatment	\$	10,000	30				\$	-	30				\$	-
31				\$	-	31				\$	-	31				\$	-
32				\$	-	32				\$	-	32				\$	-
33				\$	-	33				\$	-	33				\$	-
	BA		Chip Seal	\$	40,000	34				\$	-	34				\$	-
35		4	Remaining Service Life Value**	\$	(58,541)	35		No	Remaining Service Life Value**	\$	-	35		No	Remaining Service Life Value**	\$	-
		1															
		H								H							
	Т									H							
										T							
		Ш								oxdot							
		Ш															
ļ																	
 	<u> </u>							_		<u> </u>			_	<u> </u>			
	-	H								-				-			
 	-	\vdash								\vdash				-			
 	_	щ	Total Present Worth	\$	544,536				Total Present Worth	đ	1,909,266	-		_	Total Present Worth	\$	707,685
			Eq. Annual Cost*	Φ	\$24,245				Eq. Annual Cost*	Φ	\$85,008				Eq. Annual Cost*	Ф	\$31,509
l			% of Low Cost		100%				% of Low Cost	H	351%				% of Low Cost		130%

^{*} Equivalent Annual Cost is included for information only.

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

1
TA check
35
2.7

Project Number	098	0980-139					
Date	1/23	1/23/2012					
Funding Category	RD	•					
Low Cost Option #		2					
Chosen Option #							

1
TA check
35
2.7

	OPTION #1				OPTION #2				OPTION #3				OPTION #4		
	DESCRIPTION				DESCRIPTION				DESCRIPTION				DESCRIPTION		
	7.5" UBOL				8.5" UBOL			2"	HMA with 5/8" Ultra Thin Wear 0	Course			8" HMA reconstruct		
	DESIGN LIFE	TYPE			DESIGN LIFE	TYPE			DESIGN LIFE	TYPE			DESIGN LIFE	TYP	E
	20	PCC 🔻			30	PCC			10	BIT ▼			20	BIT	•
Year # Li	ife Description	Cost/Mile	Year	# Lif	Description	Cost/Mile	Year :	# Life	Description	Cost/Mile	Year	# L	ife Description	(Cost/Mile
0		\$ 383,878	0			\$ 409,300	0			\$ 208,843	0			\$	466,053
1		\$ -	1			\$ -	1			\$ -	1			\$	-
2		\$ -	2			\$ -	2			\$ -	2			\$	-
3		\$ - \$ -	3 4			\$ - \$ -	3 b	b	Crack Seal	\$ 2,200 \$ -	3	\vdash		\$	-
5		\$ -	5			\$ - \$ -	5	_		\$ - \$ -	5			\$	-
6		\$ -	6			\$ -	6	_		\$ -	6			\$	-
7		\$ -	7			\$ -	7			\$ -	7			\$	-
8		\$ -	8			\$ -	8	-		\$ -	8	aa	Crack Treatment	\$	5,000
9		\$ -	9			\$ -	9			\$ -	9			\$	-
10		\$ -	10			\$ -	10 b	c 7	Thin OL	\$ 111,514	10			\$	-
11		\$ -	11			\$ -	11			\$ -	11			\$	-
12		\$ -	12			\$ -	12			\$ -	12			\$	-
13 <mark>ao</mark>	Reseal Joints (15')	\$ 9,572	13			\$ -	13 <mark>b</mark>	b	Crack Seal	\$ 2,200	13			\$	-
14		\$ -	14			\$ -	14			\$ -	14			\$	-
15		\$ -		ba	Reseal joints & minor repair	\$ 4,786	15	_		\$ -	15			\$	-
16 17		\$ - \$ -	16 17			\$ -	16 17 b		Thin Mill * OL	\$ - \$ 120,666	16 17			\$	-
18		\$ - \$ -	18			\$ - \$ -	17 D	a /	Thin Mill " OL		18			\$	-
19		\$ -	19			\$ -	19	+		\$ - \$ -	19			\$	-
20		\$ -	20			\$ -	20 b	h	Crack Seal	\$ 2,200			12 Med Mill & OL	\$	180,646
21		\$ -	21			\$ -	21		Crack Gear	\$ -	21		IZ Wed Will & OL	\$	-
22		\$ -	22			\$ -	22	_		\$ -	22			\$	_
23		\$ -	23			\$ -	23			\$ -	23			\$	-
24		\$ -	24			\$ -	24 b	e 16	Thick OL	\$ 238,515	24			\$	-
25 as	Major CPR (15')	\$ 179,611	25	aq	Minor CPR (15')	\$ 129,582	25			\$ -	25	aa	Crack Treatment	\$	5,000
26		\$ -	26			\$ -	26			\$ -	26			\$	-
27		\$ -	27			\$ -	27 <mark>b</mark>	b	Crack Seal	\$ 2,200	27			\$	-
28		\$ -	28			\$ -	28			\$ -	28			\$	-
29		\$ -	29			\$ -	29			\$ -	29			\$	-
30		\$ - \$ -	30 31			\$ - \$ -	30 31			\$ - \$ -	30 31			\$	-
32		\$ -	32			\$ -	32	-		\$ -			11 Med Mill & OL	\$	180,646
33		\$ -	33			\$ -	33			\$ -	33		I WEG WIII & OL	\$	100,046
34	<u> </u>	\$ -	34			\$ -	34			\$ -	34			\$	-
35	Remaining Service Life Value**	\$ -	35		Remaining Service Life Value**	\$ -	35		Remaining Service Life Value**	\$ -	35		Remaining Service Life Value**		(131,379)
												Ш		L	
											11				
	1						┖			1	Ⅱ ┣ <u></u>	$\sqcup \bot$		1	
	1		₩	$\vdash \vdash$.			_	∦ II—	\sqcup	_		
\vdash	+	-	├	++	+	-	!	+		+	┨╟──	\vdash	+	+	
	+		\vdash	┢			┡	+		+	H	\vdash	+	+	
 	+		\vdash	++				+		1	HH	\vdash	+	+	$\overline{}$
 	1		1	++				+		+	H		1	+	
			l	t				\top			11	H		1	
	1	Ì	t			Ì		1		1	11	\Box		1	
											11				
	Total Present Worth				Total Present Worth	\$ 479,080			Total Present Worth				Total Present Worth		603,996
	Eq. Annual Cost*	\$21,501			Eq. Annual Cost*	\$21,330	I		Eq. Annual Cost		<u> </u>		Eq. Annual Cost		\$26,892
	% of Low Cost				% of Low Cost	100%			% of Low Cos	t 105%	ــــا ك		% of Low Cos		126%
	* Equivalent Appual Cost is inclu	1 16 16 11											* Equivalent Annual Cost is incl		and the farmer of the

^{*} Equivalent Annual Cost is included for information only.

District	Metro	Dr
Performed By	A. Azarshin	Dr
Analysis Period	35	Dr
Discount Rate	2.84	Dr

Project Number	1002	-89 TH 5
Date	12/	6/2010
Funding Category	RX	~
Low Cost Option #		1
Chosen Option #		3

	Option #1			191			Option #2				
	Description	4" M	80				Description				
	Design Life (Years)		15	віті	JMINOUS 🔻		Design Life (Years)		vhitetopping 15	PCC	~
Year	Description		ost/Mile		PW/Mile	Year	Description		Cost/Mile		PW/Mile
	4" Mill and Overlay	\$	200,000	\$	200,000		6" Whitetopping	\$	300,000	\$	300,000
1	· mm and o vona)	Ť	200,000	\$	-	1	o Trintotopping	Ť	000,000	\$	-
2				\$	-	2				\$	-
3				\$	-	3				\$	-
	Crack Seal	\$	5,000	\$	4,470	5				\$	-
5 6				\$	-	6		_		\$	-
7				\$	-	7				\$	
8				\$	-	8				\$	-
9				\$	-	9				\$	-
10				\$	-	10				\$	*
11 12				\$	•	11	Minor CPR	S	100,000	\$	71,459
13				\$	-	13	WIIIOI CFK	Þ	100,000	\$	71,459
14				\$	-	14				\$	-
15	4" Mill and Overlay (2" on Sho	\$	200,000	\$	131,401	15				\$	-
16				\$	-	16				\$	
17				\$	-	17				\$	2.
18	Crook Sool	0	E 000	\$	2 027	18 19				\$	•
20	Crack Seal	\$	5,000	\$	2,937	20	Remove & Replace	\$	350,000	\$	199,906
21				\$	-	21	remove & replace	Ψ	000,000	\$	-
22				\$	-	22				\$	
23				\$	-	23				\$	-
24				\$	-	24				\$	
25				\$	-	25				\$	-
26 27				\$	-	26 27			_	\$	-
28				\$	-	28				\$	-
29	4" Mill and Overlay (2" on Sho	\$	200,000	\$	88,783	29				\$	-
30				\$	-	30				\$	-
31				\$	-	31				\$	*
32 33	Crack Soci	6	E 000	\$	4.004	32				\$	-
34	Crack Seal	\$	5,000	\$	1,984	34				\$	-
	Remaining Life	\$	(107,692)	\$	(40,412)		Remaining Life	\$	-	\$	-
			, , , , , , ,	\$	-		9			\$	-
				\$	-					\$	-
				\$	-					\$	~
				\$	-					\$	-
				\$	-					\$	-
				\$	-					\$	-
				\$	-					\$	-
				\$						\$	-
_				\$	-					\$	
_				\$	-					\$	-
				\$	-					\$	-
				\$	-					\$	-
				\$	-					\$	-
	Tota		sent Worth		389,163		Tota		esent Worth	\$	571,365
		% 0	f Low Cost		100%			%	of Low Cost		147%

District	8
Performed By	S. Pedersen
Analysis Period	35
Discount Rate	2.84

Project Number	1212-30
Date	4/12/2011
Funding Category	2
Low Cost Option #	1
Chosen Option #	0

	OPTION #1			OPTION #2				OPTION #3		
	DESCRIPTION			DESCRIPTION				DESCRIPTION		
	Stabilized Full Deph Reclam	nation		Whitetopping				Whitetopping		
	DESIGN LIFE	TYPE		DESIGN LIFE	TY	DE		DESIGN LIFE	TY	DE
-	20	111 =	1	20		2		35	+ • •	1 -
Voor		Cost/Mile	Voor			Coot/Milo	Voor			Coot/Mile
Year	Description		Year		-		Year		_	Cost/Mile
1	BAB	\$ 594,128 \$ -	1	7.5" UBOL (20 yr)	\$	986,574	1	8" UBOL (35 yr)	\$	1,007,034
2		\$ -	2		\$		2		\$	
3		\$ -	3		\$		3		\$	-
4		\$ -	4		\$	-	4		\$	-
5		\$ -	5		\$	-	5		\$	-
6	Crack Treatment	\$ 5,000	6		\$	-	6		\$	-
	Surface Treatment	\$ 25,000			\$	-	7		\$	-
8		\$ -	8		\$	-	8		\$	-
9		\$ -	9		\$	-	9		\$	-
10		\$ -	10		\$	-	10		\$	-
11 12		\$ - \$ -	11		\$	-	11 12		\$	-
13		\$ -		Minor CPR + Seal	\$	54,000	13		\$	
14		\$ -	14		\$	-	14		\$	-
15		\$ -	15	I .	\$	-	15		\$	-
16		\$ -	16		\$	-	16		\$	-
17		\$ -	17		\$	-	17	Minor CPR	\$	119,500
18		\$ -	18		\$	-	18		\$	-
19		\$ -	19	I .	\$	-	19		\$	-
	2"Mill & 2" Overlay + chip shlds	\$ 149,626			\$	-	20		\$	-
21 22		\$ - \$ -	21		\$	-	21 22		\$	-
	Crack Treatment	\$ 5,000			\$		23		\$	
	Surface Treatment	\$ 25,000			\$	-	24		\$	-
25		\$ -		Major CPR + Grind	\$	228,000	25		\$	-
26		\$ -	26		\$	· -	26		\$	-
27		\$ -	27		\$	-		Minor CPR + Seal	\$	54,000
28		\$ -	28		\$	-	28		\$	-
29		\$ -	29		\$	-	29		\$	-
30 31		\$ - \$ -	30		\$	-	30 31		\$	-
32		\$ -	32		\$		32		\$	
33		\$ -	33		\$	-	33		\$	-
34		\$ -	34		\$	-	34		\$	-
35	End of Analysis	\$ -	35	End of Analysis	\$	-	35	Remaining Service Life Value**	\$	(20,520)
			1						-	
									1	
									+	
			1							
	Total Present Worth	\$ 719,756		Total Present Worth	\$	1,137,306		Total Present Worth		1,098,922
[Eq. Annual Cost*	\$32,71		Eq. Annual Cost		\$51,700		Eq. Annual Cost		\$49,955
	% of Low Cost	100%		% of Low Cos	t	158%	<u>L</u>	% of Low Cos	t	153%

^{*} Equivalent Annual Cost is included for information only.

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

District	Metro
Performed By	D.Palmquist
Analysis Period	35
Discount Rate	2.7

Project Number	1301-113
Date	10/10/2011
Funding Category	RS
Low Cost Option #	1
Chosen Option #	

District	Metro
Performed By	D.Palmquist
Analysis Period	35
Discount Rate	2.7

		OPTION #1					OPTION #2						OPTION #3					OPTION #4		
		DESCRIPTION		ì			DESCRIPTION						DESCRIPTION					DESCRIPTION		
		4.5" Mill and 4" Bituminous Overl	lay				6" Unbonded Concrete Over	lay				F	Rubblize Concrete/6" Bituminou	S		6"	Unb	onded Concrete Overlay (Minimu	ım De	esign)
		DESIGN LIFE		TYPE			DESIGN LIFE	T	YPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYP	Ē
			ВІТ				35		ONC					BIT				20	CON	
Year	# Li	fe Description	(Cost/Mile	Year	# L	ife Description		Cost/Mile	Year	# Lit	fe	Description	Cost/Mile		Year #	Life	e Description		Cost/Mile
0		Initial Cost	\$	298,750	0		Initial Cost	\$	568,700	0		Ini	itial Cost	\$ 460	0,200	0		Initial Cost	\$	568,700
1			\$	-	1			\$	-	1				\$	-	1			\$	-
2			\$	-	2			\$		2				\$	-	2			\$	-
3	AA	Crack Treatment	\$	5,000	3			\$		3				\$	-	3			\$	-
4			\$	-	4			\$		4		_		\$	-	4	<u> </u>		\$	-
5	_		\$	-	5			\$		5	4	_		\$	-	5	4—		\$	-
6	D.A.	Ohio Ocal	\$	-	6			\$	-	6	_	_		\$	-	6	-		\$	-
7 8	BA	Chip Seal	\$	20,000	/ 8			\$		8 A	^	C:	ack Treatment	\$ 5	5,000	8	-		\$	<u>-</u>
9	-	_	\$	-	9			\$		9	A	CI	ack rreatment	\$	-	9	+		\$	
10			\$	-	10			\$		10	-	+		\$	-	10	+-		\$	
11			\$	-	11			\$		11		+		\$	-	11			\$	-
12			\$	-	12			\$		12 B	Α	CI	nip Seal		0,000	12			\$	-
13			\$	-	13			\$		13				\$	-	13 BI		1st CPR (20 year)	\$	23,426
14			\$	-	14			\$		14				\$	-	14			\$	
15	BE	2" mill/3.5" overlay/1.5" shld	\$	207,060	15			\$	-	15		I		\$	-	15			\$	-
16			\$	-	16			\$		16				\$	-	16			\$	-
17			\$	-		BF	1st CPR (35 year)	\$,	17				\$	-	17			\$	-
18	AA	Crack Treatment	\$	5,000	18			\$		18				\$	-	18			\$	-
19			\$	-	19			\$		19		_		\$	-	19	<u> </u>		\$	-
20	_		\$	-	20			\$		20 B	D	2.	5" mill/4" overlay/1.5" shld		3,450	20	4—		\$	-
21	D.A.	Ohio Onel	\$	-	21			\$	*	21		_		\$	-	21	4		\$	-
22 23	ВА	Chip Seal	\$	20,000	22			\$		22 23 A	^	C:		\$ 5	5,000	22	1		\$	-
24	-		\$	-	24			\$		23 A	A	CI	ack Treatment	\$	-	24	1		9	
25	+		\$	-	25			\$		25	+			\$	_	25 BJ	+	2nd CPR (20 Year)	\$	114,492
26			\$	-	26			\$		26	+	_		\$	-	26		Zild Of It (20 Teal)	\$	- 117,702
27	\dashv		\$	-		BG	2nd CPR (35 year)	\$		27 B	Α	CI			0,000	27	1		\$	_
28			\$	-	28			\$		28				\$	-	28			\$	-
29	BE	2" mill/3.5" overlay/1.5" shld	\$	207,060	29			\$	-	29				\$	-	29			\$	-
30			\$	-	30			\$	-	30				\$	-	30			\$	-
31			\$	-	31			\$	-	31				\$	-	31			\$	-
32	AA	Crack Treatment	\$	5,000	32			\$	-	32				\$	-	32			\$	-
33			\$	-	33			\$	-	33		1		\$	-	33			\$	-
34	4	Description Comp. 177 177 177	\$	- (444.040)	34		Develope On 1 17 17 17	\$	- (04.404)	34	4	_	and the Control of the Control	\$	-	34		Demokata Osari IV Vi	\$	-
35		Remaining Service Life Value**	\$	(111,810)	35		Remaining Service Life Value*	* \$	(24,484)	35		Re	emaining Service Life Value**	\$	-	35		Remaining Service Life Value**	\$	-
\vdash		+				⊢⊦	-	+		\vdash	+	+				 	-	 	1-	
-						H		+		\vdash	+	+				 	1		1	
-	-					\vdash		+		\vdash	+	+					1		1	
						H		+			_	+					1		1	
								\top		\Box	\top	\top							1	
	T					Ħ					1								İ	
								I				Ι								
												I								
						Ш		Ţ			\Box									
												_					1			
								_				\perp					1			
-						\vdash		+		\vdash		+				\vdash	1		1	
\vdash	_	+				\vdash	+	+		$\vdash \vdash$	+	+				\vdash	1		₽	
	!_	Tal-I December 2	•	E00 700			Taral Barrarian of		500.07:	\vdash		+	Total Process (M. 1)	e 000	5 20 4	\vdash	1	Tatal December 2	6	044.00=
		Total Present Worth Eq. Annual Cost*		526,782 \$23,454			Total Present Worth		5 593,874 \$26,441			-	Total Present Worth Eq. Annual Cost*		5,304 27,841			Total Present Worth Eq. Annual Cost		644,087 \$28,677
		eq. Annual Cost		\$23,454 100%			eq. Annual Cos % of Low Co		\$26,441 113%			\vdash	eq. Annual Cost" % of Low Cost		119%			eq. Annual Cost		\$28,677 122%
<u> </u>		* Equivalent Annual Cost is include			n onl	.,	1 /0 GI LOW CO	υL	113/0				70 OI LOW COST		113/0	<u> </u>		* Equivalent Annual Cost is inclu		

^{*} Equivalent Annual Cost is included for information only.

* Equivalent Annual Cost is included for informatic

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

District	Metro
Performed By	D.Palmquist
Analysis Period	35
Discount Rate	2.7

Project Number	130	6-40
Date	11/14	1/2011
Funding Category	RD	~
Low Cost Option #		2
Chosen Option #		

			OPTION #1						OPTION #2						OPTION #3		
			DESCRIPTION						DESCRIPTION			_			DESCRIPTION		
			6" Bit over 8": Reclaim						7" Concrete over 8" Reclaim			-			6" Concrete over 8" Reclaim		
		1	DESIGN LIFE	Π	TYPE				DESIGN LIFE	TYP	-				DESIGN LIFE	TYP	
				BIT						PCC						PCC	
Year	44	Life	20 Description		Cost/Mile	Year	44	Lifo	35 Description		cost/Mile	Year	#	Life	20 Description		ost/Mile
rear 0	_	_	Description Initial Cost	_	482,800	rear 0	#	LIIE	Initial Cost		491,700	rear 0	#	LIIE	Initial Cost	\$	453,700
1			Illitial Cost	\$	402,000	1			Irritial Cost	\$	491,700	1			Illitial Cost	\$	400,700
2				\$	-	2	\exists			\$	-	2				\$	-
3				\$	-	3				\$	-	3				\$	-
4				\$	-	4				\$	-	4				\$	-
5				\$	-	5				\$	-	5				\$	-
6				\$	-	6	_			\$	-	6				\$	-
7			Light Cook Transmit	\$	- 2.500	7	_			\$	-	7				\$	-
9	BA		Light Crack Treatment	\$	2,500	8				\$	-	8 9				\$	-
10	_			\$	-	10				\$	-	10				\$	
11				\$		11				\$	-	11				\$	
	ВВ		Chip Seal	\$	20,000	12				\$	-	12				\$	-
13				\$	-	13				\$	-		BF		1st CPR (20 year)	\$	23,426
14				\$	-	14				\$	-	14				\$	-
15				\$	-	15				\$	-	15				\$	-
16				\$	-	16	D.D.		4-1-000 (05)	\$	-	16				\$	-
17 18				\$	-	17 18	ΒD		1st CPR (35 year)	\$	18,640	17 18				\$	
19				\$	-	19	-			\$	-	19				\$	
	ВС		2.5" Mill and 4" Overlay	\$	189,226	20				\$	-	20				\$	-
21	50		2.0 Will drid 4 Overlay	\$	-	21				\$	-	21				\$	-
22				\$	-	22				\$	-	22				\$	-
23	AA		Crack Treatment	\$	5,000	23				\$	-	23				\$	-
24				\$	-	24				\$	-	24				\$	-
25				\$	-	25	_			\$	-	25	BG		2nd CPR (20 year)	\$	114,492
26	BB		Chip Seal	\$	20,000	26 27	DE		2nd CPR (35 year)	\$	64,463	26 27				\$	-
28			Chip Seai	\$	20,000	28	DE		Zilu CFR (33 year)	\$	- 04,403	28		\vdash		\$	
29				\$	-	29				\$	-	29				\$	
30				\$	-	30				\$	-	30				\$	-
31				\$	-	31				\$	-	31				\$	-
32				\$	-	32				\$	-	32				\$	-
33				\$	-	33				\$	-	33				\$	-
34			Demokratica Comitee Life Websett	\$	-	34 35	_		D	\$	- (0.4.700)	34			Demoisium Comitee Life Velscott	\$	-
35	H		Remaining Service Life Value**	\$	-	33	-		Remaining Service Life Value**	\$	(24,793)	35		┢	Remaining Service Life Value**	\$	
												_					
	T	\Box											T	T			
<u> </u>	L	Ш				Ш	_]						L	L			
<u> </u>	1	$\vdash \vdash$		_		\vdash	-			_		_	\vdash	1			
 	\vdash	\vdash		_		$\vdash\vdash$	-			-		-	\vdash	\vdash			
 	\vdash	\vdash		\vdash		\vdash				\vdash		-	\vdash	\vdash			
		H					-										
		Н															
			-														
				_													
			Total Present Worth	\$	622,862				Total Present Worth	\$	525,191				Total Present Worth	\$	529,087
			Eq. Annual Cost*	<u> </u>	\$27,732				Eq. Annual Cost*	_	\$23,383				Eq. Annual Cost*		\$23,557
ll .			% of Low Cost	l	119%	1			% of Low Cost	ĺ	100%				% of Low Cost	1	101%

^{*} Equivalent Annual Cost is included for information only.

