

2025 report on the

Life-Cycle Cost Analyses (LCCA)

January 2026

Prepared by:

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

February 12, 2026

The Honorable Brad Tabke, Co-Chair
House Transportation Finance & Policy Committee
5th Floor, Centennial Office Building
Saint Paul, MN 55155

The Honorable Scott Dibble, Chair
Senate Transportation Committee
3107 Minnesota Senate Building
Saint Paul, MN 55155

The Honorable Jon Koznick, Co-Chair
House Transportation Finance & Policy Committee
2nd Floor, Centennial Office Building
Saint Paul, MN 55155

The Honorable John Jasinski
Ranking Minority Member
Senate Transportation Committee
2227 Minnesota Senate Building
Saint Paul, MN 55155

RE: 2025 Life-Cycle Cost Analyses Report

Dear Legislators,

The Minnesota Department of Transportation is pleased to present the annual report on pavement life-cycle cost analyses, as required under [Minn. Stat. 174.185, subd. 3.](#)

In 2025, 16 construction projects were in the reconditioning, resurfacing and road repair funding categories and required a Life-Cycle Cost Analysis (LCCA) report according to the MnDOT Pavement Design Manual.

MnDOT has conducted LCCAs for road rehabilitation projects since 1999. In addition, MnDOT is innovating new methods to design and select the most cost-effective pavement structure. Innovations include new pavement design procedures and refinements to the alternate bidding process, which allow bidders for both pavement materials to compete on a project.

Please contact me if you have questions or comments about this report at nancy.daubenberger@state.mn.us, or you may contact Curt Turgeon curt.turgeon@state.mn.us or 651-366-5535.

Sincerely,



Nancy Daubenberger, P.E. (MN)
Commissioner

Table of Contents

Cover Letter	3
Table of Contents.....	4
Legislative Request	5
Life-Cycle Cost Analysis Report	8
Implementation	8
Results.....	8
Discussion	9
Conclusion.....	9
Appendix A: Summary of LCCA Results	11
Appendix B: Copies of LCCAs	14
Appendix C: Documents of Justification	30

Legislative Request

This report is issued to comply with [Minnesota Statute 174.185](#). Changes to this section were made in the 2024 Legislative Session and became effective on July 1, 2025. As a result, some of the projects within this report fell under the previous statutory reporting requirements.

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

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

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 must perform a life-cycle cost analysis and document the lowest life-cycle costs and all alternatives considered. The commissioner must document the chosen pavement strategy and, if the lowest life cycle is not selected, document the justification for the chosen strategy.

Subd. 2a. Review and collaboration.¹

(a) Before finalizing a pavement selection, the commissioner must post a draft of the life-cycle cost analysis and the draft pavement selection on the department's Office of Materials and Road Research website for 21 days. During this period, the commissioner must allow industry association representatives to submit questions and comments. The commissioner must collaborate with the

¹ NOTE: Subdivisions 2a and 2b, were added under MN Laws 2024, chapter 127, article 3, sections 76 and 77, effective July 1, 2025.

person who submitted the question or comment, where necessary, to ensure the commissioner fully understands the question or comment. The commissioner must respond to each question or comment in writing, which must include a description of any associated changes that will be made to the life-cycle cost analysis.

(b) After the review period under paragraph (a) closes, the commissioner may make revisions, when deemed appropriate, to the life-cycle cost analysis in response to questions or comments received. If the commissioner revises the type of pavement from concrete to asphalt or from asphalt to concrete, the commissioner must post the revised life-cycle cost analysis for review in accordance with the requirements under paragraph (a).

Subd. 2b. Selection.

(a) After the review period required in subdivision 2a and any subsequent changes to the analysis, the commissioner must select the pavement strategy and prepare a document of justification. At a minimum, the document of justification must:

(1) explain why the pavement strategy was selected;

(2) if the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected; and

(3) include all questions and comments received during the review period and the commissioner's responses to each.

(b) The commissioner must submit the analysis and document of justification to a licensed professional engineer for review. A life-cycle cost analysis is not considered final until it is certified and signed by a licensed professional engineer as provided by Minnesota Rules, part [1800.4200](#).

(c) For all projects that began construction on or after January 1, 2024, the commissioner must store all life-cycle cost analyses and documents of justification on the department's website in a manner that allows the public to easily access the documents.

(d) After completing the certification and signature requirements in paragraph (b) and the posting requirements in paragraph (c), the commissioner may advance the project to substantial plan development.

(e) For purposes of this subdivision, "substantial plan development" means the point in time during the plan development process after which any further activities would preclude any of the feasible pavement alternatives from being