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

LIFE CYCLE COST ANALYSIS

District	Metro
Performed By	C. Kufner
Analysis Period	35
Discount Rate	2.7

Project Number	190	1-168
Date	11/1	7/2011
Funding Category	RS	~
Low Cost Option #		1
Chosen Option #		1

			OPTION #1						OPTION #2						OPTION #3		
			DESCRIPTION						DESCRIPTION						DESCRIPTION		
		4"	Mill and 4" Bituminous Overlay (u	rbar	1)				6" mill and 6" Concrete Overlay	/					6.5" mill and 6.5" Concrete Over	lav	
		İ	DESIGN LIFE		TYPE				DESIGN LIFE	TY	PF				DESIGN LIFE	TYP	F
			15	віт					15	PC		1			20	PCC	
Year	#	Life	Description		Cost/Mile	Year	#	Life			Cost/Mile	Year	#	II ife			ost/Mile
0	#		4" m/o, 2" m/o on shoulder	\$	194,754	0	- 17	LIIC	6" mill, 6" pcc, 2" m/o shld	\$	336,347	0	π	Liic	6.5 mill, 6.5" pcc, 2" m/o shdr	\$	351,835
1			4 1100, 2 1100 off offoliation	\$	-	1			o min, o poe, z mye ena	\$	-	1			0.0 mm, 0.0 poo, 2 m/o snar	\$	-
2				\$	-	2				\$	-	2				\$	-
	aa		Crack Treatment	\$	5,000	3				\$	-	3				\$	-
4				\$	-	4				\$	-	4				\$	-
5				\$	-	5				\$	-	5		-		\$	-
7			Surface Treatment	\$	20,000	6 7				\$	-	6 7				\$	-
8	au		Surface Treatment	\$	20,000	8				\$		8		H		\$	
9				\$	-	9				\$	-	9		H		\$	-
10				\$	-	10				\$	-	10				\$	-
11				\$	-	11				\$	-	11				\$	-
12				\$	-	12	bc		Reseal and partials (12')	\$	29,283	12				\$	-
13				\$	-	13				\$	-		bc		Reseal and partials (12')	\$	29,283
14	h a		2 F! Mill 9 Overley (2! ehds)	\$	- 404 000	14				\$	-	14		-		\$	
15 16	ba		3.5" Mill & Overlay (2" shdr)	\$	181,090	15 16				\$	-	15 16		\vdash		\$	-
17				\$		17				\$		17		H		\$	
18	aa		Crack Treatment	\$	5,000	18				\$	-	18		T		\$	-
19				\$	-	19				\$	-	19				\$	-
20				\$	-	20	bd		Major CPR (2" shdr)	\$	177,553	20				\$	-
21				\$	-	21				\$	-	21				\$	-
22	ab		Surface Treatment	\$	20,000	22				\$	-	22				\$	-
23				\$	-	23 24				\$	-	23 24		-		\$	-
25				\$	-	25				\$		25	bd	\vdash	Major CPR (2" shdr)	\$	177,553
26				\$	-	26				\$	-	26	Du	H	ividioi oi it (2 siidi)	\$	-
27				\$	-	27				\$	-	27				\$	-
28				\$	-	28				\$	-	28				\$	-
29	bb		4" Mill and Overlay (2" shdr)	\$	194,754	29				\$	-	29				\$	-
30				\$	-	30	bg		rem/replace 6" pcc	\$	392,667	30		-		\$	-
31 32	00		Crack Treatment	\$	5,000	31 32	H			\$		31 32		⊢		\$	-
33	aa		Crack Treatment	\$	5,000	33				\$		33		\vdash		\$	
34				\$	-	34				\$	-	34		H		\$	-
35			Remaining Service Life Value**	\$	(104,868)	35			Remaining Service Life Value**	\$	(261,909)	35			Remaining Service Life Value**	\$	-
	L	Ш											L	L			
<u> </u>	-	$\vdash \vdash$		<u> </u>			<u> </u>			⊢		<u> </u>	-	₩		├	
-	\vdash	\vdash		\vdash			\vdash	\vdash		\vdash		_	\vdash	⊢		\vdash	
\vdash	\vdash	\vdash		\vdash		\vdash	\vdash	\vdash		\vdash		—	\vdash	\vdash		╁	
	H	Н								H			H	t		t	
														T			
	oxdot	П								oxdot			oxdot	┖			
<u> </u>	<u> </u>	Ш		L			L			L			<u> </u>	<u> </u>		<u> </u>	
\vdash	⊢	\vdash		-		\vdash	-			\vdash			⊢	⊢		₩	
\vdash	\vdash	\vdash		-		\vdash	-	\vdash		\vdash		-	\vdash	\vdash		\vdash	
	\vdash	Н								H		-	\vdash	\vdash		H	
	_	\vdash	Total Present Worth	\$	402,421		_	_	Total Present Worth	\$	535,314		_	'	Total Present Worth	\$	463,761
		ŀ	Eq. Annual Cost*	۳	\$17,917	ĺ			Eq. Annual Cost*	Ť	\$23,834				Eq. Annual Cost*	T	\$20,648
l		ı	% of Low Cost		100%				% of Low Cost		133%				% of Low Cost	l	115%

^{*} Equivalent Annual Cost is included for information only.

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

Page 3 of 13

3		<u></u>				1			·		
			District		4				Project Number		2102-54
			Performed By		SM				Date		/10/2011
			Analysis Period		35				Funding Category	RS	▼
			Discount Rate		2.7				Low Cost Option #		1
									Chosen Option #		1
			OPTION #1						OPTION #2		
			DESCRIPTION						DESCRIPTION		
			1.5" Mill and 3" Overlay						6.5" Whitetopping		
			DESIGN LIFE		TYPE				DESIGN LIFE	TYP	E
			15	ВІТ	▼				15	PCC	•
Year	#	Life		С	ost/Mile	Year	#	Life		С	ost/Mile
0		_	Initial Cost	\$	102,080	0			Initial Cost	\$	299,155
1				\$	-	1				\$	-
2				\$	-	2				\$	-
3	AA	3	Crack Treatment	\$	2,000	3				\$	-
5				\$	-	4				\$	-
	AB	0	Surface Treatment	\$	20,000	5 6				\$	<u> </u>
7	AB	9	Ouridoe Healifichil	\$	- 20,000	7				\$	
8				\$	-	8				\$	-
9				\$	-	9				\$	-
10				\$	-	10				\$	-
11				\$	-	11				\$	-
12				\$	-	12				\$	-
13				\$		13 14				\$	-
15	AK	14	3" Mill & 3" Overlay	\$	104,000	$\overline{}$	AR	8	Major CPR (6'X6')	\$	200,000
16			a a dionaj	\$	-	16				\$	-
17				\$	-	17				\$	
18	AΑ	3	Crack Treatment	\$	2,000	18				\$	-
19				\$	-	19				\$	-
20	۸.5	-	Ourford Transfer	\$	-	20				\$	-
21	AB	8	Surface Treatment	\$	20,000	21 22				\$	-
23				\$		-	ΑZ	20	New Bituminous Structure	\$	330,000
24				\$	-	24	/\Z	20	THOM DITAITINGS OFFICEIGE	\$	-
25				\$	-	25				\$	-
26				\$	-	26	AA	3	Crack Treatment	\$	2,000
27				\$	-	27				\$	-
28		(-		\$	-	28			0 / -	\$	-
	AK	13	3" Mill & 3" Overlay	\$	104,000		AB	14	Surface Treatment	\$	20,000
30				\$		30 31				\$	-
	AA	3	Crack Treatment	\$	2,000	32				\$	
33	, .		J.S.O. HOMINOIN	\$	-	33				\$	-
34				\$	-	34				\$	-
35			Remaining Service Life Value**	\$	(56,000)	35			Remaining Service Life Value**	\$	(132,000)
	<u> </u>									_	
\vdash	<u> </u>	\vdash		-				\vdash		_	
-	\vdash	\vdash						\vdash		_	
	\vdash										
		oxdot									
	<u> </u>					<u> </u>					
	-										
	\vdash										
	\vdash										
			Total Present Worth	\$	230,219				Total Present Worth	\$	570,363
			Eq. Annual Cost*		\$10,250				Eq. Annual Cost*		\$25,395
			% of Low Cost		100%				% of Low Cost		248%
			* Equivalent Annual Cost is inclu								
			**Remaining Service Life Value i	s rep	orted as a r	negati	ve v	alue	•		

		ļ.,		_						
			District	7	_ _				Project Number	2212-2
				A. Noble / c	۱.					
			Performed By / Updated by	Hager					Date	RD
			Analysis Period	35					Funding Category	4
			Discount Rate	2.5					Low Cost Option #	1
									Chosen Option #	1
			OPTION #1						OPTION #2	
			DESCRIPTION		-	╁──			DESCRIPTION	
			Reclamation with a Bituminous Surface						Reclaim with a Concrete Surface	
			DESIGN LIFE	TYPE						TYPE
			20		_	1			20	PCC
/00r	ш	l ifo		BIT Coot/Mile	▼	Voor	ш	Life		
/ear			Description	Cost/Mile		Year	#			Cost/M
0			Initial Construction	\$389,2		0			Initial Construction	\$63
1					\$0	1				
2					\$0	2				
3					\$0	3				
4					\$0	4				
5					\$0	5				
6					\$0	6				
7					\$0	7				
8	AB		Light Crack Treatment	\$1,5		8				
9					\$0	9				
10					\$0	10				
11					\$0	11				
	AC		Chip Seal	\$20,0		12				
13			Onip Seai		\$0		AE		1st CPR 20 yr.	¢3
14					\$0 \$0	14	<u> </u>		1st of it 20 yr.	\$3
					ΦO					
15					\$0 \$0	15				
16					\$0	16				
17					\$0	17				
18					\$0	18				
19					\$0	19				
	AD		2" Mill & 3.5" Overlay + 1.5" Shoulders	\$197,4		20				
21					\$0	21				
22					\$0	22				
23	AA		Crack Treatment	\$3,0	00	23				
24					\$0	24				
25					\$0	25	AF		2nd CPR 20 yr.	\$17
26					\$0	26				
	AC		Chip Seal	\$20,0		27				
28			•		\$0	28				<u> </u>
29					\$0	29				†
30					\$0	30				
31					\$0	31				
32					\$0 \$0	32				
33					\$0 \$0	33				
34		-			\$0 \$0	34				
35			NO DEMAINING SEDVICE LIFE		\$0 \$0	35			NO DEMAINING SERVICE LIFE	-
ახ			NO REMAINING SERVICE LIFE			35			NO REMAINING SERVICE LIFE	<u> </u>
			Total Present Worth	\$537,8		1			Total Present Worth	\$ 749
			Eq. Annual Cost*	\$23,2					Eq. Annual Cost*	\$3
			% of Low Cost	100)%	L			% of Low Cost	
			* Equivalent Annual Cost is included for information only.							
	_	1	**Remaining Service Life Value is reported as a negative value.						1	

Cost Analysis/ T.H. 13/S.P. 2401-39(T.H. 69 to I-90)

Givens:

5.73 miles

Length =
Width of Road =
1" Bituminous = 24 feet(Conc.) 113 lbs/SY 24 feet(Bit.) 11/13/12-TRM

Interest Rate = 2.5 % Inflation Rate = 0 %

ltem	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
PATCH		Ton	120.00	\$27,504.00	Initial Cost	0	\$205,915	1.000	\$205,915	\$8,897
TACK COAT		GAL	\$1.00	\$24,203.52	Rout & seal	3	\$2,000	0.929	\$1,857	\$80
4.5" SPWEB340B	Wear	TON	55.00	\$1,128,186.58	Chipseal	5	\$20,000	0.884	\$17,677	\$764
		Total Cost:		\$1,179,894	Mill & 3" Overlay	17	\$145,117	0.657	\$95,370	\$4,121
		Cost/Mile:		\$205,915	Rout & seal	19	\$2,000	0.626	\$1,251	\$54
					Chipseal	21	\$20,000	0.595	\$11,908	\$514
					Mill & 3" Overlay	33	\$145,117	0.443	\$64,244	\$2,776
					Remaining Life Value	35	(\$125,768)	0.421	-\$52,995	-\$2,290
					-	Total P	resent Worth:		\$345,227	\$14,916
						Equivalent	Annual Cost:		\$14,916	\$14,916
					+					
6" Unbonded Over	lay(15 Yea	r Fix)								
6" Unbonded Over Item	lay(15 Yea Course	r Fix) Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Item	• •	•	Price/Unit 58.54	Total Cost \$334,763.33	Strategy Initial Cost	Year	Cost/Mile \$332,069	P/F 1.000	Present Worth \$332,069	Annual Cost \$14,347
PASSRC	• •	Unit								
	• •	Unit Ton	58.54	\$334,763.33	Initial Cost	0	\$332,069	1.000	\$332,069	\$14,347
PASSRC Conc Std Width 6 Structural Concrete	• •	Unit Ton SY	58.54 5.00	\$334,763.33 \$403,392.00	Initial Cost Major CPR	0 15	\$332,069 \$150,000	1.000 0.690	\$332,069 \$103,570	\$14,347 \$4,475
PASSRC Conc Std Width 6 Structural Concrete Reinforcement Bars	Course	Unit Ton SY CY	58.54 5.00 65.77	\$334,763.33 \$403,392.00 \$884,369.73	Initial Cost Major CPR 3.5" Bit. Overlay	0 15 25	\$332,069 \$150,000 \$160,754	1.000 0.690 0.539	\$332,069 \$103,570 \$86,709	\$14,347 \$4,475 \$3,746
PASSRC Conc Std Width 6	Epoxy Epoxy	Unit Ton SY CY Ib	58.54 5.00 65.77 0.80	\$334,763.33 \$403,392.00 \$884,369.73 \$28,512.48	Initial Cost Major CPR 3.5" Bit. Overlay Rout & seal	0 15 25 27 35	\$332,069 \$150,000 \$160,754 \$2,000	1.000 0.690 0.539 0.513	\$332,069 \$103,570 \$86,709 \$1,027	\$14,347 \$4,475 \$3,746 \$44

^{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, unbonded-15 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.

LIFE CYCLE COST ANALYSIS TH 65(IOWA/MN SL to I-35)

Givens: Length = 8.98 miles Width of Road = 24 feet 24 feet trm-8/10/12 1" Bituminous = 113 lbs/SY

Interest Rate = 2.5 % ${}^{*}\textbf{Note:}$ Aggregate and shoulder quantities were not included in each option.

Inflation Rate =	0	%		00 0	ns are based on 35 yr. life		adea iii eacii (option.	
MILL 2"& 3.5" Bitum	inous Ov Course	erlay(1 Unit	5 years) Price/Unit	Total Cost	Strategy	Year	Cost/Mile	Present Worth	Annual Cost
2" MILL BITUMINOUS	004.00	SY	0.80	\$101,150.72	Initial Cost	0	\$171,218	\$171,218	\$7,398
PATCH		TON	100.00	\$35,920.00	Rout & seal	2	\$2,000	\$1.904	\$82
TACK COAT		GAL	1.00	\$25,287.68	Chipseal	4	\$20,000	\$18,119	\$783
1.5" SPWEB340B	Wear	TON	55.00	\$589,360.99	Mill & 3" Overlay	17	\$170,279	\$111,907	\$4,835
2" SPWEB340B	Wear	TON	55.00	\$785,814.66	Rout & seal	19	\$2,000	\$1,251	\$54
	T	otal Cos	it:	\$1,537,534	Chipseal	21	\$20,000	\$11,908	\$514
	C	Cost/Mile):	\$171,218	Mill & 3" Overlay	33	\$170,279	\$75,383	\$3,257
				* · · · , – · ·	Remaining Life Value	35	(\$147,575)	-\$62,184	-\$2,687
						Total Pr	esent Worth:		\$14,236
						Equivalent	Annual Cost]
6" Unbonded Concr	ete Overla	ay-Dov	veled(20 ye	ars)					
Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	Present Worth	Annual Cost
4" MILL BITUMINOUS		SY	1.60	\$202,301.44	Initial Cost	0	\$448,460	\$448,460	\$19,376
PASSRC		Ton	44.57	\$1,067,540.64	Minor CPR	20	\$150,000	\$91,541	\$3,955
Conc Std Width 6		SY	3.35	\$423,568.64	Remaining Life Value	35	\$0	\$0	\$0
Structural Concrete		CY	75.17	\$1,584,062.42		Total Pr	esent Worth:	\$540,001	\$ 23,331
Reinforcement Bars	Epoxy	lb	0.86	\$128,380.80		Equivalent	Annual Cost	\$23,331	\$23,331
Dowel Bars	Ероху	each	8.19	\$621,318.30		-			_
	Tota	al Cost:		\$4,027,172					
		st/Mile:		\$448,460					
MILL & 4.5" Bitumin	ous Over	lay(20	years)						
Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year		Present Worth	Annual Cost
2" MILL BITUMINOUS		SY	0.80	\$101,150.72	Initial Cost	0	\$216,379	\$216,379	\$9,349
PATCH		Ton	100.00	\$35,920.00	Rout & seal	3	\$2,000	\$1,857	\$80
TACK COAT		GAL	1.00	\$37,931.52	Chipseal	5	\$20,000	\$17,677	\$764
4.5" SPWEB340B	Wear	TON	55.00	\$1,768,082.98	Mill & 3" Overlay	22	\$170,279	\$98,909	\$4,273
		otal Cos		\$1,943,085	Rout & seal	24	\$2,000	\$1,106	\$48
	C	Cost/Mile) :	\$216,379	Chipseal	26	\$20,000	\$10,525	\$455
					Remaining Life Value	35	(\$40,066)	-\$16,883	-\$729
						Total Pr	esent Worth:	\$329,570	\$14,239
						Equivalent	Annual Cost	\$14,239	\$14,239
									_

Preventive Maintenance adds 1 year of life to thin overlays and 2 years to medium overlays and Reclaimed pavements
 Each successive overlay has 1 year less life than previous one on a section.
 Medium overlay-15 years ,Thin unbonded and thick overlays-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		Metro
Performed By	RS •	D. Nelson
Analysis Period		35
Discount Rate		2.5

Project Number	2722-81
Date	11/28/2012
Funding Category	2
Low Cost Option #	1
Chosen Option #	1



В	IT	•	PCC	•					BIT •		PCC •				PCC V		
			OPTION #1						OPTION #2						OPTION #3		
			DESCRIPTION						DESCRIPTION						DESCRIPTION		
			4.5" Mill and Overlay (1.5" shld.)					5.5" Mill, 7.0" pcc, 1.5" OL shlo	i					6.0" Mill and Overlay (1.5" shd	r)	
			DESIGN LIFE		TYPE				DESIGN LIFE	TYI	PE				DESIGN LIFE	TYP	E
			15		1				20		2				20		1
Year	#	Life	Description		Cost/Mile	Year	#	Life			Cost/Mile	Year	#	1 ife		0	ost/Mile
0	_		4.5" Mill and Overlay (1.5" shld.)	\$	242,495	0			5.5" Mill, 7.0" pcc, 1.5" OL shld		352,412	0	_		6.0" Mill and Overlay (1.5" shdr)		298,977
1			4.0 Will and Overlay (1.0 Sina.)	\$	-	1			0.0 Willi, 7.0 pco, 7.0 CE orlia	\$	-	1			e.o wiii and evenay (1.o enar)	\$	-
2				\$	-	2				\$	-	2				\$	-
3	aa		Crack Treatment	\$	3,000	3				\$	-		aa		Crack Treatment	\$	3,000
4				\$	-	4				\$	-	4				\$	-
5				\$	-	5				\$	-	5				\$	-
6				\$	-	6				\$	-	6				\$	-
7				\$	-	7				\$	-		ab		Surface Treatment	\$	20,000
8				\$	-	8				\$	-	8				\$	-
9		\vdash		\$	<u>-</u>	9				\$	-	9		-		\$	-
10 11				\$	<u> </u>	10 11				\$	-	10 11			 	\$	<u> </u>
11		\vdash		\$		11				\$	-	11				\$	
13				\$	-	13	bc		Reseal and partials (15')	\$	72,126	13				\$	
14				\$	-	14	DC		researand partials (15)	\$	72,120	14				\$	
	ba	+	3.5" Mill & Overlay (2" shdr)	\$	190,238	15				\$	_	15				\$	-
16				\$	-	16				\$	-	16				\$	-
17				\$	-	17				\$	-	17				\$	-
18	aa		Crack Treatment	\$	3,000	18				\$	-	18				\$	-
19				\$	-	19				\$	-	19				\$	-
20				\$	-	20				\$	-		ba		3.5" Mill & Overlay (2" shdr)	\$	190,238
21				\$	-	21				\$	-	21				\$	-
22	ab	Ш	Surface Treatment	\$	20,000	22				\$	-	22				\$	-
23				\$	-	23				\$	-		aa		Crack Treatment	\$	3,000
24		Н		\$	-	24				\$	-	24		_		\$	-
25 26		+		\$	<u> </u>	25 26	bd		Major CPR (2" shdr)	\$	278,767	25 26		-		\$	<u>-</u>
27		+		\$		27				\$	-	27				\$	
28	H	+		\$		28				\$	-		ab	-	Surface Treatment	\$	20,000
	bb	+	4.5" Mill and Overlay (1.5" shdr)	\$	242,495	29				\$	-	29	ub		Curiace Treatment	\$	-
30			, , , , , , , , , , , , , , , , , , , ,	\$	-	30				\$	-	30				\$	-
31				\$	-	31				\$	-	31				\$	-
32	aa		Crack Treatment	\$	3,000	32				\$	-	32				\$	-
33				\$	-	33				\$	-	33				\$	-
34				\$	-	34				\$	-		bb		4.5" Mill and Overlay (1.5" shdr)	\$	242,495
35			Remaining Service Life Value**	\$	(114,469)	35			Remaining Service Life Value**	\$	-	35			Remaining Service Life Value**	\$	(207,853)
	<u> </u>	\perp															
-	 	\vdash					<u> </u>						<u> </u>	₩			
1	┢	+					\vdash			-			-	1			
-	┢	+												1			
1	┢	\vdash				—	\vdash	_		\vdash		 	\vdash	\vdash		 	
 	H													1			
1	H	\vdash					T						T	t			
<u> </u>														<u> </u>			
<u> </u>	<u> </u>	\vdash					_						_	<u> </u>			
<u> </u>	<u> </u>			_			<u> </u>			Ļ			<u> </u>	<u> </u>		L_	
			Total Present Worth	\$	461,799				Total Present Worth	\$	555,098				Total Present Worth	\$	463,554
1			Eq. Annual Cost*		\$19,952				Eq. Annual Cost*	-	\$23,983	l			Eq. Annual Cost*		\$20,028
ii .			% of Low Cost		100%				% of Low Cost	l	120%				% of Low Cost		100%

^{*} Equivalent Annual Cost is included for information only.

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

District	Metro	Draft
Performed By	A. Azarshin	Draft
Analysis Period	35	Draft
Discount Rate	2.7	Draft

Project Number	27	74-21
Date	10/3	31/2011
Funding Category	RS	~
Low Cost Option #		1
Chosen Option #		1

	Option #1	brek					Option #2			
	Description	3.5"	Mill & Over	lay			Description	1.5" Bit. Mill &	6.5" L	Inbonded PC
	Design Life (Years)		15	_	UMINOUS -		Design Life (Years)	15	PCC	~
Year	Description	C	ost/Mile		PW/Mile	Year	Description	Cost/Mile		PW/Mile
0	3.5 Mill and Overlay	\$	231,300	\$	231,300		1.5" Bit. Mill & 6.5" Unbonded	\$ 396,000		396,000
1				\$	-	1			\$	-
2				\$	-	2			\$	-
	Crack Seal	\$	5,000	\$	4,616	3			\$	-
5				\$		5			\$	-
6				\$	-	6			\$	-
	Micro Surfacing	\$	35,000	\$	29,045	7			\$	-
8	Wilcio Surfacing	Ψ	33,000	\$	20,040	8			\$	-
9				\$	_	9			\$	_
10				\$	-	10			\$	-
11				\$	-	11			\$	-
12				\$	-	12	Minor CPR	\$ 29,283	3 \$	21,270
13				\$	-	13			\$	-
14				\$	-	14			\$	-
	3.5" Mill and Overlay (3.5" on	\$	231,300	\$	155,103	15			\$	-
16				\$	-	16			\$	-
17				\$		17			\$	
	Crack Seal	\$	5,000	\$	3,095	18			\$	-
19				\$	-	19	Main ODD A O. for Division	0 405 404	\$	444.544
20				\$			Major CPR & Surface Planing	\$ 195,100	_	114,511
21	Missa Cuefosina	6	25.000	\$	10 477	21			\$	-
23	Micro Surfacing	\$	35,000	\$	19,477	23			\$	-
24				\$	-	24			\$	
25				\$		25			\$	-
26				\$		26			\$	-
27				\$		27			\$	-
	3.5" Mill and Overlay (3.5" on	\$	231,300	\$	109,699	28			\$	-
29	olo ilimana ovolia) (olo oli	-	потросо	\$	-	29			\$	-
30				\$	-	30	Remove and Replace	\$ 426,600		191,826
	Crack Seal	\$	5,000	\$	2,189	31			\$	-
32				\$	-	32			\$	-
33				\$		33			\$	-
34				\$	-	34			\$	-
35	Remaining Life	\$	(76,329)	\$	(30,042)	35	Remaining Life	\$ (285,822		(112,494)
				\$	-				\$	-
				\$					\$	-
				\$	-				\$	-
				\$	-				\$	-
				\$	-	-			\$	
				\$	-	_			\$	-
_				\$					\$	
_				\$					\$	-
				\$					\$	-
				\$	-				\$	-
-				\$	-				\$	-
				\$	141				\$	-
				\$					\$	-
				\$	-				\$	-
	Tota	al Pre	sent Worth	_	524,483		Total	Present Worth	1 \$	611,113
ł	7.5%		f Low Cost		100%			% of Low Co:		117%

D. Nelson
35
2.7

Project Number	2785-367
Date	2/10/2012
Funding Category	RS 🔻
Low Cost Option #	1
Chosen Option #	1

			OPTION #1						OPTION #2						OPTION #3		
			DESCRIPTION						DESCRIPTION						DESCRIPTION		
			4" Mill and Overlay (2" shdr)	ı					4.0" mill, 7.0" pcc, 4" OL shld	П		_					
			DESIGN LIFE		TYPE				DESIGN LIFE	TYF					DESIGN LIFE	TYPE	
			15	BIT					15	PCC					20	PCC	
Year	_	Life			Cost/Mile	Year	#	Life		_	Cost/Mile	Year	#	Life	Description	Cost/N	/lile
0			4" Mill and Overlay (2" shdr)	\$	288,627	0			4.0" mill, 7.0" pcc, 4" OL shld	\$	575,068	0					
1		\vdash		\$	-	1				\$	-	1				\$	-
2			O	\$	-	2				\$	-	2		┝		\$	-
4	aa		Crack Treatment	\$	5,000	3 4				\$	-	3 4				\$	-
5		\vdash		\$		5				\$	-	5				\$	-
6		\vdash		\$		6				\$	-	6		H		\$	-
7	ab		Surface Treatment	\$	20,000	7				\$	-	7				\$	-
8			Canado Fredancia	\$	-	8				\$	-	8				\$	-
9				\$	-	9				\$	-	9				\$	-
10				\$	-	10				\$	-	10				\$	-
11				\$	-	11				\$	-	11				\$	-
12				\$	-	12	bc		Reseal and partials (12')	\$	29,283	12				\$	-
13				\$	-	13				\$	-	13				\$	-
14				\$	-	14				\$	-	14				\$	-
15	ba		3.5" Mill & Overlay (2" shdr)	\$	195,104	15				\$	-	15				\$	-
16				\$	-	16				\$	-	16				\$	-
17		\vdash	OI- TII	\$	-	17				\$	-	17				\$	-
18 19	aa	\vdash	Crack Treatment	\$	5,000	18 19				\$	-	18 19				\$	-
20		\vdash		\$	-	20	hd		Major CPR (2" shdr)	\$	177,553	20				\$	-
21				\$		21	bu		Major CFR (2 Shur)	\$	- 177,555	21				\$	-
22	ab		Surface Treatment	\$	20,000	22				\$	-	22				\$	-
23	ab		Surace Treatment	\$	-	23				\$	-	23				\$	-
24				\$	-	24				\$	-	24		H		\$	-
25				\$	-	25				\$	-	25				\$	-
26				\$	-	26				\$	-	26				\$	-
27				\$	-	27				\$	-	27				\$	-
28				\$	-	28				\$	-	28				\$	-
29	bb		4" Mill and Overlay (2" shdr)	\$	288,627	29				\$	-	29				\$	-
30				\$	-	30	bj		rem/replace 7.0" pcc	\$	661,449	30				\$	-
31				\$	-	31				\$	-	31				\$	-
32	aa		Crack Treatment	\$	5,000	32				\$	-	32		┝		\$	-
33		\vdash		\$	-	33				\$	-	33				\$	-
34 35		\vdash	Remaining Service Life Value**	\$	(104,868)	34 35			Remaining Service Life Value**	\$	(440,966)	34 35			Remaining Service Life Value**	\$	-
- 33			Remaining Service Life value	φ	(104,000)	33			Remaining Service Life Value	Ψ	(440,900)	33			Tremaining Service Life Value	Ψ	-
		\vdash								1				t			
						H				t				H			
										t							
	T	П				П				T				Т		1	
										T							
		Щ								匚				\Box			
L	_	Ш								<u> </u>							
<u> </u>	_	Щ				\sqcup				<u> </u>		_		L			
	<u> </u>			<u> </u>		Ш		<u> </u>		₩			<u> </u>	⊢			
 	\vdash	H		\vdash		Щ		\vdash		\vdash		_	\vdash	\vdash		 	
-	\vdash			-		$\vdash\vdash$		-		├-		-	\vdash	⊢			
-	<u> </u>	<u> </u>	Total Duagant Minute	Φ.	E40.040	\vdash			Total Dragger Month	Φ.	004 400	<u> </u>		<u> </u>	Total Dragger W		
			Total Present Worth Eq. Annual Cost*	\$	549,042 \$24,445				Total Present Worth Eq. Annual Cost*	\$	824,423 \$36,706				Total Present Worth Eq. Annual Cost*		
			Eq. Annual Cost	\vdash	\$24,445 100%				eq. Annual Cost	 	\$36,706 150%				eq. Annual Cost	-	
1			% OI LOW COST		100%				% OI LOW COST	1	150%				% OI LOW COST	l	

^{*} Equivalent Annual Cost is included for information only.

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

Cost Analysis/ S.P. 2804-33/TH 44 From CSAH 12(Caledonia) to Butterfield Rd.

Givens:

Length = 12.551 miles

24 feet(Conc.) 113 lbs/SY Width of Road = 24 feet(Bit.) 9/12/11-TRM 1" Bituminous =

2.7 % Interest Rate = Inflation Rate = 0 %

MILL & 3" min. Bitur	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
1.5" MILL BITUMINOUS		SY	0.50	\$88,359.04	Initial Cost	0	\$133,184	1.000	\$133,184	\$5,930
PATCH		Ton	100.00	\$50,204.00	Rout & seal	2	\$2,000	0.948	\$1,896	\$84
TACK COAT		GAL	\$1.00	\$35,343.62	Chipseal	4	\$20,000	0.899	\$17,978	\$800
3" SPWEB340B	Wear	TON	50.00	\$1,497,685.73	Mill & 3" Overlay	17	\$133,184	0.636	\$84,675	\$3,770
3 01 WEB340B	vvcai	Total Cost:	30.00	\$1,671,592	Rout & seal	19	\$2.000	0.603	\$1.206	\$5,770 \$54
		Cost/Mile:		\$1,671,592 \$133,184	Chipseal	21	\$2,000	0.572	\$1,200 \$11,430	\$509
		Cost/Mile.		\$133,104	Mill & 3" Overlav	33	\$133.184	0.372	\$55,288	\$2,462
					Rout & seal	35	\$2,000	0.394	\$787	\$35
					Remaining Life Value	35	(\$115,426)	0.394	-\$45,430	-\$2,023
					rtomaning Life value		resent Worth:	0.004	\$261,014	\$11,62
						Equivalent	Annual Cost:		\$11,621	\$11,62
6.5" Unbonded Over	lay(20 Y	ear Fix)								
Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
4" MILL BITUMINOUS		SY	1.50	\$265,077.12	Initial Cost	0	\$366,061	1.000	\$366,061	\$16,298
PASSRC		Ton	58.54	\$733,266.07	Minor CPR	20	\$150,000	0.587	\$88,040	\$3,920
Conc Std Width 6.5		SY	5.00	\$883.590.40	3.5" Bit. Overlay	32	\$153.072	0.426	\$65,259	\$2,906
Structural Concrete		CY	65.77	\$2,098,680.89	Rout & seal	34	\$2,000	0.404	\$808	\$36
Reinforcement Bars	Ероху	lb	0.80	\$62,453.78	Remaining Life Value	35	(\$126.059)	0.394	-\$49.615	-\$2,209
Dowel Bars	Ероху	each	5.20	\$551,360.41	3	Total P	resent Worth:		\$470,554	\$20,95
		Total Cost:		\$4,594,429		Equivalent	Annual Cost:		\$20,951	\$20,951
		Cost/Mile:		\$366,061		•				

MILL & 5" min. Bitur	ninous (Overlay(20	Year Fix)							
Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
1.5" MILL BITUMINOUS		SY	0.50	\$88,359.04	Initial Cost	0	\$212,736	1.000	\$212,736	\$9,472
PATCH		Ton	100.00	\$50,204.00	Rout & seal	2	\$2,000	0.948	\$1,896	\$84
TACK COAT		GAL	\$1.00	\$35,343.62	Chipseal	4	\$20,000	0.899	\$17,978	\$800
5" SPWEB340B	Wear	TON	50.00	\$2,496,142.88	Mill & 3" Overlay	22	\$133,184	0.556	\$74,114	\$3,300
		Total Cost:		\$2,670,050	Rout & seal	24	\$2,000	0.528	\$1,055	\$47
		Cost/Mile:		\$212,736	Chipseal	26	\$20,000	0.500	\$10,005	\$445
					Remaining Life Value	35	(\$31,337)	0.394	-\$12,334	-\$549
					1	Tatal D	resent Worth:		\$20E 4E4	#40.00
						i otai P	resent worth.		\$305,451	\$13,600

^{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, whitetopping-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.

Performed by			District		7	1	_	_	Project Number		3280-117	1					
Anabesis Formod 30 Currier Road 2.5 Currier Coption #																	
Discount Fates																	
										KD							
OPTION 81			Discount Rate		2.5						1						
DESCRIPTION DESCRIPTION DESCRIPTION STORT #F DESCRIPTION #F DESCRIPTION #F DESCRIPTION #F DESCRIPTION #F DESCRIPTION #F DESCRIPTION #F DESCRIPTION #F DESCRIPTION #F DESCR									Chosen Option #								
DESCRIPTION DESCRIPTION DESCRIPTION DESCRIPTION DESCRIPTION STORT #F DESCRIPTION #F DESCRIPTION #F DESCRIPTION #F DESCRIPTION #F DESCRIPTION #F DESCRIPTION #F DESCRIPTION #F DESCRIPTION #F DE																	
Second Content																	
Design Life																	
March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March March Marc										ı							
Year			DESIGN LIFE		TYPE				DESIGN LIFE	TYF	E				DESIGN LIFE	TYP	<u> </u>
O AM 163 Mill & 37 Overlay S 112,283 O AY 20 Unbonded Concrete Overlay S 688,912 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *CIR & 4" Overlay S 451, 12 O BA 203 *			14 year	BI	Г ▼				20 year	PCC	. ▼				20 years	BIT	•
1 S - 1 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S - 2 S	Year	#	Life Description		Cost/Mile	Year	#	Life	Description	(Cost/Mile	Year	#	Life	Description	С	ost/Mile
3 AA Crack Treatment \$ 3,000 3	0 /	AK	14 3" Mill & 3" Overlay		113,263	0	ΑY	20	Unbonded Concrete Overlay		668,912	0	ВА	20	3" CIR & 4" Overlay		451,135
S					-	1					-	1					-
S	2			_													-
S		AA	Crack Treatment		3,000												-
Compared S				_	-		_										-
7 AB																	-
S		ΔR	Chinseal														-
S		מה	Опрова		20,000	_									Light Crack Treatment		1,500
10					-										Light Orack Heatinefit		1,500
11																	-
12																	-
13					-	12						12	ΑB		Chipseal	\$	20,000
14 B																	
15					-			12	Repair (13 yr.)		93,496						-
16		BF	13 2" Mill & 3.5" Bit. Overlay		180,568						-						-
17 AA				_													-
18		Λ Λ	One of Transferred	_													-
19		AA	Crack Treatment														-
20																	-
21 AB														15	2.5" Mill & 3.5" Rit Overlay		200,049
S		AB	Chipseal	_									DL	13	2.5 Will & 5.5 Bit. Overlay		-
S			- Chipodai		-												-
24					-						-				Crack Treatment		3,000
26	24			\$	-	24				\$	-					\$	-
Total Present Worth S 31,006 S S S S S S S S S					-			10	Major CPR (25 yr.)		301,208						-
28	26			\$	-	26				\$	-	26				\$	-
28										_							
29		BF	12 2" Mill & 3.5" Bit. Overlay		180,568	27					-	27	AB		Chipseal		20,000
30 AA Crack Treatment \$ 3,000 30 \$ - 30 \$ \$ \$ \$ \$ \$ \$ \$ \$				_	-						-					-	-
S		ΛΛ	Crack Treatment			30											<u> </u>
32 \$ - 32 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 33 \$ - 34 \$ - 35 \$ - 34 \$ - 35 \$ - 35 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 36 \$ - 3		~~	Clack Healthent	_													
33 \$ - 33 \$ - 33 \$ - 34 \$ - 35 \$ - 34 \$ - 35 \$ - 34 \$ - 35 \$ - 34 \$ - 35 \$ - 34 \$ - 35 \$ - 34 \$ - 35 \$ - 34 \$ - 35 \$ - 34 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35 \$ - 35					-	32											-
AB					_						-						-
A Remaining Service Life (4/12) \$ (60,189.33) 35 No Remaining Service Life \$ 35 No Remaining Service Life \$ \$ \$ \$ \$ \$ \$ \$ \$		AB	Chipseal	\$	20,000						-						-
Eq. Annual Cost* \$15,206 Eq. Annual Cost* \$38,851 Eq. Annual Cost* \$25 % of Low Cost 100% % of Low Cost 255% % of Low Cost 1* * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only.<	35		4 Remaining Service Life (4/12)	\$	(60,189.33)	35			No Remaining Service Life	\$	-	35			No Remaining Service Life	\$	-
Eq. Annual Cost* \$15,206 Eq. Annual Cost* \$38,851 Eq. Annual Cost* \$25 % of Low Cost 100% % of Low Cost 255% % of Low Cost 1* * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only.<																	
Eq. Annual Cost* \$15,206 Eq. Annual Cost* \$38,851 Eq. Annual Cost* \$25 % of Low Cost 100% % of Low Cost 255% % of Low Cost 1* * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only.<																	
Eq. Annual Cost* \$15,206 Eq. Annual Cost* \$38,851 Eq. Annual Cost* \$25 % of Low Cost 100% % of Low Cost 255% % of Low Cost 1* * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only.<																	
Eq. Annual Cost* \$15,206 Eq. Annual Cost* \$38,851 Eq. Annual Cost* \$25 % of Low Cost 100% % of Low Cost 255% % of Low Cost 1* * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only.<				-			 	 		1-				_		<u> </u>	
Eq. Annual Cost* \$15,206 Eq. Annual Cost* \$38,851 Eq. Annual Cost* \$25 % of Low Cost 100% % of Low Cost 255% % of Low Cost 1* * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only.<				-			├	├		1							
Eq. Annual Cost* \$15,206 Eq. Annual Cost* \$38,851 Eq. Annual Cost* \$25 % of Low Cost 100% % of Low Cost 255% % of Low Cost 1* * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only.<				+			 	 		1				-			
Eq. Annual Cost* \$15,206 Eq. Annual Cost* \$38,851 Eq. Annual Cost* \$25 % of Low Cost 100% % of Low Cost 255% % of Low Cost 1* * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only.<				+			\vdash	\vdash		1							
Eq. Annual Cost* \$15,206 Eq. Annual Cost* \$38,851 Eq. Annual Cost* \$25 % of Low Cost 100% % of Low Cost 255% % of Low Cost 1* * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only.<				+			\vdash	\vdash		1							
Eq. Annual Cost* \$15,206 Eq. Annual Cost* \$38,851 Eq. Annual Cost* \$25 % of Low Cost 100% % of Low Cost 255% % of Low Cost 1* * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only.<				T													
Eq. Annual Cost* \$15,206 Eq. Annual Cost* \$38,851 Eq. Annual Cost* \$25 % of Low Cost 100% % of Low Cost 255% % of Low Cost 1* * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only.<				Ì													
Eq. Annual Cost* \$15,206 Eq. Annual Cost* \$38,851 Eq. Annual Cost* \$25 % of Low Cost 100% % of Low Cost 255% % of Low Cost 1* * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Eq. Annual Cost* \$25		1		1						L							
Eq. Annual Cost* \$15,206 Eq. Annual Cost* \$38,851 Eq. Annual Cost* \$25 % of Low Cost 100% % of Low Cost 255% % of Low Cost 1* * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only.<																	
Eq. Annual Cost* \$15,206 Eq. Annual Cost* \$38,851 Eq. Annual Cost* \$25 % of Low Cost 100% % of Low Cost 255% % of Low Cost 1* * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only.<																	
Eq. Annual Cost* \$15,206 Eq. Annual Cost* \$38,851 Eq. Annual Cost* \$25 % of Low Cost 100% % of Low Cost 255% % of Low Cost 1* * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only. * Equivalent Annual Cost is included for information only.<																	
% of Low Cost 100% % of Low Cost 255% % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low Cost 1 % of Low		[351,956					\$						\$	601,290
* Equivalent Annual Cost is included for information only.			Eq. Annual Cost	*	\$15,206					1							\$25,979
									% of Low Cost	<u> </u>	255%				/ % of Low Cost		171%
Remaining Service Life value is reported as a negative value.								luc									
			remaining Service Life Value	ıs re	orted as a ne	egativ	e va	ıue.		1					<u> </u>		

		_
District	3	Draft
Performed By	C. DeMenge	Draft
Analysis Period	35	Draft
Discount Rate	2.84	Draft
		l

Project Number	3309-14	
Date	1/12/2011	
Funding Category	Other -	
Low Cost Option #	1	
Chosen Option #	1	

	Option #1					Option #2						
	Description	3.0" Mill and 4.0	" Rit	Overlay		Description	5.5" Whitetoppir	na				
	Design Life (Years)			JMINOUS -		Design Life (Years)		PCC	-			
Year	Description	Cost/Mile	1	PW/Mile	Year	Description	Cost/Mile		PW/Mile			
	3.0" Mill and 4.0" Bit Overlay	\$ 191,000	\$	191,000		5.5" Whitetopping	\$ 380,000	\$	380,000			
1	,		\$	-	1			\$	-			
2			\$	-	2			\$	-			
3			\$	-	3			\$	-			
4	Soal Cost	ф <u>25.000</u>	\$	21,733	4 5			\$ \$	-			
6	Seal Coat	\$ 25,000	\$	21,733	6			\$	-			
7			\$	_	7			\$				
8			\$	-	8			\$	-			
9			\$	-	9			\$	-			
10			\$	-	10			\$	-			
11			\$	-	11			\$	-			
12 13			\$	-	12	Minor CPR	\$ 40,000	\$ \$	27,794			
14			\$	-	14	MINOI CPR	\$ 40,000	\$	- 27,794			
	2.0" Mill and 2.0" Overlay	\$ 119,000	\$	78,184	15			\$				
16	2.0 and 2.0 0.0	ψ 110,000	\$		16			\$	-			
17			\$	=	17			\$	=			
18			\$	-	18			\$	-			
19			\$	-	19			\$	-			
20 21	Seal Coat	\$ 25,000	\$	14,279	20 21			\$	-			
22			\$	-	22			\$ \$	-			
23			\$		23			\$	-			
24			\$	-	24			\$	-			
25			\$	-		Major CPR	\$ 150,000	\$	74,480			
26			\$	-	26			\$	-			
	3.0" Mill and 3.0" Overlay	\$ 174,000	\$	81,691	27			\$	-			
28 29			\$	-	28 29			\$ \$	-			
30			\$		30			\$	-			
31			\$	-	31			\$				
	Seal Coat	\$ 25,000	\$	10,204	32			\$	-			
33			\$	-	33			\$	-			
34			\$	=	34			\$	-			
35	Remaining Life	\$ (80,040)	\$	(30,035)	35	Remaining Life		\$	-			
			\$	-				\$	-			
			\$	-				\$	<u>-</u>			
			\$	-				\$				
			\$	-				\$	-			
			\$	-				\$	-			
			\$	-				\$	-			
			\$	-				\$	-			
			\$	-				\$	-			
			\$	-				\$ \$	-			
			\$					\$	<u> </u>			
			\$	-				\$	-			
			\$	-				\$	-			
			\$	-				\$	-			
	Tota	al Present Worth	\$	367,055		Tot	al Present Worth	\$	482,274			
		% of Low Cost		100%			% of Low Cost	1	131%			

Description Mill 4", Reclaim 6", Pave 5" 20 BITUMINOUS ▼		Option #3					
Year Description Cost/Mile PW/Mile 0 Mill 4*, Reclaim 6*, Pave 5** \$ 297,000 \$ 297,000 1 \$		Description	Mill 4"	, Reclaim	6", Pav	/e 5"	
Mill 4", Reclaim 6", Pave 5"							•
Mill 4", Reclaim 6", Pave 5"	.,						
1		Description Mill 4" Peoleim 6" Peop 5"					200
Seal Coat		IVIII 4 , Reciaim 6 , Pave 5	Φ	297,000		297,0	-
Seal Coat					\$		
5 Seal Coat \$ 25,000 \$ 21,733 6 \$ - 7 \$ - 8 \$ - 9 \$ - 10 \$ - 11 \$ - 12 \$ - 13 \$ - 14 \$ - 15 \$ - 16 \$ - 17 \$ - 18 \$ - 19 \$ - Mill 3.0" and Overlay 3.0" \$ 174,000 \$ 99,382 21 \$ - 22 \$ - \$ - 23 \$ - \$ - 24 \$ - \$ - 25 Seal Coat \$ 25,000 \$ 12,413 26 \$ - \$ - 27 \$ - \$ - 28 \$ - \$ - 30 \$ - \$ - 31 \$ - \$ - 29 \$ - \$ - 30 \$ - \$ -					\$		
S		0.10.1	•	05.000			
Total Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same Page Present Worth Same P		Seal Coat	\$	25,000	\$		
S					\$		
10	8				\$		-
11 \$ - 12 \$ - 13 \$ - 14 \$ - 15 \$ - 16 \$ - 17 \$ - 18 \$ - 19 \$ - 20 Mill 3.0" and Overlay 3.0" \$ 174,000 \$ 99,382 21 \$ - - - - 22 \$ \$ - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>							
12					\$		
13					\$		
14 \$ \$ - 15 \$ - - 17 \$ \$ - 18 \$ \$ - 19 \$ - - 20 Mill 3.0" and Overlay 3.0" \$ 174,000 \$ 99,382 21 \$ - - - 22 \$ \$ - - 23 \$ - - - - - 24 \$ \$ - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -					\$		
16 \$ - 17 \$ - 18 \$ - 19 \$ - 20 Mill 3.0" and Overlay 3.0" \$ 174,000 \$ 99,382 21 \$ - - 22 \$ \$ - 23 \$ - - 24 \$ \$ - 25 Seal Coat \$ 25,000 \$ 12,413 26 \$ \$ - 27 \$ \$ - 28 \$ \$ - 29 \$ \$ - 30 \$ \$ - 30 \$ \$ - 31 \$ \$ - 32 \$ \$ - 33 \$ \$ - 34 \$ \$ - 35 Remaining Life \$ - \$ \$ - \$ \$					\$		
17 18 \$ - 19 \$ - 20 Mill 3.0" and Overlay 3.0" \$ 174,000 \$ 99,382 21 \$ - 22 \$ - 23 \$ - 24 \$ - 25 Seal Coat \$ 25,000 \$ 12,413 26 \$ \$ - 27 \$ \$ - 28 \$ \$ - 29 \$ \$ - 30 \$ - - 31 \$ - - 32 \$ \$ - 33 \$ \$ - 33 \$ \$ - 34 \$ \$ - 35 Remaining Life \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ <td></td> <td></td> <td></td> <td></td> <td>\$</td> <td></td> <td></td>					\$		
18 \$ - 19 \$ - 20 Mill 3.0" and Overlay 3.0" \$ 174,000 \$ 99,382 21 \$ - - 22 \$ - - 23 \$ - - 24 \$ \$ - 25 Seal Coat \$ 25,000 \$ 12,413 26 \$ \$ - 27 \$ \$ - 28 \$ \$ - 29 \$ \$ - 30 \$ \$ - 31 \$ \$ - 32 \$ \$ - 33 \$ \$ - 34 \$ \$ - 35 Remaining Life \$ - \$ \$ - - \$ \$ - - \$ \$ - - \$ \$ - -					\$		
19					\$		
Mill 3.0" and Overlay 3.0" \$ 174,000 \$ 99,382					\$		
22 \$ \$ - 24 \$ - - 25 Seal Coat \$ 25,000 \$ 12,413 26 \$ - - 27 \$ - - 28 \$ - - 29 \$ - - 30 \$ - - 31 \$ - - 32 \$ - - 33 \$ - - 34 \$ - - 35 Remaining Life \$ - \$ - - - \$ - - - \$ - - - \$ - - - \$ - - - \$ - - - \$ - - - \$ - - - \$ - - - \$ -		Mill 3.0" and Overlay 3.0"	\$	174,000	\$	99,3	382
23		·			\$		
24 \$ 25,000 \$ 12,413 26 \$ - 27 \$ - 28 \$ - 29 \$ - 30 \$ - 31 \$ - 32 \$ - 33 \$ - 34 \$ - 35 Remaining Life \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -							
25 Seal Coat \$ 25,000 \$ 12,413 26 \$ - 27 \$ - 28 \$ - 29 \$ - 30 \$ - 31 \$ - 32 \$ - 33 \$ - 34 \$ - 35 Remaining Life \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -					\$		
26		Seal Coat	\$	25.000	\$		
27			,	-,	\$		
29					\$		
30					\$		
31					\$		
32					\$		
34	32				\$		-
Semaining Life					\$		
\$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -		Domaining Life					
\$ - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$	35	Remaining Life			\$		
\$ - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 5 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$ 7 - \$					\$		
\$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -					\$		_
\$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -							
\$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -					\$		
\$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -					\$		
\$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -							
\$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -					\$		
\$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -					\$		
\$ - \$ - \$ - Total Present Worth \$ 430,529							
\$ - \$ - Total Present Worth \$ 430,529							
\$ - Total Present Worth \$ 430,529					\$		
Total Present Worth \$ 430,529					\$		
% of Low Cost 117%		Tota	l Prese	ent Worth		430,5	529
			% of	Low Cost		11	7%

Mn/DOT DISTRICT 2 REHABILITATION WORKSHEET

(General Pre-Scoping / Planning Estimate)

TH 1 State Project 3602-25 - 2 different sections, 2 different fixes- 3rd section not included

	Funding category	RD			Alternate #1		Alternate #2	Alternate #3	Alternate #4
		Descript	on>		3.0" MILL & OL		5" whitetopping		
		-		T	1" mill 3" ol		& 6" new		
	Fi.	rot Coot & / Mile	YR	<u> </u>	\$404.0 7 0		P070 400		
		rst Cost \$ / Mile ehab Life in Yrs			\$134,270 35		\$372,192 35	35	35
		Interest %			2.70%		2.70%	2.84%	2.84%
					20 year		20 year		
			1		\$0		\$0	\$0	\$0
	otes:		2		\$0		\$0	\$0	\$0
	st Revised 11/25/08 (A, F, G, H st Revised 3/31/10 (B, C, D, E)		<u>3</u>		\$0 \$0		\$0 \$0	\$0 \$0	\$0 \$0
-a	2-Lane Highway		5		\$0		\$0	\$0	\$0
mp	provements	Cost / mile	6		\$0		\$0	\$0	\$0
4	Reclaim	\$287,589	7	F	\$7,000		\$0	\$0	\$0
3	1 1/2" Overlay	\$60,000	8		\$0		\$0	\$0	\$0
	1 1/2" Mill & 1 1/2" Overlay 2" Mill & Overlay	\$77,750 \$100,000	9 10		\$0 \$0		\$0 \$0	\$0 \$0	\$0 \$0
) =	3" Mill & Overlay	\$100,000 \$136,341	10		\$0		\$0 \$0	\$0	\$0
=	Route and Seal	\$7,000	12	G	\$23,000		\$0	\$0	\$0
3	Chip seal	\$23,000	13		\$0	Н	\$97,945	\$0	\$0
4	Joint seal & minor CPR	\$97,945	14		\$0		\$0	\$0	\$0
_	Minor CPR w/ full depth repair	\$201,000	15		\$0		\$0	\$0	\$0
J	Major CPR & griding	\$271,097	16 17		\$0 \$0		\$0 \$0	\$0 \$0	\$0 \$0
(Microsurface New Concrete	\$45,500 \$300,553	18		\$0		\$0	\$0	\$0
- Л	5.5" mill, conc rehab, 5" new	\$425,510	19		\$0		\$0	\$0	\$0
۷.	3" overlay	\$131,277	20	С	\$77,750		\$0	\$0	\$0
	•	, ,	21		\$0		\$0	\$0	\$0
			22		\$0		\$0	\$0	\$0
			23	F	\$7,000		\$0	\$0 \$0	\$0
			24 25		\$0 \$0		\$0 \$271,097	\$0 \$0	\$0 \$0
			26		\$0	3	\$0	\$0	\$0
				G	\$23,000		\$0	\$0	\$0
			28		\$0		\$0	\$0	\$0
			29		\$0		\$0	\$0	\$0
			30 31		\$0 \$0		\$0	\$0 \$0	\$0 \$0
			32		\$0		\$0 \$0	\$0	\$0
			33		\$0		\$0	\$0	\$0
			34		\$0		\$0	\$0	\$0
			35		\$0		\$0		
			36		\$0		\$0	\$0	\$(
			37 38		\$0 \$0		\$0 \$0	\$0 \$0	\$(\$(
			39		\$0		\$0	\$0	\$0
			40		\$0		\$0	\$0	\$0
			41		\$0		\$0	\$0	\$0
			42		\$0		\$0	\$0	\$0
			43		\$0		\$0	\$0 \$0	\$0
			44 45		\$0 \$0		\$0 \$0	\$0 \$0	\$0 \$0
			45		\$0		\$0	\$0	\$0
			47		\$0		\$0	\$0	\$0
			48		\$0		\$0	\$0	\$0
			49		\$0		\$0	\$0	\$0
		al Cost (Present			\$217,415		\$580,737	\$0	\$0
	Annu	al Cost (Present			\$9,680		\$25,857	\$1,000,000	\$1,000,000
		% Above Low	Option		100%		267%	10330%	103309

Data Furnished By:

Completed By: Date:

KO

11/21/2011

3" mill & 3 ol

1" mill 3" ol

5" whitetopping and a 6" new concrete

Mn/DOT DISTRICT 2 REHABILITATION WORKSHEET (General Pre-Scoping / Planning Estimate)

TH 11 State Project 3604-72

-			11	.1	11 State Pro	Jeci	3004-72				
	Funding category	RD			Alternate #1		Alternate #2		Alternate #3		Alternate #4
		Descript	ion>		1.5" MILL		5" whitetopping		New bit		Reclaim
		İ	YR	ľ	& 3"OVERLAY						
	Fir	rst Cost \$ / Mile			\$245,310		\$332,814		\$678,982		\$414,363
		ehab Life in Yrs			35		35		35		35
		Interest %			2.84%		2.84%		2.84%		2.84%
			1		\$0		\$0		\$0		\$0
	tes:		2		\$0		\$0		\$0		\$0
	it Revised 11/25/08 (A, F, G, H it Revised 3/31/10 (B, C, D, E)		3		\$0 \$0		\$0 \$0		\$0 \$0		\$0 \$0
Las	2-Lane Highway		5	G	\$23,000		\$0	G	\$23,000		\$0
lmp	rovements	Cost / mile	6		\$0		\$0		\$0	F	\$7,000
Α	Reclaim	\$287,589	7		\$0		\$0		\$0		\$0
В	1 1/2" Overlay	\$60,000	8		\$0		\$0		\$0		\$0
С	1 1/2" Mill & 1 1/2" Overlay	\$68,000	9		\$0		\$0		\$0		\$0
D	2" Mill & Overlay	\$100,000		F		Н	\$91,120	F	\$7,000	G	\$23,000
E F	3" Mill & 3" Overlay Route and Seal	\$141,200 \$7,000	11 12		\$0 \$0		\$0 \$0		\$0 \$0	 	\$0 \$0
F G	Chip seal	\$7,000 \$23,000	13		\$0		\$0 \$0		\$0 \$0		\$0
Н	Joint seal & minor CPR	\$91,120	14		\$0		\$0		\$0		\$0
l	Minor CPR w/ full depth repair	\$201,000	15		\$0		\$0		\$0		\$0
J	Major CPR & griding	\$284,750	16		\$0		\$0		\$0		\$0
K	Microsurface	\$45,500	17	Е	\$141,200		\$0		\$0		\$0
L	New Concrete	\$300,553	18		\$0		\$0		\$0		\$0
M	5.5" mill, conc rehab, 5" new	\$425,510	19		\$0		\$0 \$0	_	\$0	_	\$0
N	3" overlay	\$131,277	20 21	G	\$0 \$23,000		\$0 \$0	ט	\$100,000 \$0	C	\$68,000 \$0
			22	0	\$23,000	J	\$284,750		\$0 \$0		\$0
			23		\$0	•	\$0	F	\$7,000	F	\$7,000
			24		\$0		\$0		\$0		\$0
			25		\$0		\$0		\$0		\$0
			26		\$0		\$0		\$0		\$0
			27	F	\$7,000		\$0	G	\$23,000	G	\$23,000
			28 29		\$0 \$0		\$0 \$0		\$0 \$0		\$0 \$0
			30		\$0		\$0		\$0 \$0		\$0
			31		\$0		\$0		\$0		\$0
			32		\$0	N	\$131,277		\$0		\$0
			33	E	\$141,200		\$0	Е	\$141,200	E	\$141,200
			34		\$0		\$0		\$0		\$0
			35		(\$118,477)		(\$105,623)		(\$118,477)		(\$118,477)
			36 37		\$0 \$0		\$0 \$0		\$0 \$0		\$0 \$0
			38		\$0		\$0		\$0		\$0 \$0
			39		\$0		\$0		\$0		\$0
			40		\$0		\$0		\$0		\$0 \$0 \$0
			41		\$0		\$0		\$0		\$0
			42		\$0		\$0 \$0		\$0 \$0	-	\$0
			43 44		\$0 \$0		\$0 \$0		\$0 \$0		\$0 \$0
			44		\$0		\$0		\$0 \$0		02
			46		\$0		\$0		\$0 \$0		\$0 \$0
			47		\$0		\$0		\$0		\$0
			48		\$0		\$0		\$0		\$0
			49		\$0		\$0		\$0		\$0
		al Cost (Present			\$385,951		\$569,402		\$787,437		\$502,555
	Annu	al Cost (Present			\$17,545		\$25,884		\$35,796		\$22,845
		% Above Low	Option		100%		148%		204%]	130%

Data Furnished By: Completed By:

KO

Date: 6/7/2010

District	8
Performed By	S. Pedersen
Analysis Period	35
Discount Rate	2.84

Project Number	1212-30
Date	4/12/2011
Funding Category	2
Low Cost Option #	1
Chosen Option #	0

	OPTION #1				OPTION #2				OPTION #3		
	DESCRIPTION				DESCRIPTION				DESCRIPTION		
	BAB Reconstruction				Whitetopping				Whitetopping		
П			TVDE			TV) F			TYP	·-
	DESIGN LIFE		TYPE		DESIGN LIFE	TYI	'E		DESIGN LIFE	ITP	<u>'E</u>
	20		1		20		2		35		2
Year	Description		Cost/Mile	Year	Description	_		Year	Description	_	Cost/Mile
_	BAB Construction	\$	525,618		7" Whitetopping (20 yr)	\$	986,574	0	8" Whitetopping (35 yr)	\$	889,953
1		\$	-	1		\$	-	1		\$	-
2		\$	-	2		\$	-	2		\$	-
3		\$	-	3 4		\$	-	3		\$	<u> </u>
5		\$	-	5		\$	-	5		\$	
	Crack Treatment	\$	5,000	6		\$	-	6		\$	
-	Surface Treatment	\$	25,000	7		\$	-	7		\$	_
8	ounado moument	\$	-	8		\$	-	8		\$	-
9		\$	-	9		\$	-	9		\$	-
10		\$	-	10		\$	-	10		\$	-
11		\$	-	11		\$	-	11		\$	-
12		\$	-	12		\$	-	12		\$	-
13		\$	-		Minor CPR + Seal	\$	29,000	13		\$	-
14		\$	-	14		\$	-	14		\$	-
15		\$	-	15		\$	-	15		\$	-
16		\$	-	16		\$	-	16	Nr. 000	\$	- 04 500
17		\$	-	17		\$	-		Minor CPR	\$	21,500
18 19		\$	-	18 19		\$	-	18 19		\$	<u>-</u>
	2"Mill & 2" Overlay	\$	124,626	20		\$	-	20		\$	
21	Z Willi & Z Overlay	\$	-	21		\$	-	21		\$	-
22		\$	_	22		\$	-	22		\$	_
	Crack Treatment	\$	5,000	23		\$	-	23		\$	-
	Surface Treatment	\$	25,000	24		\$	-	24		\$	-
25		\$	-	25	Major CPR + Grind	\$	130,000	25		\$	-
26		\$	-	26		\$	-	26		\$	-
27		\$	-	27		\$	-		Minor CPR + Seal	\$	29,000
28		\$	-	28		\$	-	28		\$	-
29		\$	-	29		\$	-	29		\$	-
30		\$	-	30		\$	-	30		\$	-
31		\$	-	31		\$	-	31		\$	-
32 33		\$	-	32 33		\$	-	32 33		\$	-
34		\$	-	34		\$	-	34		\$	
-	End of Analysis	\$			End of Analysis	\$	-		Remaining Service Life Value**	\$	(11,020)
- 00	End of Analysis	Ψ		- 00	End of Atlanyolo	Ψ			Tromaining Convice Elle Value	Ψ	(11,020)
						i –				1	
										1	
igsqcut						<u> </u>		<u> </u>		1	
$\vdash \vdash$						<u> </u>		<u> </u>		1	
$\vdash \vdash \vdash$						<u> </u>		-		╂	
\vdash						 		-		+	
$\vdash \vdash \vdash$						 		-		╂	
\vdash								-		+	
$\vdash \vdash \vdash$										1	
\vdash						 				†	
	Total Present Worth	\$	636,968		Total Present Worth	\$	1,071,274	1	Total Present Worth	\$	912,789
Г	Eg. Annual Cost*	Ψ	\$28,956		Eq. Annual Cost*	Ψ	\$48,699		Eq. Annual Cost		\$41,494
	% of Low Cost		100%		% of Low Cost		168%		% of Low Cos		143%

^{*} Equivalent Annual Cost is included for information only.

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

APPENDIX 3

					Sco	ping Cost Ar	naly	sis T.H. 113			
						(SP 4405-26)					
						,					
	Givens:										
	Length =	11.823	miles			INPUTS					
	Width of Road =		feet			*Note: Aggregate ar	nd sho	ulder quantities were r	not included	in each option	
	1" Bituminous =		lbs/SY					ased on 35 yr. life cycl		iii odoii optioii.	
	Discount Rate =	2.84						sed off the 2009 Mn/Do		Prices and	
	Diocount Nate -	2.04	70					Contract Prices, as a		T HOOD GIIG	
hickness	2" Mill and 3" Overlay					Strategy	Year	Cost/Mile	P/F	Present Worth	
	Item	Course	Unit	Price/Unit	Total Cost	Initial Cost	0	\$100,398	1.000	\$100,398	\$4,564
	Mill Bituminous 2"		SY	0.75	\$124,850.88	rout & seal	3	\$2,000	0.919	\$1,839	\$84
1.5	SPWEB340B	Wear	TON	38.67	\$531,078.19	chip seal	6	\$20,000	0.845	\$16,907	\$769
1.5	SPWEB340B	Wear	TON	38.67	\$531,078.19	Bit. Reconstruct	15	\$296,000	0.657	\$194,474	\$8,841
			Total Cost:		\$1,187,007	rout & seal	18	\$2,000	0.604	\$1,208	\$55
			Cost/Mile:		\$100,398	chip seal	20	\$20,000	0.571	\$11,423	\$519
						RSL	35	\$0	0.375	\$0	\$0
						11		Total Pres	sent Worth:	\$326,249	\$14,831
		1				11		Equivalent A	nnual Cost:	\$14,831	
	E!! \Albitotomping										
	5" Whitetopping Item	Туре	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cod
	Mill Bituminous 2"	Type	SY	0.75	\$124,850.88	Initial Cost	0	\$222,699	1.000	\$222,699	\$10,124
	Concrete Pvmt. Std. Width	+	SY	4.50	\$749,105.28	Major CPR & plane		\$222,699	0.657		\$5,973
_		+					15			\$131,401	
5	Concrete Mat'l Cost	-	CY	76.08	\$1,759,010.18		23	\$296,000	0.525	\$155,440	\$7,066
		+	T-1-1 01		#0.000.000	RSL	35	(\$118,400)	0.375	(\$44,430)	-\$2,020
		+	Total Cost:		\$2,632,966				sent Worth:	\$465,110	\$21,143
		+	Cost/Mile:		\$222,699			Equivalent A	nnual Cost:	\$21,143	
	Bituminous Reconstruct	1	1								
	Item	Type	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cos
	Remove Bit. Pavement	17,50	SY	2.10	\$349,582.46	Initial Cost	0	\$295,434	1.000	\$295,434	\$13,430
2	SPWEB340C	Wear	TON	43.00	\$787,392.88	rout & seal	6	\$2,000	0.845	\$1,691	\$77
2.5	SPWEB340C	Wear	TON	43.00	\$984,241.10	chip seal	10	\$20,000	0.756	\$15,115	\$687
6	Agg Base Class 5	*******	CY	17.34	\$481,092.06	mill & 3" Overlay	20	\$106,000	0.730	\$60,543	\$2,752
20	Select Granular	1	CY	9.63	\$890,602.94	rout & seal	23	\$2,000	0.525	\$1,050	\$48
20	Coloct Chandia	+	<u> </u>	3.03	\$550,00 <u>2</u> .34	chip seal	27	\$20,000	0.469	\$9,390	\$427
		+	+	-		mill & 3" Overlay	35	\$106,000	0.409	\$39,777	\$1,808
		+	Total Cost:		\$3,492,911	RSL RSL	35	(\$106,000)	0.375	(\$39,777)	(\$1,808)
		+	Cost/Mile:		\$295,434	INOL	33		sent Worth:	\$383,222	\$17,421
		+	0004 MINE.	-	Ψ <u></u> 200, τοτ	H		Equivalent A		\$17,421	Ψ11,721
	6" Canarata Basanstruction	+				 		Equivalent A		Ψ11,421	
	6" Concrete Reconstruction	0.	11.75	D	T-1-1-0	01		0 (D.'-	D	
	Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	
	Remove Bit. Pavement	+	SY	2.10	\$349,582.46	Initial Cost	0	\$450,111	1.000	\$450,111	\$20,461
5	Agg Base Class 5		CY	17.34	\$400,910.05	Joint Reseal and Minor CPR	17	\$100,000	0.621	\$62,122	\$2,824
12	Select Granular		CY	9.63	\$534,361.77	Minor CPR	27	\$150,000	0.469	\$70,423	\$3,201
	Concrete Pvmt. Std. Width		SY	4.50	\$749,105.28	RSL	35	(\$58,000)	0.375	(\$21,765)	(\$989)
6	Structural Concrete		CY	76.08	\$2,110,812.21			otal Present Worth:		\$560,891	\$25,497
	Reinforcement Bars	Ероху	lb	0.97	\$67,415.31		Equ	valent Annual Cost:		\$25,497	
	Dowel Bars	Ероху	each	5.71	\$1,109,475.84						
			Total Cost:		\$5,321,663						
			Cost/Mile:		\$450,111						

District	2
Performed By	K.Olson
Analysis Period	35
Discount Rate	2.7

Project Number	4507	7-48				
Date	11/17/	11/17/2011				
Funding Category	RS	•				
Low Cost Option #	1					
Chosen Option #	ALT BI	D 18	3			

District	2
Performed By	K.Olson
Analysis Period	35
Discount Rate	2.7
Discount Nate	2.1

	OPTION #1					OPTION #2						OPTION #3			OPTION #4					
	DESCRIPTION					DESCRIPTION						DESCRIPTION						DESCRIPTION		
	5.0" mill 5" bit					6" unbonded						6.5" unbonded						5.0" mill 4. 5" bit		
	DESIGN LIFE	TYPI				DESIGN LIFE	_	YPE				DESIGN LIFE	TYPE					DESIGN LIFE	TYP	E
	20	BIT	•			20	F	CC v				35	PCC					15	BIT	▼
Year # Lit		Cost/N			# Lif	e Description	<u> </u>		Year	_	Life	Description		ost/Mile		r #	Life	Description	_	ost/Mile
0		\$ 278	8,154	1			\$	521,000	0				\$	545,119)	_		\$	228,555
2		\$	-	2			\$	-	2				\$	-	\vdash		1		\$	-
3		\$	-	3			\$		3				\$	-		B AA		Crack Treatment	\$	5,000
4		\$	-	4			\$	-	4				\$	-	- 4				\$	-
5		\$	-	5			\$		5				\$	-	Ę				\$	-
6		\$	-	6			\$		6				\$	-		3 45	<u> </u>	- · ·	\$	-
8 AA		\$ 5	5,000	7 8			\$		8	_			\$	-	- 4	AB	1	Surface Treatment	\$	23,000
9		\$	-	9			\$		9				\$	-			1		\$	-
10		\$	-	10			\$		10				\$	-	10				\$	-
11		\$	-	11			\$		11				\$	-	11				\$	-
12 AB	Surface Treatment		3,000	12			\$		12			-	\$	-	12			-	\$	-
13		\$	-	13	AP	Minor CPR (12')	\$		13				\$	-	13				\$	-
14 15		\$	-	14 15		 	\$		14 15				\$	-	14	AL		2" Mill & 3.5" Overlay	\$	161,200
16		\$	-	16			\$		16				\$		16		1	2 Willi & 3.5 Overlay	\$	161,200
17		\$	-	17			\$		17			Minor CPR (12')	\$	27,184	17		1		\$	-
18		\$	-	18			\$		18				\$	-		B AA		Crack Treatment	\$	5,000
19		\$	-	19			\$		19				\$	-	19				\$	-
			7,122	20			\$		20				\$	-	20		<u> </u>		\$	-
21		\$	-	21 22			\$		21 22	_			\$	-	21	AB	<u> </u>	Surface Treatment	\$	23,000
23 AA			5,000	23			\$		23	_			\$	-	23		1	Surface Treatment	\$	23,000
24	Clack Heathern	\$	-	24			\$	-	24				\$	-	24		1		\$	-
25		\$	-	25		Major CPR (12')	\$	277,870	25				\$	-	25				\$	-
26		\$	-	26			\$	-	26				\$	-	26				\$	-
27 AB	Surface Treatment		3,000	27			\$		27	BC		Minor CPR& full Depth(12')	\$	100,868	27		<u> </u>		\$	-
28		\$ \$	-	28 29			\$	-	28 29	_			\$	-	28	AH	1	2" Mill & 2" Overlay	\$	97,122
30		\$	-	30			\$	-	30				\$	-	30		1	2 IVIIII & 2 Overlay	\$	97,122
31		\$	-	31			\$		31				\$	-	3′		1		\$	-
32		\$	-	32			\$		32				\$	-	32			Crack Treatment	\$	5,000
33		\$	-	33			\$		33				\$	-	33				\$	-
34		\$	-	34			\$	-	34				\$	-	34				\$	-
35	Remaining Service Life Value**	\$	-	35		Remaining Service Life Value**	\$	-	35	##		Remaining Service Life Value**	\$	(38,330)	35	5 ##		Remaining Service Life Value**	\$	(52,446)
	+					 	+			-					\vdash	1	1			
					+		+			_			1		1	1				
	<u> </u>					<u> </u>	I									L	L			
							I					-						-		
							_				Щ				<u> </u>	4	_			
++	+				-	 	+		$\vdash \vdash$	-	Н		-		<u> </u>	+	₩		-	
 	1				-	 	+			-	H		1		1	+	1			
	+					†	+			-	H				\vdash	1	H			
	<u> </u>					<u> </u>	I									L	L			
	1						_			_					<u></u>	1	_			
	+					 	+		$\vdash \vdash$	_			-		<u> </u>	1	<u> </u>			
	Total Present Worth	¢ 260	9,817			Total Present Worth	ı \$	687,913			Щ	Total Present Worth	2	596,447	\vdash	1	_	Total Present Worth	\$	402,589
	Eq. Annual Cost*		16,466			Eg. Annual Cost		\$30,628	l		ŀ	Eq. Annual Cost*	Ψ	\$26,556	1			Eq. Annual Cost*	Ψ	\$17,925
	% of Low Cost		100%			% of Low Cos		186%			ľ	% of Low Cost	1	161%				% of Low Cost		109%
	* Equivalent Annual Cost is include	led for info	ormatio	n only	,	•												* Equivalent Annual Cost is include	ded fo	r informatio

3 dowels in each wheelpaths

15 YR DESIGN, No PASB, B oil

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

District	8
Performed By	K. Voss
Analysis Period	35
Discount Rate	2.7

Project Number	470	4705-42						
Date	2/10	2/10/2012						
Funding Category	RC	•						
Low Cost Option #	1							
Chosen Option #								

			OPTION #1						OPTION #2			OPTION #3						
			DESCRIPTION						DESCRIPTION			DESCRIPTION						
			3" mill & 3" overlay						3" mill & 4.5" overlay						6.5 " Whitetopping			
		1			TVDE					T	DE					TVD		
		ŀ	DESIGN LIFE	BIT	TYPE				DESIGN LIFE	TY BI		1			DESIGN LIFE	PCC		
V	#	Life	13 years			V	- 4	Life	15 years		Cost/Mile	Year	- ш	1 :4-	15 years		ost/Mile	
Year	Ħ	_	Description	_	247,000	Year	_	LIIE	Description Initial Construction		352,000	_	_	LIIE	Description Initial Construction	_	409,939	
0			Initial construction	\$	247,000	1			Initial Construction	\$	332,000	<u>0</u>			Initial Construction	\$	409,939	
2				\$	-	2				\$	-	2				\$	-	
	aa		Crack Treatment	\$	5,000		aa		Crack Treatment	\$	5,000	3				\$		
4				\$	-	4				\$	-	4				\$	-	
5	ab		Surface Treatment	\$	20,000	5				\$	-	5				\$	-	
6				\$	-	6				\$	-	6				\$	-	
7				\$	-		ab		Surface Treatment	\$	20,000	7				\$	-	
8				\$	-	8				\$	-	8				\$	-	
9				\$	-	9		!		\$	-	9				\$	-	
10				\$	-	10				\$	-	10				\$	-	
11 12				\$	-	11 12				\$	-	11	bk		1st CPR 12' Jt @ 15 yr	\$	32,943	
13	ba	12	3" Mill & OL w/o Shld	\$	136,456	13				\$	-	13			13. OF N 12 31 @ 13 91	\$	32,943	
14	by	12	3 Willi & OL W/O Office	\$	130,430	14				\$	-	14				\$		
15				\$	-	15	bi		2" Mill & 3.5" OL	\$	179,434	15				\$	-	
16	aa		Crack Treatment	\$	5,000	16				\$	-	16				\$	-	
17				\$	-	17				\$	-	17				\$	-	
18	ab		Surface Treatment	\$	20,000		aa		Crack Treatment	\$	5,000	18				\$	-	
19				\$	-	19				\$	-	19				\$	-	
20				\$	-	20				\$	-	20	bl		2nd CPR 12' Jt @ 15 yr	\$	251,151	
21				\$	-	21				\$		21				\$	-	
22				\$ 6	-	22	ab		Surface Treatment	\$	20,000	22				\$	-	
23 24				\$	-	23 24				\$	-	23 24				\$	<u> </u>	
	bu	11	3" Mill & OL Alt Bid Costs	\$	220,001	25				\$	-	25				\$		
26	bu	- ' '	3 Willi & OL Alt Bid Costs	\$	220,001	26				\$	-	26				\$		
27				\$	_	27				\$	_	27				\$		
28	aa		Crack Treatment	\$	5,000	28				\$	-	28				\$	-	
29				\$	-	29	bi		2" Mill & 3.5" OL	\$	179,434	29				\$	-	
30	ab		Surface Treatment	\$	20,000	30				\$	-	30	ax		Concrete Whitetopping	\$	492,307	
31				\$	-	31				\$	-	31				\$	-	
32				\$	-	32	aa		Crack Treatment	\$	5,000	32				\$	-	
33				\$\$	-	33				\$	-	33				\$	-	
34 35			Remaining Service Life Value**	\$	(20,000)	34 35			Remaining Service Life Value**	\$	(96,618)	34 35			Remaining Service Life Value**	\$	(328,205)	
33			Itemaning Service Life value	Ф	(20,000)	33			Remaining Service Life Value	φ	(90,010)	33			Remaining Service Life value	Ψ	(320,203)	
$\vdash \vdash$							<u> </u>	-		<u> </u>			<u> </u>	1		 		
\vdash		+					<u> </u>	-		<u> </u>		-		-		<u> </u>		
\vdash				_			_	<u> </u>		_		-		<u> </u>		-		
\vdash		\dashv		-			\vdash	\vdash		\vdash			\vdash	\vdash		 		
		_					\vdash	\vdash		\vdash			\vdash	\vdash		1		
							T			T			T					
			Total Present Worth	\$	497,794				Total Present Worth	\$	554,729				Total Present Worth	\$	673,474	
			Eq. Annual Cost*		\$22,164				Eq. Annual Cost*		\$24,699				Eq. Annual Cost*		\$29,986	
l			% of Low Cost		100%				% of Low Cost		111%				% of Low Cost		135%	

^{*} Equivalent Annual Cost is included for information only.

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

3 - Baxter
D. Nelson
35
2.7

Project Number	4812-83	ΤH	169
Date	4/11/2	2012	2
Funding Category	RS	•	
Low Cost Option #	1		
Chosen Option #	1		

			ORTION #4			1			OPTION #0						OPTION #0			
			OPTION #1						OPTION #2			OPTION #3						
	,	מיים יים	DESCRIPTION tuimous Mill and 3.5" Overlay (Ful	11 \ \ / /:	: -111-\			0.5"	DESCRIPTION Concrete Whitetopping ML, 3" Bi	+ CF1	l alua				DESCRIPTION 2.0" Mill and Fill, ML Only			
		2 61		I VVI				8.5										
			DESIGN LIFE		TYPE				DESIGN LIFE	TYI					DESIGN LIFE	TYPE		
			15 Years	BIT					15 Years	PC					9 Years	BIT	•	
Year		Life	Description	_	Cost/Mile	Year		Life		_	Cost/Mile	Year		Life		Cost/Mi		
	BB		2" Mill 3.5" OL, ML & Shldr	\$	234,480		AX		8.5" Concrete Whitetopping	\$	358,364		BA		2.0" Mill and Fill, ML Only		,686	
1				\$	-	1				\$	-	1				\$	-	
3				\$	-	3		-		\$	-	3				\$	-	
	AA		Crack Treatment	\$	5,000	4		\vdash		\$	-		AB		Surface Treatment		,000	
5	ΛΛ		Crack Treatment	\$		5				\$	-	5			Odnace Treatment	\$	-	
6		1		\$	-	6				\$	-	6				\$	-	
7				\$	-	7				\$	-	7				\$	-	
8				\$	-	8				\$	-	8				\$	-	
	ΑB		Surface Treatment	\$	25,000	9				\$	-		BB		2" Mill 3.5" OL, ML & Shldr	\$ 234	,480	
10				\$	-	10				\$	-	10				\$	-	
11				\$	-	11				\$	-	11				\$	-	
12				\$	-	12				\$	-	12			One of Tenneton and	\$	-	
13 14				\$	<u> </u>	13 14		 		\$	-	13	AA	-	Crack Treatment	\$ 5.	,000	
	вс		3.0" Mill & Fill - ML Only	\$	143,405		AR	\vdash	Major CPR (6'X6')	\$	150,000	15				\$	-	
16	В	H	3.0 Willia Till - WE Offing	\$	-	16		1	Major of K (0 X0)	\$	-	16				\$	_	
17				\$	-	17		1		\$	-	17			Surface Treatment		,000	
18				\$	-	18				\$	-	18				\$	-	
19	AΑ		Crack Treatment	\$	5,000	19				\$	-	19				\$	-	
20				\$	-	20				\$	-	20				\$	-	
21				\$	-	21		<u> </u>		\$	-	21				\$	-	
22				\$		22		-		\$	-	22			3.0" Mill & Fill - ML Only	\$ 143,	,405	
23	AB		Surface Treatment	\$	25,000	23 24		1		\$	-	23 24				\$	-	
25	AD		Sunace Treatment	\$	25,000		BF	+	Rem and Rep Conc Surf	\$	430,393		AA		Crack Treatment		,000	
26				\$	-	26		1	Remand Rep Conc Gun	\$	-30,333	26			Crack Treatment	\$	-	
27				\$	-	27		1		\$	-	27				\$	-	
28				\$	-	28				\$	-	28				\$	-	
	BD		1.5" ML Mill & Fill, 1.5" OL	\$	168,023	29				\$	-		AB		Surface Treatment		,000,	
30				\$	-	30				\$	-	30				\$	-	
31				\$	-	31				\$	-	31				\$	-	
32	ΛΛ		Crack Treatment	\$	5,000	32		-		\$	-	32				\$	-	
34	AA		Crack Treatment	\$	5,000	33 34		1		\$	-	33	BD		1.5" ML Mill & Fill, 1.5" OL	\$ \$ 168.		
35			Remaining Service Life Value**	\$	(90,474)	35		1	Remaining Service Life Value**	\$	(143,464)	35			Remaining Service Life Value**	\$ (152,74		
			rtemaning corvice and variat	Ψ	(00,111)	- 00			rtomaning convice Ene value	Ÿ	(1.10,10.1)	- 00			Tromaining Convice Life Value	Ψ (10 <u>2</u> ,1 1	00,	
							L	L		L								
		Ш					<u> </u>			_								
<u> </u>							<u> </u>	<u> </u>		<u> </u>			<u> </u>	_				
-		\vdash					Ͱ	1		┢			\vdash	-				
-		\vdash				1	┢	1		┢			\vdash	-				
						1	H	1		\vdash								
						1	t	<u>† </u>										
							L	L		L			L					
		Ш					L			<u> </u>								
 		Ш					<u> </u>	1		<u> </u>			<u> </u>					
-		<u> </u>	— , . =	4		<u> </u>	<u> </u>			_	005	<u> </u>	<u> </u>					
			Total Present Worth	\$	415,072	ł			Total Present Worth	\$	623,592				Total Present Worth			
			Eq. Annual Cost*		\$18,481	l			Eq. Annual Cost*	\vdash	\$27,765				Eq. Annual Cost*		9,047 103%	
11			% of Low Cost	i i	100%	ı			% of Low Cost	1	150%				% of Low Cost	1	103%	

^{*} Equivalent Annual Cost is included for information only.

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

Performed By SJP Analysis Period 35 Discount Rate 2.7	District	8
	Performed By	SJP
Discount Rate 2.7	Analysis Period	35
	Discount Rate	2.7

Project Number	510)5-21
Date	10/3	1/2011
Funding Category	RS	1
Low Cost Option #		1
Chosen Option #	AL ⁻	ΓBID

	OPTION #1								OPTION #2		OPTION #3						
			DESCRIPTION						DESCRIPTION		DESCRIPTION						
		4.5" I	Bituminous Mill & Overlay (no wie	den	ing)	4"	Unb	ond	ed Concrete Overlay +PASSRC	(no v	widening)	6" Unbonded Concrete Overlay + PASSRC (no widening)					
			DESIGN LIFE		TYPE				DESIGN LIFE	TYF					DESIGN LIFE	TYP	
		ŀ		ВΠ					15	PC		1			35	PCC	
Year	#	Lifo	15 Description		Cost/Mile	Year	#	Life			Cost/Mile	Year	#	I if			ost/Mile
	#						#	LIIE		_				LIIE			
0			4.5" Bit. M&OL	\$	257,852	0			4" UBOL	\$	789,956	0	<u> </u>		6" UBOL	\$	941,614
1				\$	-	1				\$	-	1		-		\$	-
2				\$		2				\$	-	2	_			\$	-
	aa		Crack Treatment	\$	7,000	3				\$	-	3				\$	-
4				\$	-	4				\$	-	4				\$	-
5				\$	-	5				\$	-	5				\$	-
6				\$	-	6				\$	-	6				\$	-
7	ab		Surface Treatment	\$	21,000	7				\$	-	7				\$	-
8				\$	-	8				\$	-	8				\$	-
9				\$	-	9				\$	-	9				\$	-
10				\$	-	10				\$	-	10				\$	-
11				\$	-	11				\$	-	11				\$	-
12				\$	-	12				\$	-	12				\$	-
13				\$	_	13				\$	_	13				\$	
14				\$		14				\$	-	14				\$	
15	he		2" Mill & 3.5" Overlay	\$	176,769	15	hi		1st CPR	\$	49,316	15				\$	
16	De		2 Willi & 3.5 Overlay	\$	170,709	16	υj		ISLOFIC	\$	49,310	16		-		\$	
17				\$		17				\$		17	_			\$	<u> </u>
_	_		Con al. Tanatan ant							_			_			_	
18	aa		Crack Treatment	\$	7,000	18				\$		18		-		\$	-
19				\$	-	19				\$	-	19		-		\$	-
20				\$	-	20				\$	-	20			4 × ODD	\$	-
21				\$		21				\$	-	21			1st CPR	\$	5,983
-	ab		Surface Treatment	\$	21,000	22				\$	-	22				\$	-
23				\$	-	23				\$	-	23				\$	-
24				\$	-	24				\$	-	24				\$	-
25				\$	-	25	bd		Remove & Replace (4" UBOL)	\$	761,356	25				\$	-
26				\$	-	26				\$	-	26				\$	-
27				\$	-	27				\$	-	27	bh		2nd CPR	\$	69,340
28				\$	-	28				\$	-	28				\$	-
29	be		2" Mill & 3.5" Overlay	\$	176,769	29				\$	-	29				\$	-
30				\$	-	30				\$	-	30				\$	-
31				\$	-	31				\$	-	31				\$	-
-	aa		Crack Treatment	\$	7,000	32				\$	-	32				\$	-
33				\$	-	33				\$		33				\$	-
34				\$	_	34				\$	_	34	_			\$	
35			End of Analysis Period	_	(95,183.06)	35			End of Analysis Perios		507,570.64)	35			End of Analysis Period	\$	(26,669)
- 55			2.13 S. / Halyolo I Ollou	Ψ	(55,155.50)	- 55			2.13 3.7 (naiyolo 1 01100	Ψ (20.,010.04)	- 55			Zina di Amaryolo i dilad	Ψ	(20,000)
\vdash		H						H		+-				H			
\vdash	-	H						H		+-				H			
\vdash	-	H					-	\vdash		-		1	\vdash	╁		 	
\vdash		Н				-	-	\vdash		-		1	1	1		 	
\vdash		\vdash				-	-	₩		+		 	₩	\vdash		-	
\vdash	_	$\vdash \downarrow$				-		<u> </u>		-		<u> </u>	<u> </u>	1		-	
\vdash	_	$\vdash \downarrow$				-		<u> </u>		-		<u> </u>	<u> </u>	1		-	
\vdash		Ш					_	<u> </u>				<u> </u>	_	_		<u> </u>	
Ш		Щ					L	L		1			1	_			
		Ш											_	_			
		Ш											_	_			
														L			
		آليا					L	L						L		L	
																	-
			Total Present Worth	\$	463,450				Total Present Worth	\$	1,014,390		_		Total Present Worth	\$	968,310
l		l	Eq. Annual Cost*		\$20,635				Eq. Annual Cost	*	\$45,164				Eq. Annual Cost*		\$43,113
l			% of Low Cost		100%				% of Low Cos	t	219%	1			% of Low Cost		209%

^{*} Equivalent Annual Cost is included for information only.

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

				District	7	1		Project Number	5204-112			
Discount Rate of 2.5% effective until 7/1/13				Performed By/ Review By:	A. Noble/ Vo	oat		Date	12/13/2011			
Discount Nate of 2.0% officerive artist 17 17 10				Analysis Period	35	yg.		Funding Category	RD ▼			+
Prices effective until July 1, 2013				Discount Rate	2.5			Low Cost Option #	1			
								Chosen Option #	1			
# Description	Cost/Mile			OPTION #1				OPTION #2			OPTION #3	
AA Crack Treatment	\$ 3,000			DESCRIPTION				DESCRIPTION			DESCRIPTION	
AB Chip Seal	\$ 20,000			3" Bituminous overlay with a Ultrathin Bonded Wearing Course			R	ubblize Inplace Concrete, Construct Bituminous			6"Unbonded Concrete Overlay	
AC 3" Bituminous Overlay (Mainline + Shld.)	\$ 244,276			DESIGN LIFE	TYPE	-		DESIGN LIFE	TYPE			TYPE
AD 2" Mill & 3.5" Overlay + 1.5" Shid. Overlay	\$ 286,559	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	"	15	011	- 1	N	20	BIT ▼		20	PCC
AE Light Crack Treatment	\$ 1,500	Year			Cost/Mile		Year # I		Cost/Mile	Year #		Cost/Mile
AF Mill 3.5" & Overlay 5" + Overlay shid. 1.5" AG Reseal Joints & Partial Depth Repair	\$ 308,593	0	15	5 Initial Construction	\$465,38		0	Initial Construction	\$722,824	0	Initial Construction	\$624,803
AH Major CPR	\$ 33,533 \$ 263,948	1				\$0 \$0	2		\$0 \$0	2		\$0 \$0
AI Major CFR	φ 203,940	3 /	ΔΔ	Crack Treatment	\$3,00	¥ -	3		\$0	3		\$0
AJ		4		Order Treatment		\$0	4		\$0	4		\$0
AK		5				\$0	5		\$0	5		\$0
AL		6				\$0	6		\$0	6		\$0
AM		7 /	AB	Chip Seal	\$20,00	00	7		\$0	7		\$0
AN		8				\$0	8 AE	Light Crack Treatment	\$1,500	8		\$0
AO		9				\$0	9		\$0	9		\$0
AP		10				\$0	10		\$0	10		\$0
AQ		11				\$0	11		\$0	11		\$0
AR		12				\$0	12 AB	Chip Seal	\$20,000	12	B Reseal Joints & Partial Depth Repair	\$0 \$22,522
AS AT		13 14				\$0 \$0	13 14		\$0 \$0	13 AG	Reseal Joints & Partial Depth Repair	\$33,533
AU			ΔD 1/	4 2" Mill & 3.5" Overlay + 1.5" Shld. Overlay	\$286,5		15		\$0	15		\$0 \$0
AV		16	AD 1-	+ 2 Will & 3.5 Overlay 1 1.5 Orlid. Overlay		\$0	16		\$0	16		\$0
AW		17				\$0	17		\$0	17		\$0
AX		18 /	AA	Crack Treatment	\$3,00	00	18		\$0	18		\$0
AY		19				\$0	19		\$0	19		\$0
AZ		20			(\$0	20 AF	Mill 3.5" & Overlay 5" + Overlay shld. 1.5"	\$308,593	20		\$0
BA		21				\$0	21		\$0	21		\$0
ВВ		22 /	AB	Chip Seal	\$20,00	_	22		\$0	22		\$0
BC		23				\$0	23 AA	Crack Treatment	\$3,000	23		\$0
BD		24				\$0	24		\$0	24	M.:ODD	\$0
BE BF		25 26				\$0 \$0	25 26		\$0 \$0	25 AH	Major CPR	\$263,948
BG BG		27				\$0 \$0	27 AB	Chip Seal	\$20,000	26 27		\$0 \$0
BH BH		28				\$0	28	Chip Seal	\$20,000	28		\$0
BI			AD 13	3 2" Mill & 3.5" Overlay + 1.5" Shld. Overlay	\$286,5	¥ -	29		\$0	29		\$0
BJ		30	10 10	2 mili a olo ovollaj i no olila. ovollaj		\$0	30		\$0	30		\$0
ВК		31				\$0	31		\$0	31		የ ባ
BL		32 A	AA	Crack Treatment	\$3,00		32		\$0	32		\$0
ВМ		33			Ç	\$0	33		\$0	33		\$0
BN		34			1	\$0	34		\$0	34		\$0
ВР		35		7 years remaining life	-\$154,300.8		35	No Remaining Service Life Value	\$0	35	No Remaining Service Life Value	\$0
BQ				Total Present Worth				Total Present Wo			Total Present Worth	
BR				Eq. Annual Cost*				Eq. Annual C			Eq. Annual Cost*	
BS				% of Low Cost	100	J%		% of Low C	Cost 122%		% of Low Cost	t 102%
BT				* Equivalent Annual Cost is included for information only.	-						<u> </u>	+
BU BV				**Remaining Service Life Value is reported as a negative value.	-							-
BW BW	+ +											+
BX												+
BY	+				1							+
BZ BZ	+ +											+
					1							

Cost Analysis S.P. 5501-35/TH 14(BYRON to ROCHESTER)

<u>GITGIIGI</u>									
Length =	16.12	miles							
Width of Road =	24	feet	24	feet	4/11/08-TRM				
1" Bituminous =	113	lbs/SY							
Interest Rate =	2.7	%		*Note: Aggregate	and shoulder quantiti	es were not inc	luded in each	option.	
Inflation Rate =	0	%		*Note: Calculation	ns are based on 35 yr.	. life cycle.			
4.5" Bituminous O	verlay(17 \	ear Fi	x)						
Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	Present Worth	Annual Cos
PATCH		TON	100.00	\$64,480.00	Initial Cost	0	\$202,729	\$202,729	\$9,026
TACK COAT		GAL	1	\$68,090.88	Rout & seal	2	\$2,000	\$1,896	\$84
1.5" SPWEB440E	Wear	TON	55.00	\$1,057,962.05	Mill & 3" Overlay	17	\$134,428	\$85,466	\$3,805
1.5" SPWEB440E	Wear	TON	55.00	\$1,057,962.05	Rout & seal	19	\$2,000	\$1,206	\$54
1.5" SPNWB430B	Wear	TON	53.00	\$1,019,490.70	Mill & 3" Overlay	32	\$134,428	\$57,311	\$2,552
	Te	otal Cos	st:	\$3,267,986	Rout & seal	34	\$2,000	\$808	\$36
	C	ost/Mil	e:	\$202,729	Salvage Value	35	(\$116,504)	-\$45,854	-\$2,042
						Total Pr	esent Worth:	\$303,561	\$13,51
						Equivalent	Annual Cost:	\$13,516	\$13,510
6" Unbonded Cond	crete Overl	ay(20	Year Fix)						
Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	Present Worth	Annual Cos
PASSRC		Ton	46.42	\$746,793.82	Initial Cost	0	\$332,814	\$332,814	\$14,81
Conc Std Width 6		SY	5.00	\$1,134,848.00	Major CPR	20	\$150,000	\$88,040	\$3,920
Structural Concrete		CY	65.77	\$2,487,965.10	Salvage Value	35	\$0	\$0	\$0
Reinforcement Bars	Epoxy	lb	0.80	\$80,213.12		Total Pr	esent Worth:	\$420,854	\$18,73
	' '								

Strategy

Chipseal

Chipseal

Initial Cost

Rout & seal

Rout & seal

Mill & 3" Overlay

Remaining Life Value

Equivalent Annual Cost:

Year

0

2

4

22

24

26

35

\$18,738

\$251,931

\$1,896

\$17,978

\$74,114

\$1,055

\$10,005

-\$12,334

\$344,646

\$15,345

Cost/Mile Present Worth

\$251,931

\$2,000

\$20,000

\$133,184

\$2,000 \$20,000

(\$31,337)

Total Present Worth:

Equivalent Annual Cost:

\$18,738

Annual Cost

\$11,217

\$84

\$800

\$3,300

\$47

\$445

-\$549

\$15,345

\$15,345

Ass	ump	tion	s-

Dowel Bars

PATCH

TACK COAT

1.5" SPWEB440E

1.5" SPWEB440E

2.5" SPNWB430B

Item

1.5" MILL BITUMINOUS

Givens:

1. Preventive Maintenance adds 1 year of life to thin overlays and 2 years to medium overlays and Reclaimed pavements

6.72

Price/Unit

\$0.50

\$100.00

\$1.00

55.00

55.00

53.00

each

Unit

SY

Ton

GAL

TON

TON

TON

Total Cost:

Cost/Mile:

Total Cost:

Cost/Mile:

Epoxy

Course

Wear

Wear

Wear

5.5" min. Bituminous Overlay(20 Year Fix)

\$915,141.43

\$5,364,961

\$332,814

Total Cost

\$113,484.80

\$64,480.00

\$68,090.88

\$1,057,962.05

\$1,057,962.05

\$1,699,151.17

\$4,061,131

\$251,931

2. Each successive overlay has 1 year less life than previous one on a section.

- 3. Heavy bit. overlay-17 years & 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.

APPENDIX 2

					Scop	ing Cost Analys	sis T	.H. 59		Revised 02/22/1	0
						(SP 5618-26)				5/12/2010	SKM
										9/21/2010	SKM
	Givens:						1				
	Length =		miles			INPUTS					
	Width of Road =		feet	27	WT	*Note: Shoulder quantiti					
	1" Bituminous =		lbs/SY			Calculations are					
	Discount Rate =	2.84	%			Unit Costs are b	ased fr	om 2009 Mn	/DOT bid tabs and 2009 Dis	trict 4 Contract C	osts.
Thislenson	2" Mill and 4" Ove	rlov				Strate m.	V	Cost/Mile	P/F	Due sout Month	Annual Cas
inickness	Item	Course	Unit	Price/Unit	Total Cost	Strategy Initial Cost	Year 0	\$137,448	1.000	Present Worth \$137,448	\$6,248
	Mill Bituminous 2"	Course	SY	0.75	\$152,495.20	rout & seal	3	\$2,000	0.919	\$1,839	\$84
2.00	SPWEB340B	Wear	TON	37.55	\$839,841.90	chip seal	6	\$20,000	0.845	\$16,907	\$769
2.00	SPWEB340B	Wear	TON	37.55	\$839,841.90	3" mill & overlay	15	\$111,000	0.657	\$72,928	\$3,315
	0250.02	1100.		01.00	φοσο,σ τ τισσ	rout & seal	24	\$2,000	0.511	\$1,021	\$46
						chip seal	26	\$20,000	0.483	\$9,656	\$439
						2" mill & overlay	29	\$75,000	0.444	\$33,294	1513.48291
						RSL	35	(\$30,000)	0.375	(\$11,258)	(\$512)
			Total Cost:		\$1,832,179			(, , ,	Total Present Worth:	\$261,835	\$11,903
			Cost/Mile:		\$137,448				Equivalent Annual Cost:	\$11,903	
	1.5" Mill and 3" Ov	/erlav				Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cos
	Item	Course	Unit	Price/Unit	Total Cost	Initial Cost	0	\$103,353	1.000	\$103,353	\$4,698
	Mill Bituminous 1.5"	224.00	SY	0.58	\$117,929.62	rout & seal	3	\$2,000	0.919	\$1,839	\$84
1.50	SPWEB340B	Wear	TON	37.55	\$629,881.42	chip seal	6	\$20,000	0.845	\$16,907	\$769
1.50	SPWEB340B	Wear	TON	37.55	\$629,881.42	3" mill & overlay	13	\$111,000	0.695	\$77,129	\$3,506
					***	rout & seal	22	\$2,000	0.540	\$1,080	\$49
						2" mill & overlay	25	\$75,000	0.497	\$37,240	\$1,693
						RSL	35	\$0	0.375	\$0	\$0
								* -	Total Present Worth:	\$237,547	\$10,799
			Total Cost:		\$1,377,692				Equivalent Annual Cost:	\$10,799	
			Cost/Mile:		\$103,353					·	
	5.5" Whitetopping	. 27' wi	ide								
	Item	Type	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cos
	Mill Bituminous 2"	7.	SY	0.75	\$158,360.40	Initial Cost	0	\$257,815	1.000	\$257,815	\$11,720
	Conc Pvmt Std Width		SY	4.50	\$914,971.20	Major CPR & plane	15	\$200,000	0.657	\$131,401	\$5,973
5.5	Structural Concrete		CY	76.08	\$2,363,336.72	Bituminous Reconstruct	23	\$ 338,000	0.525	\$177,496	\$8,069
						RSL	35	(\$176,000)	0.375	(\$66,045)	(\$3,002)
			Total Cost:		\$3,436,668				Total Present Worth:	\$500,667	\$22,760
			Cost/Mile:		\$257,815				Equivalent Annual Cost:	\$22,760	
	Bituminous Reco	nstruct	<u> </u>								
	Item	Туре	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cos
1.5	SPWEB340C	Wear	TON	44.97	\$754,348.01	Initial Cost	0	\$337,798	1.000	\$337,798	\$15,356
2	SPWEB340C	Wear	TON	44.97	\$1,005,797.34	rout & seal	3	\$2,000	0.919	\$1,839	\$84
2	SPWEB340B	Wear	TON	37.55	\$839,841.90	chip seal	5	\$20,000	0.869	\$17,387	\$790
12	Agg Base Class 5		CY	17.34	\$1,175,229.67	3" mill & overlay	25	\$111,000	0.497	\$55,115	\$2,505
13	Select Granular		CY	9.91	\$727,628.02	rout & seal	27	\$2,000	0.469	\$939	\$43
						chip seal	29	\$20,000	0.444	\$8,878	\$404
			Total Cost:		\$4,502,845	RSL	35	(\$55,500)	0.375	(\$20,827)	(\$947)
			Cost/Mile:		\$337,797.82				Total Present Worth:	\$401,129	\$18,235
									Equivalent Annual Cost:	\$18,235	
	3" Mill and 4.5" Ov	erlay				Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cos
	Item	Course	Unit	Price/Unit	Total Cost	Initial Cost	0	\$158,232	1.000	\$158,232	\$7,193
	Mill Bituminous 3"		SY	1.08	\$219,593.09	rout & seal	3	\$2,000	0.919	\$1,839	\$84
1.50	SPWEB340B	Wear	TON	37.55	\$629,881.42	chip seal	6	\$20,000	0.845	\$16,907	\$769
1.50	SPWEB340B	Wear	TON	37.55	\$629,881.42	3" mill & overlay	15	\$111,000	0.657	\$72,928	\$3,315
1.50	SPWEB340B	Wear	TON	37.55	\$629,881.42	rout & seal	22	\$2,000	0.540	\$1,080	\$49
						chip seal	25	\$20,000	0.497	\$9,931	\$451
						2" mill & overlay	29	\$75,000	0.444	\$33,294	\$1,513
						RSL	35	(\$30,000)	0.375	(\$11,258)	(\$512)
	I	1	Total Cost:		\$2,109,237				Total Present Worth:	\$282,952	\$12,863
			Cost/Mile:		\$158,232				Equivalent Annual Cost:	\$12,863	

District	2
Performed By	K.Olson
Analysis Period	35
Discount Rate	2.7

Project Number	6016	-37
Date	9/27/2	2011
Funding Category	RS	▼
Low Cost Option #	1	
Chosen Option #		

DESCRIPTION 3" mill 8" mill 5" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mill 6" mi				OPTION #1			OPTION #2									
S mill 3 7 mill TYPE 20 BIT DESIGN LIFE TYPE 20 BIT DESIGN LIFE TYPE 20 BIT DESIGN LIFE TYPE 20 RCC NCC							DESCRIPTION									
DESIGN LIFE TYPE 20 BIT ▼ DESIGN LIFE TYPE 20 RCC PCC											,					
Year						TVDE						=				
Vest # Life												_				
Company	Voor	#	Lifo				Voor	#	Lifo							
1	_	#	LIIE	Description				#	LIIE	Description						
Crack Treatment																
3												-				
S						-						-				
Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Cont	4	aa		Crack Treatment	\$	4,000	4				\$	-				
Total Present Worth \$ 279,456 Total Present Worth \$ 670,54 \$ 5						-						-				
S																
S																
10 ab Surface Treatment \$ 23,000 10																
11		ah		Surface Treatment												
12																
13	12					-		ΑP	5	Minor CPR (6'X6')		95,093				
15 AA					\$	-						-				
16						-						-				
17		AA		Crack Treatment		4,000						-				
18																
19																
20 Al 15 1.5" Mill & 3" Overlay \$ 153,500 20 \$ \$ - 21 \$ \$ - 21 \$ \$ - 22 \$ \$ - 22 \$ \$ - 22 \$ \$ - 22 \$ \$ - 22 \$ \$ - 22 \$ \$ - 23 \$ \$ - 23 \$ \$ - 23 \$ \$ - 23 \$ \$ - 23 \$ \$ - 23 \$ \$ - 23 \$ \$ - 23 \$ \$ - 23 \$ \$ - 23 \$ - 23 \$ - 24 \$ - 25 AR 10 Major CPR (6'X6') \$ 215,20 \$ - 26 \$ - 27 \$ - 27 \$ - 27 \$ - 27 \$ - 27 \$ - 28 \$ - 28 \$ - 28 \$ - 29 \$ - 29 \$ - 29 \$ - 29 \$ - 29 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 -																
21		ΑI	15	1.5" Mill & 3" Overlay												
S		<i>,</i>	10	The initial events								-				
Crack Treatment	22					-						-				
S						-					\$	-				
S		AA		Crack Treatment		4,000										
S								AR	10	Major CPR (6'X6')		215,202				
28																
S																
30 AB Surface Treatment \$ 23,000 30 \$ -						-										
S		AB		Surface Treatment		23.000										
S												-				
34	32					-					\$	-				
Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$ - 35 Remaining Service Life Value** \$	33				\$	-					-	-				
Total Present Worth \$ 279,456 Total Present Worth \$ 670,54																
	35			Remaining Service Life Value**	\$	-	35			Remaining Service Life Value**	\$	-				
												_				
				Total Present Worth	\$	279.456				Total Present Worth	\$	670,548				
				Eq. Annual Cost*	-	\$12,442				Eq. Annual Cost*	<u> </u>	\$29,855				
												240%				

^{*} Equivalent Annual Cost is included for information only.

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

APPENDIX 2

0 1 2 3 4 5		Life 3	District Performed By Analysis Period Discount Rate OPTION #1 DESCRIPTION 3" Mill and 4.5" Bituminous Over DESIGN LIFE 15 Description Initial Cost Crack Treatment Surface Treatment	BIT	4 SM 35 2.84 TYPE v 0st/Mile 165,000 - - 2,000	Year 0 1 2	#	Life	Project Number Date Funding Category Low Cost Option # Chosen Option # OPTION #2 DESCRIPTION 6" Whitetopping DESIGN LIFE 15 Description	TYPI PCC CG	ost/Mile
0 1 2 3 4 5 6 7 8 9 10 11 12	AA	Life 3	Analysis Period Discount Rate OPTION #1 DESCRIPTION 3" Mill and 4.5" Bituminous Overl DESIGN LIFE 15 Description Initial Cost Crack Treatment	BIT C \$ \$ \$ \$ \$ \$ \$	35 2.84 TYPE v ost/Mile 165,000 - - 2,000	0	#	Life	Date Funding Category Low Cost Option # Chosen Option # OPTION #2 DESCRIPTION 6" Whitetopping DESIGN LIFE 15	TYPI PCC Cd	1 1 1 E
0 1 2 3 4 5 6 7 8 9 10 11 12	AA	Life 3	OPTION #1 DESCRIPTION 3" Mill and 4.5" Bituminous Overl DESIGN LIFE 15 Description Initial Cost Crack Treatment	BIT C \$ \$ \$ \$ \$ \$ \$	2.84 TYPE ost/Mile 165,000 2,000	0	#	Life	Low Cost Option # Chosen Option # OPTION #2 DESCRIPTION 6" Whitetopping DESIGN LIFE 15	TYPI PCC Co	1 1 1 E
0 1 2 3 4 5 6 7 8 9 10 11 12	AA	Life 3	OPTION #1 DESCRIPTION 3" Mill and 4.5" Bituminous Overl DESIGN LIFE 15 Description Initial Cost Crack Treatment	BIT C \$ \$ \$ \$ \$ \$ \$	2.84 TYPE ost/Mile 165,000 2,000	0	#	Life	Low Cost Option # Chosen Option # OPTION #2 DESCRIPTION 6" Whitetopping DESIGN LIFE 15	PCC Co	1 E □ ▼
0 1 2 3 4 5 6 7 8 9 10 11 12	AA	Life 3	OPTION #1 DESCRIPTION 3" Mill and 4.5" Bituminous Over DESIGN LIFE 15 Description Initial Cost Crack Treatment	BIT C \$ \$ \$ \$ \$ \$ \$	TYPE ost/Mile 165,000 2,000	0	#	Life	OPTION #2 DESCRIPTION 6" Whitetopping DESIGN LIFE 15	PCC Co	1 E □ ▼
0 1 2 3 4 5 6 7 8 9 10 11 12	AA	Life 3	DESCRIPTION 3" Mill and 4.5" Bituminous Overl DESIGN LIFE 15 Description Initial Cost Crack Treatment	BIT C \$ \$ \$ \$ \$ \$ \$	ost/Mile 165,000 - - 2,000	0	#	Life	OPTION #2 DESCRIPTION 6" Whitetopping DESIGN LIFE 15	PCC Co	ost/Mile
0 1 2 3 4 5 6 7 8 9 10 11 12	AA	Life 3	DESCRIPTION 3" Mill and 4.5" Bituminous Overl DESIGN LIFE 15 Description Initial Cost Crack Treatment	BIT C \$ \$ \$ \$ \$ \$ \$	ost/Mile 165,000 - - 2,000	0	#	Life	DESCRIPTION 6" Whitetopping DESIGN LIFE 15	PCC Co	ost/Mile
0 1 2 3 4 5 6 7 8 9 10 11 12	AA	Life 3	DESCRIPTION 3" Mill and 4.5" Bituminous Overl DESIGN LIFE 15 Description Initial Cost Crack Treatment	BIT C \$ \$ \$ \$ \$ \$ \$	ost/Mile 165,000 - - 2,000	0	#	Life	DESCRIPTION 6" Whitetopping DESIGN LIFE 15	PCC Co	ost/Mile
0 1 2 3 4 5 6 7 8 9 10 11 12	AA	Life 3	3" Mill and 4.5" Bituminous Overl DESIGN LIFE 15 Description Initial Cost Crack Treatment	BIT C \$ \$ \$ \$ \$ \$ \$	ost/Mile 165,000 - - 2,000	0	#	Life	6" Whitetopping DESIGN LIFE 15	PCC Co	ost/Mile
0 1 2 3 4 5 6 7 8 9 10 11 12	AA	Life 3	DESIGN LIFE 15 Description Initial Cost Crack Treatment	BIT C \$ \$ \$ \$ \$ \$ \$	ost/Mile 165,000 - - 2,000	0	#	Life	DESIGN LIFE 15	PCC Co	ost/Mile
0 1 2 3 4 5 6 7 8 9 10 11 12	AA	3	Description Initial Cost Crack Treatment	BIT C \$ \$ \$ \$ \$ \$ \$ \$ \$	ost/Mile 165,000 - - 2,000	0	#	Life	15	PCC Co	ost/Mile
0 1 2 3 4 5 6 7 8 9 10 11 12	AA	3	Description Initial Cost Crack Treatment	\$ \$ \$ \$	ost/Mile 165,000 - - 2,000	0	#	Life		C(ost/Mile
0 1 2 3 4 5 6 7 8 9 10 11 12	AA	3	Initial Cost Crack Treatment	\$ \$ \$ \$	165,000 - - 2,000	0	#	Life	Description	\$	
1 2 3 A 4 5 6 A 7 8 9 10 11 12 13		3	Crack Treatment	\$ \$ \$	2,000	1					040.000
2 3 A 4 5 6 A 7 8 9 10 11 12 13				\$	2,000	-			Initial Cost		216,000
3 A 4 5 6 A 7 7 8 9 10 11				\$	2,000	2				\$	-
4 5 6 A 7 8 9 10 11 12 13				\$						\$	-
5 6 A 7 8 9 10 11 12 13	AB	9	Surface Treatment			3				\$	
6 A 7 8 9 10 11 12 13	AB	9	Surface Treatment	Ф		4				\$	-
7 8 9 10 11 12 13	Ab	9	Sunace freatment	\$	20,000	5 6				\$	
8 9 10 11 12 13				\$	20,000	7				\$	
9 10 11 12 13				\$		8				\$	
10 11 12 13				\$	-	9				\$	-
12 13				\$	-	10				\$	-
13				\$	-	11				\$	-
				\$	-	12				\$	-
14				\$	-	13				\$	-
				\$	-	14			A	\$	-
	АН	14	2" Mill & 2" Overlay	\$	71,000		AR	8	Major CPR (6'X6')	\$	200,000
16 17	_			\$	-	16 17				\$	-
18 /	ΛΛ	2	Crack Treatment	\$	2,000	18				\$	-
19	AA	3	Clack Heatilletit	\$	2,000	19				\$	
20				\$		20				\$	
	AB	8	Surface Treatment	\$	20,000	21				\$	
22		_		\$	-	22				\$	-
23				\$	-	23	ΑZ	20	New Bituminous Structure	\$	320,000
24				\$	-	24				\$	-
25				\$	-	25				\$	-
26				\$	-	26				\$	-
27				\$	-	27				\$	-
28	A 1.C	40	Oll Maill O. Oll Occarded	\$	400.000	28				\$	-
30	AK	13	3" Mill & 3" Overlay	\$	106,000	29 30				\$	-
31				\$	-	31				\$	
32 /	AΑ	3	Crack Treatment	\$	2,000	32				\$	
33	., \			\$	-	33				\$	
34				\$	-	34				\$	-
35			Remaining Service Life Value**	\$	(58,000)	35			Remaining Service Life Value**	\$	(128,000)
$\sqcup \bot$						<u> </u>					
	_										
						<u> </u>		<u> </u>			
	\dashv							<u> </u>			
	-							-			
	\dashv										
	\dashv										
	\exists										
	\neg										
			Total Present Worth	\$	268,815				Total Present Worth	\$	467,412
			Eq. Annual Cost*		\$12,220				Eq. Annual Cost*		\$21,248
			% of Low Cost		100%				% of Low Cost		174%
			* Equivalent Annual Cost is inclu								
			**Remaining Service Life Value i	s rep	orted as a i	negati	ve v	alue			

			District		4				Project Number	(6105-20
			Performed By		SM				Date		1/8/2011
			Analysis Period		35				Funding Category	RS	▼
			Discount Rate		2.7				Low Cost Option #		1
									Chosen Option #		1
			OPTION #1						OPTION #2		
			DESCRIPTION						DESCRIPTION		
			3" Mill and Inlay						5.5" Whitetopping		
			DESIGN LIFE		TYPE				DESIGN LIFE	TYP	
				DIT	ITPE					PCC	
\ <u></u>		1.16	15	BIT	1/5.431	\ /	.,	1	15		
Year	#	Life			ost/Mile	Year	#	Life			Cost/Mile
0 1			Initial Cost	\$	107,008	0 1			Initial Cost	\$	216,480
2				\$	-	2				\$	
	AA	3	Crack Treatment	\$	2,000	3				\$	
4	, , ,		orden frediment	\$	-	4				\$	-
5				\$	-	5				\$	-
	ΑB	9	Surface Treatment	\$	20,000	6				\$	-
7				\$	-	7				\$	-
8				\$	-	8				\$	-
9				\$	-	9				\$	-
10				\$	-	10				\$	-
11 12				\$	-	11 12				\$	-
13				\$	-	13				\$	
14				\$	-	14				\$	-
15	AK	14	3" Mill & 3" Overlay	\$	107,000	15	AR	8	Major CPR (6'X6')	\$	200,000
16			-	\$	-	16				\$	-
17				\$	-	17				\$	-
	AA	3	Crack Treatment	\$	2,000	18				\$	-
19				\$	-	19				\$	-
20	A.D.	- 0	Curfoo Troctment	\$	-	20				\$	-
21 22	AB	8	Surface Treatment	\$	20,000	21 22				\$	-
23				\$	-	-	ΑZ	20	New Bituminous Structure	\$	355,000
24				\$	_	24	/ _	20	New Bitalinious Ciructure	\$	-
25				\$	-	25				\$	-
26				\$	-	26	AΑ	3	Crack Treatment	\$	2,000
27				\$	-	27				\$	-
28				\$	-	28				\$	-
	AK	13	3" Mill & 3" Overlay	\$	107,000		AB	14	Surface Treatment	\$	20,000
30				\$	-	30				\$	-
31 32	ΔΔ	3	Crack Treatment	\$	2,000	31 32				\$	
33	/ (/1	3	Orack HoadHoll	\$	-	33				\$	
34				\$	-	34				\$	-
35			Remaining Service Life Value**	\$	(58,000)	35			Remaining Service Life Value**	\$	(142,000
								<u> </u>			
								\vdash			
								-			
								<u> </u>			
								_			
								<u> </u>			
			T. (15)	Φ.	007				T. 15	<u></u>	407.00
			Total Present Worth	\$	237,757	-			Total Present Worth	\$	497,299
			Eq. Annual Cost* % of Low Cost		\$10,586 100%				Eq. Annual Cost* % of Low Cost		\$22,142 209%
									/o OI LOW COST		2099
			* Equivalent Annual Cost is inclu	INDA :	for informat	ion on	lv/				

LIFE CYCLE COST ANALYSIS

District	Metro
Performed By	C. Kufner
Analysis Period	35
Discount Rate	2.7

Project Number	6222-	165
Date	12/1/2	2011
Funding Category	RS	~
Low Cost Option # Chosen Option #	1	
Chosen Option #	1	

	OPTION #1					OPTION #2								
	DESCRIPTION					DESCRIPTION						OPTION #3 DESCRIPTION		
	3.5" Bituminous Mill and Overla	٧				4" mill and 6" Bituminous Overla	ay					5" mill and 7" Concrete Overla	٧	
	DESIGN LIFE	TYPE				DESIGN LIFE	TYI)F				DESIGN LIFE	TYPI	
	12	BIT ▼				13	вг		1			15	PCC	
Year # Life		Cost/Mile	Year	#	Lifo			Cost/Mile	Year	#	Lifo			ost/Mile
0	3.5" Bit m/o, 1.5" shldr m/o	\$ 198,519	0		LIIE	4" mill and 6" Bit, 2" shldr	\$	292,963	0	#	LIIC	5" mill and 7" pcc (2" shldr)	\$	387,222
1	5.5 Bit 11/0, 1.5 311di 11/0	\$ -	1			4 min and 0 Bit, 2 Smar	\$	-	1			o mili and r pec (2 smar)	\$	-
2		\$ -	2				\$	-	2				\$	-
3		\$ -	3				\$	-	3				\$	-
4		\$ -	4				\$	-	4				\$	-
5		\$ -	5				\$	-	5				\$	-
7		\$ - \$ -	6 7				\$	-	6				\$	
8		\$ - \$ -	8				\$	-	7 8				\$	
9		\$ -	9				\$	-	9				\$	
10		\$ -	10				\$	-	10				\$	-
11		\$ -	11				\$	-	11				\$	-
12 bb	4" Mill and Overlay (2" shdr)	\$ 229,789	12				\$	-	12				\$	-
13		\$ -		bb		4" Mill and Overlay (2" shdr)	\$	229,789	13	aq		Minor CPR (15')	\$	63,985
14		\$ -	14				\$	-	14				\$	-
15 16		\$ - \$ -	15 16				\$	-	15 16				\$	-
17		\$ -	17				\$	-	17				\$	-
18		\$ -	18				\$	-	18				\$	-
19		\$ -	19				\$	-	19				\$	-
20		\$ -	20				\$	-	20	bj		Major CPR (15') (2" shldr)	\$	184,084
21		\$ -	21				\$	-	21				\$	-
22 bb	4" Mill and Overlay (2" shdr)	\$ 229,789	22				\$	-	22				\$	-
23		\$ -	23				\$	-	23				\$	-
24 25		\$ - \$ -	24 25			4" Mill and Overlay (2" shdr)	\$	229,789	24 25				\$	-
26		\$ -	26			4 Mili and Overlay (2 Shur)	\$	-	26				\$	
27		\$ -	27				\$	-	27				\$	-
28		\$ -	28				\$	-	28				\$	-
29		\$ -	29				\$	-	29				\$	-
30		\$ -	30				\$	-	30	af		4" Overlay	\$	292,818
31 bb	4" Mill and Overlay (2" shdr)	\$ 229,789	31				\$	-	31				\$	-
32		\$ - \$ -	32				\$	-	32				\$	-
33		\$ - \$ -	33 34				\$	-	33 34				\$	
35	Remaining Service Life Value**	\$ (114,895)	35			Remaining Service Life Value**	\$	-	35			Remaining Service Life Value**	\$	(246,839)
00	rtemaning convice and value	ψ (,σσσ ₎	- 00	П		rtemaning corride and value	Ψ		- 00			Tromaining Convict Line Value	<u> </u>	(2.0,000)
				Ш										
\square				Ш			_				_		<u> </u>	
\vdash			_	\vdash			\vdash				\vdash			
			—	\vdash							\vdash		 	
				\vdash			\vdash				H			
				Ш										
\square				Н			_				_		<u> </u>	
				\vdash							\vdash		-	
	Total Present Worth	¢ 549.600		Ш		Total Present Worth	¢	E72 E20			_	Total Present Worth	¢.	E7E 040
	Eq. Annual Cost*	\$ 548,693 \$24,430				Fig. Annual Cost*	Ф	573,536 \$25,536				Fig. Annual Cost*	\$	575,040 \$25,603
	% of Low Cost	100%				% of Low Cost	\vdash	105%				% of Low Cost	 	105%
	70 OI LOW 0031	10070				70 OI LOW 0031		10070				70 OI LOW 0031	1	100/0

^{*} Equivalent Annual Cost is included for information only.

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

LIFE CYCLE COST ANALYSIS

District	Metro
Performed By	C. Kufner
Analysis Period	35
Discount Rate	2.7

Project Number	6222-	165
Date	12/1/2	2011
Funding Category	RS	•
Low Cost Option #	1/1/1	900
Chosen Option #	1/1/1	900

			OPTION #4						OPTION #5						OPTION #6	
			DESCRIPTION						DESCRIPTION							
			6" mill, 4" reclaim + 6" Bituminou	ıs			6	" mi	II, 4" reclaim + 6" Concrete (tied s	shou	lder)				DESCRIPTION	
				TYF	DE				DESIGN LIFE	TYI			Π		DESIGN LIFE	TYPE
				BIT						PC					DESIGN LIFE	BIT V
V		li e.	20			V		1.76.	20			V	"	1.76-	Description	
Year	_	Life			Cost/Mile	Year		Life		_	Cost/Mile	Year	-	Life	Description	Cost/Mile
1	_		6" mill, 4" reclaim + 6" Bit	\$	475,765	0 1			6" mill, 4" reclaim + 6" pcc	\$	566,485	0 1				\$ -
2		+		\$	-	2				\$	-	2				\$ -
3		+		\$	-	3				\$	-	3				\$ -
4				\$	-	4				\$	-	4				\$ -
5				\$	-	5				\$	-	5				\$ -
6				\$	-	6				\$	-	6				\$ -
7				\$	-	7				\$	-	7				\$ -
	aa		Crack Treatment	\$	5,000	8				\$	-	8				\$ -
10				\$	-	9 10				\$	-	9 10				\$ - \$ -
10				\$	-	10				\$	-	10	Н			\$ -
	ab		Surface Treatment	\$	20,000	12				\$	-	12				\$ -
13			Sando Hodinoit	\$	-	13			Reseal and partials (12')	\$	29,283	13				\$ -
14				\$	-	14			()	\$	-	14				\$ -
15				\$	-	15				\$	-	15				\$ -
16				\$	-	16				\$	-	16				\$ -
17		_		\$	-	17				\$	-	17				\$ -
18		-		\$	-	18				\$	-	18				\$ -
19		-	2 5	\$	- 207 200	19				\$	-	19				\$ - \$ -
20	DI	+-	2.5" mill + 4" Bit (1.5" shdr)	\$	207,396	20 21				\$	-	20 21	Н			\$ -
22		+		\$	-	22				\$	-	22	Н			\$ -
-			Crack Treatment	\$	5,000	23				\$	-	23				\$ -
24				\$	-	24				\$	-	24				\$ -
25				\$	-		bd		Major CPR (12') (2" shdr)	\$	177,552	25				\$ -
26				\$	-	26				\$	-	26				\$ -
	ab		Surface Treatment	\$	20,000	27				\$	-	27				\$ -
28 29		+		\$	-	28 29				\$	-	28 29				\$ - \$ -
30		+-		\$	-	30				\$	-	30				\$ -
31		+		\$	-	31				\$	-	31	Н			\$ -
32				\$	-	32				\$	-	32				\$ -
33				\$	-	33				\$	-	33				\$ -
34				\$	-	34				\$	-	34				\$ -
35			Remaining Service Life Value**	\$	-	35			Remaining Service Life Value**	\$	-	35			Remaining Service Life Value**	\$ -
	┡	-					<u> </u>			┡			Н			
\vdash	⊢	1				<u> </u>	\vdash	\vdash		\vdash		-	Н			
\vdash	\vdash	1					\vdash	\vdash		\vdash		—	Н			
	H	+					Т			1			H			
		1								T			П			
										┖			Ш			
<u> </u>	⊢	1				<u> </u>	L	_		1			Ш			
—	⊢	-					⊢	\vdash		├-			Н			
\vdash	\vdash	1				<u> </u>	\vdash	\vdash		\vdash		_	Н			
	H	1								\vdash		<u> </u>	Н			
										t			Н			
			Total Present Worth	\$	628,512				Total Present Worth	\$	678,411				Total Present Worth	
			Eq. Annual Cost*		\$27,984				Eq. Annual Cost*		\$30,205				Eq. Annual Cost*	
			* Equivalent Appual Cost is inclu-		115%				% of Low Cost		124%				% of Low Cost	

^{*} Equivalent Annual Cost is included for information only.

Cost Analysis/ T.H. 19/S.P. 6602-29(Lonsdale to I-35)

Givens:

Length = 6.68 miles

Width of Road = 1" Bituminous = 24 feet(Conc.) 113 lbs/SY 24 feet(Bit.) 10/25/12-TRM

Interest Rate = 2.5 % Inflation Rate = 0 %

Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
PATCH		Ton	120.00	\$32,064.00	Initial Cost	0	\$160,754	1.000	\$160,754	\$6,945
TACK COAT		GAL	\$1.00	\$18,810.88	Rout & seal	2	\$2,000	0.952	\$1,904	\$82
3.5" SPWEB340B	Wear	TON	55.00	\$1,022,959.17	Chipseal	4	\$20,000	0.906	\$18,119	\$783
		Total Cost:		\$1,073,834	Mill & 3" Overlay	17	\$145,117	0.657	\$95,370	\$4,121
		Cost/Mile:		\$160,754	Rout & seal	19	\$2,000	0.626	\$1,251	\$54
					Chipseal	21	\$20,000	0.595	\$11,908	\$514
					Mill & 3" Overlay	33	\$145,117	0.443	\$64,244	\$2,776
					Remaining Life Value	35	(\$125,768)	0.421	-\$52,995	-\$2,290
						Total Pr	esent Worth:		\$300,554	\$12,986
						Equivalent .	Annual Cost:		\$12,986	\$12,986
6" Unbonded Over	lay(15 Yea	r Fix) Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
item	000.00		58.54	\$390,265.11	Initial Cost	0	\$332,069	1.000	\$332,069	\$14,347
PASSRC		Ton								
PASSRC		SY	5.00	\$470,272.00	Major CPR	15	\$150,000	0.690	\$103,570	\$4,475
PASSRC Conc Std Width 6 Structural Concrete					Major CPR 3.5" Bit. Overlay	15 25	\$150,000 \$160,754	0.690 0.539	\$103,570 \$86,709	\$4,475 \$3,746
PASSRC Conc Std Width 6	Ероху	SY	5.00	\$470,272.00						
PASSRC Conc Std Width 6 Structural Concrete Reinforcement Bars	Ероху Ероху	SY CY	5.00 65.77	\$470,272.00 \$1,030,992.98	3.5" Bit. Overlay	25	\$160,754	0.539	\$86,709	\$3,746
PASSRC Conc Std Width 6 Structural Concrete	Ероху	SY CY Ib	5.00 65.77 0.80	\$470,272.00 \$1,030,992.98 \$33,239.68	3.5" Bit. Overlay Rout & seal	25 27 35	\$160,754 \$2,000	0.539 0.513	\$86,709 \$1,027	\$3,746 \$44

^{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 or line to triin overlays and 2 years to me
2. Each successive overlay has 1 year less life than previous one on a section.
3. Medium overlay-15 years, unbonded-15 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 BITUMIN	IOUS & ONE PCC OPT	ION WITH EQUAL DESIGN L	IVES IS REQUIRED)					
District	7	Project Number		6703-23		District	7	Project Number	6703-23
Performed By	C. Bower	Date	4	4/27/2012	RD .	Performed By	C. Bower	Date	4/27/2012
Analysis Period	35	Funding Catego	ry	4		Analysis Period	35	Funding Category	3
Discount Rate	2.7	Low Cost Option	۱#	3		Discount Rate	2.7	Low Cost Option #	1/3/1900
		Chosen Option #	ý .					Chosen Option #	

Į.			1													
BIT 💌	OPTION #1	v		PCC • OPTION #2	PCC •		OPTION #3		PCC •	OPTION #4			OPTION #5		OPTION #6	
	DESCRIPTION			DESCRIPTION			DESCRIPTION			DESCRIPTION			DESCRIPTION		DESCRIPTION	
	4" Mill and Overlay			Bituminous Reclamation	n		35 Year Concrete Whitetoppin	ng		25 Year Whitetopping		R€	eclaim with Concrete Surfacing	and DSB	Reclaim with Concrete Surfacing	(no DSB)
	DESIGN LIFE	TYPE		DESIGN LIFE	TYPE		DESIGN LIFE	TYPE		DESIGN LIFE	TYPE		DESIGN LIFE	TYPE	DESIGN LIFE	TYPE
Į.	16	1		20	1		35	2		25	2		35	2	35	
Year # Life	Description	Cost/Mile	Year # L	ife Description	Cost/Mile	Year # L	ife Description	Cost/Mile	Year # Li	fe Description	Cost/Mile	Year # Life	Description	Cost/Mile Year	# Life Description	Cost/Mile
0		\$ 241,724	0	Initial Construction	\$ 482,965	0	Initial Construction	\$ 346,293	0	Initial Construction	\$ 332,159	0	Initial Cost	\$ 455,914 0		\$ 415,29
1		\$ -	1		\$ -	- 1		\$ -	1		\$ -	1		\$ - 1		\$ -
2		\$ -	2		\$ -	2		\$ -	2		\$ -	2		\$ - 2		\$ -
	Crack Treatment	\$ 5,000	3		\$ -	3		\$ -	3		\$ -	3		\$ - 3		\$ -
4		\$ -	4		\$ -	4		\$ -	4		\$ -	4		\$ - 4		\$ -
5		\$ -	5		\$ -	5		\$ -	5		\$ -	5		\$ - 5		\$ -
6		\$ -	6		\$ -	6		\$ -	6		\$ -	6		\$ - 6		\$ -
	Chip Seal	\$ 20,000	7		\$ -	7		\$ -	7		\$ -	7		\$ - 7		\$ -
8		\$ -	8 BC	Light Crack Treatment	\$ 2,500	8		\$ -	8		\$ -	8		\$ - 8		\$ -
9		\$ -	9		\$ -	9		\$ -	9		\$ -	9		\$ - 9		\$ -
10		\$ -	10		\$ -	10		\$ -	10		\$ -	10		\$ - 10		\$ -
11		\$ -	11		\$ -	11		\$ -	11		\$ -	11		\$ - 11		\$ -
12		\$ -	12 BB	Chip Seal	\$ 20,000			\$ -	12		\$ -	12		\$ - 12		\$ -
13		\$ -	13		\$ -	13		\$ -	13		\$ -	13		\$ - 13		\$ -
14		\$ -	14		\$ -	14		\$ -	14 BG	1st 25 Year CPR	\$ 27,184	14		\$ - 14		\$ -
15		\$ -	15		\$ -	15		\$ -	15		\$ -	15		\$ - 15		\$ -
		\$ 161,691			\$ -	16		\$ -	16		\$ -	16		\$ - 16		\$ -
17		\$ -	17		\$ -	17 BE	1st 35 Year CPR	\$ 27,184	17		\$ -		1st 35 Year CPR	\$ 27,184 17		\$ 27,18
18		\$ -	18		\$ -	18		\$ -	18		\$ -	18		\$ - 18		\$ -
	Crack Treatment	\$ 5,000		0.001000	\$ -	19		\$ -	19		\$ -	19		\$ - 19		\$ -
20		\$ -	20 BD	2.5" Mill and 4" Overlay	\$ 188,967			\$ -	20		\$ -	20		\$ - 20		
21 22		\$ - \$ -	21		\$ - \$ -	21		\$ - \$ -	21 22 BH	2nd 25 Year CPR	\$ - \$ 93.312	21		\$ - 21 \$ - 22		\$ - \$ -
	Chip Seal	\$ 20,000		Crack Treatment	\$ 5,000	22		\$ -	23	2nd 25 Year CPR	\$ 93,312	23		\$ - 22 \$ - 23		\$ -
24	Cnip Seai	\$ 20,000	23 AA	Crack Treatment	\$ 5,000	24		\$ -	24		\$ - \$ -	24		\$ - 23 \$ - 24		\$ -
25		s -	25		\$ -	25		S -	25		\$ -	25		\$ - 25		s -
26		\$ -	26		\$ -	26		S -	26		\$ -	26		\$ - 26		\$ -
27		\$.	27 BB	Chip Seal	\$ 20,000		2nd 35 Year CPR	\$ 93,312	27		\$.	27 BF	2nd 35 Year CPR	\$ 93,312 27		\$ 93,31
28		\$ -	28	Criip Gear	\$ -	28	Zild 35 Teal Cl IX	\$ -	28		\$ -	28	ZIIU 35 TEBI OT K	\$ - 28		\$ -
29		\$ -	29		\$ -	29		\$ -	29		\$ -	29		\$ - 29		\$ -
30		s -	30		\$ -	30		s -	30 BI	3rd 25 Year CPR	\$ 166,271	30		S - 30		s -
	2" Mill and 3.5" Overlay	\$ 161,691	31		\$ -	31		\$ -	31		\$ -	31		\$ - 31		\$ -
32		S -	32		s -	32		s -	32		\$ -	32		S - 32		s -
33		\$ -	33		\$ -	33		\$ -	33		\$ -	33		\$ - 33		\$ -
34 AA	Crack Treatment	\$ 5,000	34		\$ -	34		\$ -	34		\$ -	34		\$ - 34		\$ -
35	Remaining Service Life Value**	\$ (114,801)	35	Remaining Service Life Value	** \$ -	35	Remaining Service Life Value**	\$ (35,889.11)	35	Remaining Service Life Value**	\$ (96,991.25)	35	Remaining Service Life Value	** \$ (35,889.11) 35	Remaining Service Life Value	** \$ (35,889.1
$\perp \!\!\!\!\perp \!\!\!\!\perp \!\!\!\!\perp \!\!\!\!\perp$			lacksquare			$oxed{LL}$			\coprod							
$-\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$									$\sqcup \sqcup \sqcup$							
$-\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$									$\sqcup \sqcup \sqcup$							
-						lacksquare	-		\vdash				1			
-			\perp			$\vdash \vdash$	+		\vdash	1		-	1			
$-\!+\!-\!+\!-$		l	$\perp \perp$			+++	+		$\vdash \vdash \vdash$	+	1	-	 			
\rightarrow			$oldsymbol{\sqcup}$			+++			$\vdash \vdash$	1	1		1	\bot		
+			\vdash			\vdash	+		\vdash	+		-	1			-
-++			\vdash			+++		 	\vdash		├					
-++			+++			+++		 	\vdash		├					
+			\vdash	-	_	+++	+	1	++	+	1	-	1		++	
\rightarrow			\vdash			+++	+	1	\vdash	-	1	-++	—			
	Total Present Worth	\$ 409,995	+	Total Present Wo	rth \$ 622,875	+	Total Present Worth	\$ 394,901	\vdash	Total Present Worth	\$ 439.398		Total Present Wor	th \$ 504,521	Total Present Worl	th \$ 463,90
				I Utal FleSent WO	1111 DZZ,8/3	II .	rotal Fresent Worth		1							
			i	Ea Appual Co	net* \$27.722	2	Eq. Annual Coast	\$17 F00		Eq. Approal Cook			Eq. Appual Co.	c+* \$22.463	Eq. Annual Co.	
	Eq. Annual Cost*			Eq. Annual Co % of Low C			Eq. Annual Cost* % of Low Cost	\$17,582 1 100%		Eq. Annual Cost % of Low Cos			Eq. Annual Co % of Low Co		Eq. Annual Co	

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

District	7
Performed By	C. Bower
Analysis Period	35
Discount Rate	2.7

Project Number	6703	3-23
Date	12/6/	2012
Funding Category	RD	•
Low Cost Option #	1	
Chosen Option #		

			OPTION #1						OPTION #2		
			DESCRIPTION						DESCRIPTION		
			20 Year Concrete Whitetopping	ו							
			DESIGN LIFE		TYPE				DESIGN LIFE	TYPE	
			20	PCC					DEGIGN EILE	PCC	_
Year	#	Life	Description		cost/Mile	Year	#	Life	Description	Cost	/Mile
0	-11		Initial Construction	\$	239,499	0	"	LIIC	Description	0000	/ IVIIIC
1			Third Constitution	\$	-	1				\$	_
2				\$	-	2				\$	-
3				\$	_	3				\$	-
4				\$	-	4				\$	-
5				\$	-	5				\$	-
6				\$	-	6				\$	-
7				\$	-	7				\$	-
8				\$	-	8				\$	-
9				\$	-	9				\$	-
10				\$	-	10				\$	-
11				\$	-	11				\$	-
12				\$	-	12				\$	-
13	BA		Yr. 13 CPR	\$	70,236	13				\$	-
14				\$	-	14				\$	-
15				\$	-	15				\$	-
16				\$	-	16				\$	-
17				\$	-	17				\$	-
18				\$	-	18				\$	-
19				\$	-	19				\$	-
20				\$	-	20				\$	-
21				\$	-	21				\$	-
22				\$	-	22 23				\$	-
23 24				\$	-	23				\$	-
25	BB		Yr. 25 CPR	\$	146,502	25				\$	
26	טט		11. 23 CFR	\$	140,302	26				\$	
27				\$		27				\$	
28				\$	_	28				\$	
29				\$	_	29				\$	_
30				\$	-	30				\$	-
31				\$	-	31				\$	-
32				\$	-	32				\$	-
33				\$	-	33				\$	-
34				\$	-	34				\$	-
35			No Remaining Service Life	\$	-	35			Remaining Service Life Value**	\$	-
										1	
										1	
-										1	
										1	
										1	
										1	
										1	
			Total Present Worth	\$	364,438				Total Present Worth	1	
		}	Eq. Annual Cost*	Ψ	\$16,226				Eq. Annual Cost*	1	
		ŀ	% of Low Cost		100%				% of Low Cost		
			* Equivalent Annual Cost is include				_		, : 0. 20 0000		

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

Minnesota Department of Transportation District 7 2151 Bassett Drive Mankato, MN 56001-6888

Office Tel: 507-304-6100 Fax: 507-304-6119

Memo

TO:

James Swanson

District Engineer

FROM:

John Hager

District Materials Engineer

DATE:

May 1, 2012

SUBJECT:

LCCA Exception for SP 6703-23 (TH 23)

A life cycle cost analysis was performed in accordance with Tech Memo No. 10-04-MAT-01 for this project, which is proposed as an alternate bid with concrete and bituminous alternatives. A summary of the life cycle cost analysis is shown below:

Equivalent Annual Cost	Description (Selected Alternative)	Design Life (Years)	% Over Low Cost
\$395,000	6" Concrete Whitetopping	35	
\$410,000	4" Bituminous Mill and Overlay	16	104%
\$464,000	Reclaim with 6.5" Concrete Surfacing	35	117%
\$505,000	Reclaim with 6" Concrete Surfacing and DSB*	35	128%
\$623,000	Reclaim with 6" Bituminous Surfacing	20	158%

^{*}DSB – Drainable Stable Base – similar to the OGAB used in the past

The justification for not selecting the lowest cost alternatives is:

This section of TH 23 consists of a highly variable inplace pavement structure – with bituminous thickness between 8 and 12 inches, aggregate base between 0 and 8 inches, permeable asphalt stabilized base between 0 and 6 inches and granular between 0 and 36 inches. The bituminous pavement is also severely rutted to an unknown depth. In order to provide a more uniform base and repair the rutting, the district desires reclamation for both alternatives, which should reduce future maintenance costs. These benefits cannot be reflected in the current LCCA process. It should be noted that the "reclaim with concrete surfacing" options use 5-6" less select granular than current design standards call for.

I concur with the selected alternative,

James Swanson, District Engineer

Date

An Equal Opportunity Employer

















Life Cycle Cost Analysis - Rehabilitation (Cost/Mile) S.P. 7306-95 Interest Rate: 2.84

T.H. 23 0.00

Inflation Rate: Date 2/2/10 Discount Rate 2.84 Soils Engineer: Chad DeMenge Major Fixes are greater than \$25,000.00

		tion 1				otion 2 d 5.0" Overl				ion 3	-4-	
	3.5 Will and	d 3.5" Overla	У		5.0 IVIIII an	d 5.0 Oven	ay		5.0" Mill and	5.0 Concr	ete	
Year	Description of Work	Future Value	Present Value	Annualized	Description of Work	Future Value	Present Value	Annualized	Description of Work	Future Value	Present Value	Annualized
0	3.5" Mill and 3.5" Overlay	153683	153683	8669	5.0" Mill and 5.0" Overlay	216304	216304	12201	5.0" Mill and 5.0" Concrete	335276	335276	18913
2		0	0	0		0	0	0		0	0	0
3		0	0	0		0	0	0		0	0	0
4		0	0	0		0	0	0		0	0	0
5 6		0	0	0		0	0	0		0	0	0
7		0	0	0		0	0	0		0	0	0
8		0	0	0		0	0	0		0	0	0
9		0	0	0		0	0	0		0	0	0
11		0	0	0		0	0	0		0	0	0
12		0	0	0		0	0	0		0	0	0
13		0	0	0		0	0	0		0	0	0
14 15	3.5" Mill and 3.5" Overlay	0 153683	0 100971	0 5696		0	0	0		0	0	0
16	ord min and ord overlay	0	0	0		0	0	0		0	0	0
17		0	0	0		0	0	0		0	0	0
18 19		0	0	0		0	0	0		0	0	0
20		0	0	0	5.0" Mill and 5.0" Overlay	216304	123544	6969	Remove and Pave 5.0" Concrete	335276	191497	10802
21		0	0	0	•	0	0	0		0	0	0
22		0	0	0		0	0	0		0	0	0
23 24		0	0	0		0	0	0		0	0	0
25		0	0	0		0	0	0		0	0	0
26		0	0	0		0	0	0		0	0	0
27 28		0	0	0		0	0	0		0	0	0
29		0	0	0		0	0	0		0	0	0
30	3.5" Mill and 3.5" Overlay	153683	66338	3742		0	0	0		0	0	0
31 32		0	0	0		0	0	0		0	0	0
33		0	0	0		0	0	0		0	0	0
34		0	0	0		0	0	0		0	0	0
35		0	0	0		0	0	0		0	0	0
36 37		0	0	0		0	0	0		0	0	0
38		0	0	0		0	0	0		0	0	0
39		0	0	0	5 OHATH / 5 OH O	0	0	0		0	0	0
40 41		0	0	0	5.0" Mill and 5.0" Overlay	216304 0	70564 0	3980 0	Remove and Pave 5.0" Concrete	335276 0	109375 0	6170 0
42		0	0	0		0	0	0		0	0	0
43		0	0	0		0	0	0		0	0	0
44 45	3.5" Mill and 3.5" Overlay	0 153683	0 43585	0 2459		0	0	0		0	0	0
45	3.3 IVIIII AIIU 3.5 OVEIIAY	0	43585	0		0	0	0		0	0	0
47		0	0	0		0	0	0		0	0	0
48		0	0	0		0	0	0		0	0	0
49 50	Salvage Value	-102455	0 -25260	0 -1425	Salvage Value	-108152	0 -26664	0 -1504	Salvage Value	0 -167638	0 -41330	-2331
Totals		\$512.277	\$339,316			\$540.760	\$383,748			\$838.190	\$594,818	1
			Annualized	\$19,140.46				\$19,170.47		,	Annualized	\$33,553.00
		4	Annual Cost	100%		,	Annual Cost	100%		1	Annual Cost	175%

3.5" Mill and 3.5" Overlay is the low cost option

	3.5" Mill and 3.5" Overlay	5.0" Mill and 5.0" Overlay	5.0" Mill and 5.0" Concrete
Major Fixes	4	3	3
Maintenance Activities	0	0	0

Life Cycle Cost Analysis - Rehabilitation (Cost/Mile)

S.P. 7307-12 Interest Rate: 2.50 T.H. 28 Inflation Rate: 0.00 Soils Engineer: Darren Nelson Major Fixes are greater than \$25,000.00

	Option	า 1			Opti	on 2			Ор	tion 3			(Option4		
	3" Mill & 3" OL-Sh	oulders and	d ML		1.5" Mill & 1.5" OL-	Shlds and	Mainline		5" Concre	ete Mainline						
Year	Description of Work	Future Value	Present Value	Annualized	Description of Work	Future Value	Present Value	Annualized	Description of Work	Future Value	Present Value	Annualized	Description of Work	Future Value	Present Value	Annua
0	3" Mill & 3" OL-Shoulders and ML	\$111,701	111701	6063	1.5" Mill & 1.5" OL-Shlds and	60204	60204	3268	5" Concrete Mainline	238168	238168	12927		0	0	0
1		0	0	0		0	0	0		0	0	0		0	0	0
3		0	0	0		0	0	0		0	0	0		0	0	(
4	Surface Treatment	25000	22649	1229	Surface Treatment	25000	22649	1229		0	0	0		0	0	-
5		0	0	0		0	0	0		0	0	0		0	0	
7		0	0	0		0	0	0		0	0	0		0	0	
8		0	0	0		0	0	0		0	0	0		0	0	
9		0	0	0	2.0" Mill & 3.0" OL - Shldr and ML	112687	90232	4897		0	0	0		0	0	
10 11		0	0	0		0	0	0		0	0	0		0	0	
12		0	0	0		0	0	0		0	0	0		0	0	
13		0	0	0	Surface Treatment	25000	18136	984		0	0	0		0	0	
14 15	2.0" Mill & 3.0" OL - Shldr and ML	0 112687	77806	0 4223		0	0	0	Major CPR	0 150000	0 103570	0 5621		0	0	
16	2.0 Will & 3.0 OE - Stild and WE	0	0	0		0	0	0	Wajor Or IX	0	0	0		0	0	
17		0	0	0		0	0	0		0	0	0		0	0	
18	Surface Treatment	0	0 15638	0 849		0	0	0		0	0	0		0	0	
19 20	Surface Treatment	25000 0	0	0		0	0	0		0	0	0		0	0	
21		0	0	0		0	0	0		0	0	0		0	0	
22		0	0	0	3.0" Mill & 3.0" OL-Shoulders and ML	111701	64883	3522		0	0	0		0	0	
23 24		0	0	0		0	0	0		0	0	0		0	0	(
25		0	0	0		0	0	0	Concrete Milling and Paving	308477	166390	9031		0	0	
26		0	0	0		0	0	0		0	0	0		0	0	-
27 28	1.5" Mill & 1.5" OL-Shlds and Mainline	0 60204	0 30155	0 1637	Surface Treatment	25000 0	12835 0	697 0		0	0	0		0	0	
29	1.5 Will & 1.5 OE-Strius and Wallinine	0	0	0		0	0	0		0	0	0		0	0	
30	Salvage Value	-48163	-22961	-1246	Salvage Value	-47872	-22823	-1239	Salvage Value	-205651	-98043	-5321	Salvage Value	0	0	
																
																\equiv
																<u> </u>
																<u> </u>
			1				-									
																
																
			 													
																$\overline{}$
																_
otals		\$286,429	£224 000	1	 	©211 720	\$246,116			£400 004	\$410,085	 		\$0	60	

3" Mill & 3" OL-Shoulders and ML is the low cost option

	fill & 3" OL-Shoulders and	ill & 1.5" OL-Shlds and M	5" Concrete Mainline	
Major Fixes	3	3	2	
Maintenance Activities	2	3	0	

3
CD
35
2.84

Project Number	732	26-14
Date	4/28	/2011
Funding Category	RS	•
Low Cost Option #		1
Chosen Option #		1

District	3
Performed By	CD
Analysis Period	35
Discount Rate	2.84

	OPTION #1			OPTION #2					OPTION #3						OPTION #4		
	DESCRIPTION			DESCRIPTION					DESCRIPTION						DESCRIPTION		
	1.5" Mill and 3.0" Overlay			5.0" Whitetopping				Rec	laim 12", Remove 4.5", 6.0" Bitur	mina	ous			Re	claim 12", Remove 5.5", 7.0" Cor	ocrete	
	DESIGN LIFE	TYPE			TV	PE				TY						TYPE	
		BIT ▼			PC					BI						PCC	
Year # Life	e Description	DI 1	Year # Life	= 15 Description			Year #	ll ifo	20 Description		Cost/Mile	Vac	r #	l ifo	20 Description		ost/Mile
0	1.5" Mill and 3.0" Overlay	\$ 135,600	0	5.0" Whitetopping	\$	292,683	0		Reclaim/Remove/6" Bituminous		290,000) #		Reclaim/Remove/7" Concrete	\$	456,000
1	1.5 Will and 3.0 Overlay	\$ 135,600	1	5.0 Whitetopping	\$	292,003	1		Reclaim/Remove/o Bituminous	\$	290,000		1		Reciaili/Remove// Concrete	\$	430,000
2		\$ -	2		\$	-	2			\$	_	-	2			\$	-
3		\$ -	3		\$	-	3			\$	-	3	3			\$	-
4		\$ -	4		\$	-	4			\$	-		1			\$	-
5	Seal Coat	\$ 25,000	5		\$	-	5		Seal Coat	\$	25,000		5			\$	-
6		\$ - \$ -	6		\$	-	6 7			\$	-		7			\$	-
8		\$ -	8		\$	-	8			\$	-	· ·	3			\$	
9		\$ -	9		\$	-	9			\$	-		9			\$	-
10		\$ -	10		\$	-	10			\$	-	10	-0.0			\$	-
11		\$ -	11		\$	-	11			\$	-	11				\$	-
12		\$ -	12	Minor CPR	\$	40,000	12			\$	-	12			Minor CDD	\$	-
13		\$ - \$ -	13		\$	-	13 14			\$	-	13	-0.0		Minor CPR	\$	40,000
15	2.0" Mill and 2.0" Overlay	\$ 98,396	15		\$	-	15			\$	-	15				\$	-
16	2.0 Williama 2.0 Overlay	\$ -	16		\$	-	16			\$	-	16				\$	-
17		\$ -	17		\$	-	17			\$	-	17				\$	-
18		\$ -	18		\$	-	18			\$	-	18				\$	-
19		\$ -	19		\$	-	19			\$	-	19				\$	-
20	Seal Coat	\$ 25,000 \$ -	20	Major CPR	\$	150,000	20		2.0" Mill and 2.0" Overlay	\$	98,396	20				\$	-
21 22		\$ -	21 22		\$	-	22			\$	-	22				\$	-
23		\$ -	23		\$	-	23			\$	-	23				\$	
24		\$ -	24		\$	-	24			\$	-	24				\$	-
25		\$ -	25		\$	-	25		Seal Coat	\$	25,000	25			Major CPR	\$	150,000
26		\$ -	26		\$	-	26			\$	-	26				\$	-
27		\$ -	27		\$	-	27			\$	-	27				\$	-
28	2.0" Mill and 3.0" Overlay	\$ - \$ 139,052	28		\$	-	28 29			\$	-	28				\$	-
30	2.0 Williand 3.0 Overlay	\$ 139,032	30	Remove and Replace Concrete		456,000	30			\$	-	30				\$	-
31		\$ -	31		\$	-	31			\$	-	31				\$	-
32		\$ -	32		\$	-	32			\$	-	32				\$	-
33		\$ -	33		\$	-	33			\$	-	33				\$	-
34	Seal Coat	\$ 25,000	34 35	Demaining Coming Life Value**	\$	(305,520)	34		Remaining Service Life Value**	\$	-	34 35			Demoising Comice Life Value**	\$	-
35	Remaining Service Life Value**	\$ (69,526)	35	Remaining Service Life Value**	\$	(305,520)	35		Remaining Service Life value	Ф	-	35	0		Remaining Service Life Value**	Þ	-
					l												
					1					<u> </u>		II					
					-					<u> </u>		 					
					-							1					
												-					
										L							
										<u> </u>							
										<u> </u>		-					
				+	1					<u> </u>		-					
	Total Present Worth	\$ 281,544	<u> </u>	Total Present Worth	\$	489,128			Total Present Worth	2	380,347	-		<u> </u>	Total Present Worth	\$	558,274
	Eq. Annual Cost*	\$12,799		Eq. Annual Cost*		\$22,235			Eq. Annual Cost*		\$17,290				Eq. Annual Cost*		\$25,378
	% of Low Cost			% of Low Cost		174%			% of Low Cost		135%				% of Low Cost		198%
	* Equivalent Annual Cost is inclu	al a al fa u l'ofa una atl													* Equivalent Annual Cost is inclu	ما ه ما ده	- informatio

^{*} Equivalent Annual Cost is included for information only.

District	3
Performed By	CD
Analysis Period	35
Discount Rate	2.84

Project Number	7380-238	3
Date	2/6/2012	
Funding Category	RS 🔻	
Low Cost Option #	2	
Chosen Option #	1	

District	3
Performed By	CD
Analysis Period	35
Discount Rate	2.7

Project Number	7380-238					
Date	2/6	3/2012				
Funding Category	RS	•				
Low Cost Option #	1/2	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		DESCRIPTION	v
	6.0" SMA Overlay			7.0" Unbonded Overlay			9.0" Unbonded Overlay			6.0" Unbonded Overlay			6.0" Bituminous Overlay		DEGGIAII IIGI	•
	DESIGN LIFE	TYPE		DESIGN LIFE	TYPE			TYPE		DESIGN LIFE	TYPE		DESIGN LIFE	TYPE	DESIGN LIFE	TYPE
	15	BIT 🔻		15	PCC V	i	30	PCC		12	PCC V		12	BIT 🔻		BIT 🔻
Year # Lif		Cost/Mile	Year # L			Year #		Cost/Mile	Year # L		Cost/Mile	Year # I	ife Description	Cost/Mile Year	# Life Description	Cost/Mile
0	6.0" SMA Overlay	\$ 463,319	0	7.0" Unbonded Overlay	\$ 439,108	0	9.0" Unbonded Overlay	\$ 551,318		6.0" Unbonded Overlay	\$ 381.302	0	6.0" Bituminous Overlay	\$ 297,736 0		
1		\$ -	1		\$ -	1		\$ -	1		\$ -	1		\$ - 1		\$ -
2		\$ -	2		\$ -	2		\$ -	2		\$ -	2		\$ - 2		\$ -
3	Crack Treatment	\$ 2,500	3		\$ -	3		\$ -	3		\$ -	3	Crack Treatment	\$ 2,500 3 \$ - 4		\$ -
5		\$ - \$ -	5	_	\$ - \$ -	5		\$ - \$ -	5		\$ - \$ -	5	_	\$ - 4 \$ - 5		\$ - \$ -
6		\$ -	6		\$ -	6		S -	6		\$ -	6		S - 6		\$ -
7		\$ -	7		\$ -	7		\$ -	7		\$ -	7	Chip Seal	\$ 20,000 7		\$ -
8		\$ -	8		\$ -	8		\$ -	8		\$ -	8		\$ - 8		\$ -
9		\$ -	9		\$ -	9		\$ -	9	Reseal Joints & Partial Depth Re				\$ - 9		\$ -
10		\$ - \$ -	10		\$ -	10		\$ - \$ -	10	_	\$ - \$ -	10		\$ - 10 \$ - 11		\$ - \$ -
12		\$ - \$ -	12	Reseal Joints & Partial Depth F	\$ - Re \$ 29,283	12		\$ - \$ -	11		\$ - \$ -	11	Mill 2.0", Overlay 4.0", 2.0" Shi			\$ - \$ -
13		\$ -	13	Trootal Conno & Farian Deput I	\$ -	13		\$ -	13		\$ -	13	2.0 , 3.0.1ay 4.0 , 2.0 On	\$ - 13		\$ -
14		\$ -	14		\$ -	14		\$ -	14		\$ -	14		\$ - 14		\$ -
15	2.0" Mill & 4.0" SMA Overlay	\$ 292,231	15		\$ -	15	Reseal Joints & Partial Depth Re	\$ 23,301	15		\$ -	15	Crack Treatment	\$ 2,500 15		\$ -
16		\$ -	16		\$ -	16		\$ -	16		\$ -	16		\$ - 16		\$ -
17		\$ -	17		\$ - \$ -	17		\$ - \$ -	17	Major CPR	\$ 124,203			\$ - 17 \$. 18		\$ - \$ -
18	Crack Treatment	\$ 5,000 \$ -	18	_	\$ - \$ -	18 19		\$ - \$ -	18 19		\$ - \$ -	18 19	Chip Seal	\$ - 18 \$ 20,000 19		\$ - \$ -
20		\$ -	20	Major CPR	\$ 124,203	20		s -	20		\$.	20	Chip Seal	\$ - 20		\$ -
21		š -	21	major or it	\$ -	21		š -	21		š -	21		S - 21		š -
22		\$ -	22		\$ -	22		\$ -	22		\$ -	22		\$ - 22		\$ -
23		\$ -	23		\$ -	23		\$ -	23		\$ -	23	Mill 3.0" Overlay 5.0"	\$ 240,816 23		\$ -
24		\$ -	24		\$ -	24		\$ -	24		\$ -	24		\$ - 24		\$ -
25 26	2.5" Mill & 3.0" SMA Overlay	\$ - \$ 257.273	25 26		\$ - \$ -	25 26		\$ 116,897 \$ -	25 26		\$ - \$ -	25 26	0	\$ - 25 \$ 2,500 26		\$ - \$ -
27	2.5 Mill & 3.0 SMA Overlay	\$ 257,273	27	_	\$ -	27		\$ -	27	Remove and Replace Concrete		27	Crack Treatment	\$ 2,500 26 \$ - 27		s -
28		\$ -	28		\$ -	28		\$ -	28	Remove and Replace Concrete	\$ -	28		\$ - 28		\$ -
29	Crack Treatment	\$ 5,000	29		\$ -	29		\$ -	29		\$ -	29		\$ - 29		\$ -
30		\$ -	30	Remove and Replace Concrete	e \$ 503,893	30		\$ -	30		\$ -	30		\$ - 30		\$ -
31		\$ -	31		\$ -	31		\$ -	31		\$ -	31		\$ - 31		\$ -
32		\$ - \$ -	32		\$ - \$ -	32		\$ - \$ -	32		\$ -	32	Barrer and Barrer Indian	\$ - 32 Bi \$ 543,654 33		\$ - \$ -
34		\$ -	33		\$ -	33 34		\$ - \$ -	33		\$ -	33	Remove and Replace Inplace	Bi \$ 543,654 33 \$ - 34		\$ - \$ -
35	Remaining Service Life Value*	* \$ (25.727.30)		Remaining Service Life Value*	* \$ (335 928 67)		Remaining Service Life Value**		35	Remaining Service Life Value**	\$ (148 696 00)		Remaining Service Life Value*		Remaining Service Life Value**	
		4 (20): 2: 100)			+ (000)000000			•			* (,)			V (100)010100)		
\square	+	1	$\vdash \vdash \vdash$	1		lacksquare			$\vdash \vdash \vdash$			$\vdash \vdash \vdash$	1	1 1		1
\square	+	+	++	+	+	$\vdash \vdash \vdash$	+		$\vdash \vdash \vdash$	+		\vdash	+	1 1	++	1
		+	\vdash			\vdash		 	\vdash					+ +		+
	1		\vdash	1		\vdash	1						1			1
	1	1	$\sqcup \sqcup$			$\sqcup\sqcup$	1		$\blacksquare \bot \bot$	1		$oldsymbol{\sqcup}oldsymbol{\sqcup}$	+			1
\square			++	1	-	$\vdash \vdash$	+	 	$\vdash \vdash \vdash$	+		$\vdash\!\!\vdash\!\!\!\vdash$	1	1 1	++	1
-	+		++	+		\vdash	-		\vdash	-		++	+			1
	+	+	\vdash	+	+	\vdash	1		\vdash	1			+	+ +	+ +	+
<u> </u>	Total Present Worl	th \$ 777,417		Total Present Wort	h \$ 622,422		Total Present Worth	\$ 624,670		Total Present Worth	\$ 634,852		Total Present Wort	h \$ 647,272	Total Present Worth	n İ
	Eq. Annual Cos	t* \$35,340		Eq. Annual Cos	st* \$28,294		Eq. Annual Cost*	\$28,397		Eq. Annual Cost*	\$28,860		Eq. Annual Cos	it* \$29,424	Eq. Annual Cost	r*
	% of Low Co			% of Low Co	ost 100%		% of Low Cost	100%		% of Low Cost			% of Low Co	st 104%	% of Low Cos	st
	* Equivalent Annual Cost is inc	hudad for informati	on only							* Equivalent Annual Cost is inclu	ided for informat	ion only				

* Equivalent Annual Cost is included for information only.

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



Minnesota Department of Transportation

Dan Anderson
District Engineer

Memo

TO:

	FROM:	Darren Nelson
		Materials Engineer
	DATE:	11/29/12
	SUBJECT:	LCCA Exception for Pavement Preservation Project In reconditioning (RD), resurfacing (RS), or road repair (RX) funding categories
S.P.	7380-238 (TH 94)	
	e Cycle Cost Analysi Memo No. 10-04-M	is was performed in accordance with AT-01.
Both	PCC and HMA alter	natives were considered.
The a	alternative with the lo	owest Total Present Worth was: 7.0" Unbonded Overlay
		by the District is: 9.0" Unbonded Overlay
The ju	ustification for not se	electing the lowest cost alternative is:
The 9.0	0" was less than a 0.4%	increase in annual cost over a 35 year analysis period.
Given t	the fact that the Life Cyc	cle costs were nearly equal, the high amounts of interstate truck traffic,
and the	e fact that the 9" option i	required one less fix and traffic disruption over the next 35 years, the 9.0"
option	was selected.	27 27 27 27 27 27 27 27 27 27 27 27 27 2
The 9.0	0" option also provided a	a 30 year design life opposed to 15 years with the 7.0" option.
I cond	cur with the selected	I alternative,
District	alm P. Puu t Engineer	These 11/29/12 ADE Date
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	TIDE

7
John Hager
35
2.5

Project Number	8304-113
Date	12/6/2012
Funding Category	RD ▼
Low Cost Option #	1
Chosen Option #	1

OPTION #1								OPTION #2		OPTION #3										
			DESCRIPTION						DESCRIPTION		DESCRIPTION									
			3" Overlay with Novachip	1					7" Unbonded Overlay						Bituminous Reconstruct					
			DESIGN LIFE		TYPE				DESIGN LIFE	TYP					DESIGN LIFE	TYP				
			14	BI	T ▼ 1				20	PCC	▼ 2				20	BIT	• <mark>▼</mark> 1			
Year	#	Life	Description		Cost/Mile	Year	#	Life	Description	С	ost/Mile	Year	#	Life	Description	(	Cost/Mile			
0	ВВ		3" Overlay with Novachip	\$	397,458		ВС		7" Unbonded Overlay	\$	698,302		ΑZ		Bituminous Reconstruct	\$	1,742,847			
1				\$	-	1				\$	-	1				\$	-			
2				\$	-	2				\$	-	2				\$	-			
	AA		Crack Treatment	\$	3,000	3				\$	-	3				\$	-			
4				\$	-	4				\$	-	4				\$	-			
5				\$	-	5				\$	-	5				\$	-			
6				\$	-	6				\$	-	6				\$	-			
	AB		Surface Treatment	\$	20,000	7				\$	-	7				\$	-			
8				\$	-	8				\$	-		AA		Crack Treatment	\$	3,000			
9				\$	-	9				\$	-	9				\$	-			
10				\$	-	10				\$	-	10				\$	-			
11				\$	-	11				\$	-	11			Ourford Treatment	\$	-			
12				\$	-	12			December 145%	\$	-		AB		Surface Treatment	\$	20,000			
13	۸.	12	Off Mail 9, Off Overland	\$	-		AO		Reseal Joints (15')	\$	91,340	13				\$	-			
14	AJ	13	2" Mill & 3" Overlay	\$	150,981	14				\$	-	14				\$	-			
15				\$	-	15				\$	-	15				\$	-			
16	ΛΛ		Crash Trastanast	\$		16				\$	-	16				\$	-			
17	AA		Crack Treatment		3,000	17 18					-	17 18				\$	-			
18 19				\$	-	19				\$	-	19				\$				
20				\$	-	20				\$	-		AM		3" Mill & 4.5" Overlay	\$	244,929			
	AB		Surface Treatment	\$	20,000	21				\$	-	21	AIV		3 Will & 4.5 Overlay	\$	244,929			
22	Ab		Surface Treatment	\$	20,000	22				\$	-	22				\$				
23				\$	-	23				\$	-		AA		Crack Treatment	\$	3,000			
24				\$	-	24				\$	-	24			Crack Treatment	\$	-			
25				\$	-		AS		Major CPR (15')	\$	342,376	25				\$	-			
26				\$	-	26			ividjor or re (10)	\$	-	26				\$				
	AJ	12	2" Mill & 3" Overlay	\$	150,981	27				\$	-	27			Surface Treatment	\$	20,000			
28				\$	-	28				\$	_	28				\$				
29				\$		29				\$	-	29				\$	-			
30	AA		Crack Treatment	\$	3,000	30				\$	-	30				\$	-			
31				\$	-	31				\$	-	31				\$	-			
32				\$	-	32				\$	-	32				\$	-			
33				\$	-	33				\$	-	33				\$	-			
34	ΑB		Surface Treatment	\$	20,000	34				\$	-	34				\$	-			
35			4 years remaining service life	\$	-	35			No Remaining Service Life	\$	-	35			No Remaining Service Life	\$	-			
ļ		Щ		<u> </u>			<u> </u>						<u> </u>	<u> </u>		<u> </u>				
				<u> </u>			<u> </u>						<u> </u>	<u> </u>		<u> </u>				
		Ш		<b>!</b>			<b>!</b>						<b>!</b>	<b>!</b>		<u> </u>				
		Ш		<b>!</b>			<b>!</b>						<b>!</b>	<b>!</b>		<u> </u>				
<b> </b>				<u> </u>			<u> </u>			<del>                                     </del>		<u> </u>	<u> </u>	<u> </u>		<u> </u>				
		H		┝			┝			-			┝	┝		<u> </u>				
		H		┝			┝			-			┝	┝		<u> </u>				
		$\vdash$		<del>                                     </del>			<del>                                     </del>			-			<del>                                     </del>	<del>                                     </del>		-				
		$\vdash$		<del>                                     </del>			<del>                                     </del>			-			<del>                                     </del>	<del>                                     </del>		-				
		Щ	T-015 - 177 -		C2= 22 :	-	<u> </u>		Table 1981 1	ć	040.22-	_	<u> </u>	<u> </u>	Taran Salara	ć	4.024.52			
		ŀ	Total Present Worth	\$	625,384				Total Present Worth	\$	949,236				Total Present Worth	\$	1,921,621			
		ŀ	Eq. Annual Cost*	<u> </u>	\$27,020				Eq. Annual Cost*	-	\$41,012				Eq. Annual Cost*		\$83,025			
			% of Low Cost		100%				% of Low Cost		152%				% of Low Cost		307%			

^{*} Equivalent Annual Cost is included for information only.

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

#### Cost Analysis/ S.P. 8501-61/TH 14 From W. Jct. T.H. 74 to T.H. 61

Givens: Length = Width of Road = 1" Bituminous =

21.6 miles 24 feet(Conc.) 113 lbs/SY

24 feet(Bit.) 11/14/11-TRM

Interest Rate = 2.7 % Inflation Rate = 0 %

Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
1.5" MILL BITUMINOUS	224.00	SY	0.50	\$152,064.00	Initial Cost	0	\$133,184	1.000	\$133,184	\$5,930
PATCH		Ton	100.00	\$86,400,00	Rout & seal	2	\$2.000	0.948	\$1.896	\$84
TACK COAT		GAL	\$1.00	\$60,825.60	Chipseal	4	\$20,000	0.899	\$17,978	\$800
3" SPWEB340B	Wear	TON	50.00	\$2,577,484.80	Mill & 3" Overlay	17	\$133,184	0.636	\$84,675	\$3,770
		Total Cost:		\$2.876.774	Rout & seal	19	\$2.000	0.603	\$1,206	\$54
		Cost/Mile:		\$133,184	Chipseal	21	\$20,000	0.572	\$11,430	\$509
				******	Mill & 3" Overlay	33	\$133,184	0.415	\$55,288	\$2,462
					Rout & seal	35	\$2,000	0.394	\$787	\$35
					Remaining Life Value	35	(\$115,426)	0.394	-\$45,430	-\$2,023
						Total P	resent Worth:		\$261,014	\$11,62
						Equivalent	Annual Cost:		\$11.621	\$11.62°
						·				
7.5" Unbonded Over	lay(20 Y	ear Fix)								
Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
6" MILL BITUMINOUS		SY	2.00	\$608,256.00	Initial Cost	0	\$398,814	1.000	\$398,814	\$17,75
PASSRC		Ton	58.54	\$1,261,935.07	Minor CPR	15	\$150,000	0.671	\$100,585	\$4,478
Conc Std Width 7.5		SY	5.00	\$1,520,640.00	4.5" Bit. Overlay	22	\$164,499	0.556	\$91,541	\$4,076
Structural Concrete		CY	65.77	\$4,167,187.20	Remaining Life Value	35	(\$38,706)	0.394	-\$15,234	-\$678
Reinforcement Bars	Epoxy	lb	0.80	\$107,481.60			resent Worth:		\$575,706	\$25,63
Dowel Bars	Epoxy	each	5.20	\$948,879.36		Equivalent	Annual Cost:		\$25,633	\$25,63
		Total Cost:		\$8,614,379						
		Cost/Mile:		\$398,814						
MILL & 5" min. Bitur	ninous (	Overlay(20								
Item	Course	Unit	Price/Unit	Total Cost	Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
1.5" MILL BITUMINOUS		SY	0.50	\$152,064.00	Initial Cost	0	\$212,736	1.000	\$212,736	\$9,472
PATCH		Ton	100.00	\$86,400.00	Rout & seal	2	\$2,000	0.948	\$1,896	\$84
TACK COAT 5" SPWEB340B	Wear	GAL TON	\$1.00 50.00	\$60,825.60	Chipseal Mill & 3" Overlay	4 22	\$20,000	0.899 0.556	\$17,978	\$800 \$3,300
o orvvedo40B	vvear		50.00	\$4,295,808.00	,		\$133,184		\$74,114	
		Total Cost:		\$4,595,098	Rout & seal	24 26	\$2,000	0.528	\$1,055	\$47
		Cost/Mile:		\$212,736	Chipseal Remaining Life Value	26 35	\$20,000 (\$31,337)	0.500	\$10,005 -\$12,334	\$445 -\$549
					nemaining Life value		(\$31,337) resent Worth:	0.394	-\$12,334 <b>\$305,451</b>	-\$549 \$13,60
							Annual Cost:		\$13,600	\$13,60
					1	Lquivalent	Amuai Cost:		\$13,000	φ13,000

^{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 Bituminous over Bituminous-20 years, reclamation overlay-20 years, whitetopping-20 years, unbonded-20 years, heavy bituminous over concrete
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.

8
NAP
35
2.7

Project Number		8711-89					
Date	12/5	5/2011					
Funding Category	RS	-					
Low Cost Option #		1					
Chosen Option #							

8
NAP
35
2.7

OPTION#1			OPTION #2				OPTION #3				OPTION #4		
DESCRIPTION			DESCRIPTION				DESCRIPTION		i		DESCRIPTION		
3" MILL & 3" BITUMINOUS OVER	RLAY		MILL & UNBONDED OVERLAY	Y		4.5	" MILL & 4.5" BITUMINOUS OVE	RLAY			Historical Approach		
DESIGN LIFE	TYPE		DESIGN LIFE	TYPE			DESIGN LIFE	TYPE	l		DESIGN LIFE	TYPE	
15	BIT ▼		15	PCC ▼			20	BIT ▼	1		35	PCC	~
Year # Life Description	Cost/Mile	Year # Life	Description	Cost/Mile	Year #	#  Life	Description	Cost/Mile	Year #	‡  Lif	e Description	Co	st/Mile
0 AK 15 3" Mill & 3" Overlay	\$ 181,220	0 AY 15	Unbonded Concrete Overlay 15	\$ 838,929	0 A	M 20	4.5" Mill & 4.5" Overlay	\$ 247,625	0 A	M 2	1 4.5" Mill & 4.5" Overlay	\$	247,625
1	\$ -	1		\$ -	1	$\perp$		\$ -	1	$\perp$		\$	-
3	\$ - \$ -	3		\$ - \$ -	2	+		\$ - \$ -	3	+		\$	
4	\$ -	4		\$ -	4	+		\$ -	4	+		S	
5	\$ -	5		s -	5	+		\$ -	5 A	A	Crack Treatment	Š	7,000
6	\$ -	6		\$ -	6			\$ -	6 A	В	Surface Treatment	\$	21,000
7 AB Surface Treatment	\$ 21,000	7		\$ -	7 A	В	Surface Treatment	\$ 21,000	7	$\perp$		\$	-
8 9	\$ - \$ -	9		\$ - \$ -	8	+		\$ - \$ -	8	+		\$	-
10	\$ -	10 AP	Minor CPR (6'X6')	\$ 100,000	10	+		\$ -	10	+		\$	
11	\$ -	11	3.11(414)	\$ -	11			\$ -	11			\$	-
12	\$ -	12		\$ -	12			\$ -	12			\$	-
13	\$ -	13		\$ -	13 A		Crack Treatment	\$ 7,000	13			\$	-
14 2" Mill & 2" Overlay	\$ - \$ 110,791	14 15		\$ - \$ -	14 A	В	Surface Treatment	\$ 21,000 \$ -	14 15	+		\$	-
16 2 Mill & 2 Ovenay	\$ 110,791	16		\$ - \$ -	16	+		\$ - \$ -	16	+		\$	
17	\$ -	17		\$ -	17	+		\$ -	17	+		S	
18 AB Surface Treatment	\$ 21,000	18		\$ -	18	$\top$		\$ -	18	$\top$		\$	-
19	\$ -	19		\$ -	19			\$ -	19			\$	-
20	\$ -	20 AR	Major CPR (6'X6')	\$ 150,000	20 A	c _	1.5" Overlay	\$ 70,429	20			\$	-
21	\$ - \$ -	21		\$ - \$ -	21	+		\$ - \$ -	21 A	K	3" Mill & 3" Overlay	\$	181,220
22 23	\$ -	22		\$ -	22	+		\$ -	22	+		\$	
24	\$ -	24		\$ -	24	+		\$ -	24	+		\$	-
25 AK 3" Mill & 3" Overlay	\$ 181,220	24 25		\$ -	25			\$ -	24 25			\$	-
26	\$ -	26		\$ -	26			\$ -	26			\$	
27 28	\$ - \$ -	27 28		\$ - \$ -	27 A	C	1.5" Overlay	\$ 70,429 \$ -	27 A		Crack Treatment Surface Treatment	\$	7,000
29	\$ -	29		\$ -	29	+		\$ -	29	<del>-</del>	Surface Treatment	5	21,000
30	\$ -	30 AE	3" Overlay	\$ 140,859	30	+		\$ -	30	+		\$	-
31	\$ -	31		\$ -	31			\$ -	31			\$	-
32 AB Surface Treatment	\$ 21,000	32 33		\$ -	32	+		\$ -	32 33	_		\$	-
33 34	\$ - \$ -	33		\$ - \$ -	33 34 B		7.5" Mill & 4.5" Overlay	\$ 259,945	33	+		\$	
35 BD Remaining Service Life Value**	T	35 BE	Remaining Service Life Value**	7	35 B		Remaining Service Life Value**		35	+	Remaining Service Life Value**	\$	
The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s	(12,131)		9	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			g	(2.0,2.10)			g		
						$\top$				T			
		$\vdash$			$\vdash$	+			<b> </b> —	+		-	
I - I - I - I - I - I - I - I - I - I -		$\vdash$			$\vdash$	+		-	$\vdash$	+		+	
I <del></del>		<del>                                     </del>			$\vdash$	+		<u> </u>	$\vdash$	+		+	
						士				士			
										$\perp$			
		$\vdash$			$\vdash$	+			$\vdash$	+		-	
I <del></del>	<del>                                     </del>	$\vdash$		<del>                                     </del>	$\vdash$	+		<del>                                     </del>	$\vdash$	+		+	
					+	+			<b> </b>	+		+	
					$\perp$				┞			_	
Total Present Worth Eq. Annual Cost			Total Present Worth Eq. Annual Cost	\$ 1,019,371 \$45,386			Total Present Worth Eq. Annual Cost		l		Total Present Worth Eq. Annual Cost		388,587 \$17,301
% of Low Cost			% of Low Cost				% of Low Cost				% of Low Cos		108%
/6 OI LOW COS	1 100 /6		/s or LOW Cost	20476			/s or LOW Cost	10276			/s or LOW Cos	ч	100 /6

^{*} Equivalent Annual Cost is included for information only.

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

#### **DISTRICT 1 LIFE CYCLE COST ANALYSIS**

(General Pre-Scoping / Planning Estimate)

Worksheet

Date

8821-153 SP 11/1/2012 Alternate #1 Alternate #2 Alternate #3 Alternate #4 Mill 2" Pave 3.5" HMA Mill 4" Pave 5" HMA Mill 4" Pave 5" PCC Initial Project Descriptions 20 Year design 20 Year design 15 Year design \$189,728 35 2.70% First Cost in \$ / Mile Rehab Life in Yrs \$131,120 \$245,859 35 2.70% 3.20% Discount Rate % 2.70% YR \$0 \$0 \$0 \$0 \$0 3 Crack Seal \$2 200 B Crack Seal \$2,200 Preservation Options \$0 Micro-surface Chip Seal \$13,400 Chip Seal \$13,400 \$0 \$0 \$0 В Crack Seal \$0 \$0 \$0 Chip Se Crack Fill \$0 \$0 \$0 D 10 \$0 \$0 \$0 Medium Overlay Thick Overlay 12 13 \$102,564 \$0 \$0 \$0 \$0 \$0 Thin Mill and Overlay Medium Mill and Overlay Medium Mill and Overlay \$117,920 Thick Mill and Overlay 16 17 Reclaim and Overlay Joint Seal Diamond Grind 18 3 Crack Seal \$2,200 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 20 21 22 Ν Minor CPR \$0 Medium Mill and Overlay \$117.920 \$0 Major CPR Rubblize and Thick Overlay C Chip Seal \$13,400 Crack / Seat and Thick Overlay Minor CPR abd Diamond Grind B Crack Seal \$2,200 \$0 \$0 \$0 \$0 Major CPR and Diamond Grind O Major CPR \$166,320 Unbonded Overlay

Joint Seal and Minor CPR C Chip Seal \$0 \$0 28 29 Medium Mill and Overlay \$117,920 \$0 30 \$0 \$0 \$0 \$0 \$0 31 3 Crack Seal \$0 \$0 Residual Value 33 \$0 \$0 \$0 \$0 \$0 Residual Value Residual Value Residual Value (\$1) Residual Value (\$1) 38 \$0 \$0 \$0 \$0 \$0 \$0 40 41 \$0 \$0 \$0 42 \$0 \$0 43 \$0 44 \$0 \$0 \$0 46 48 \$0 \$0 \$0 Total Cost (Present Worth \$272 176 \$279.809 \$403 843 \$0 Annual Cost (Present Worth) \$12,118 \$12,458 \$17,981 100% 103% 148% 0% Data Furnished By:
Completed By: Derek Fredrickson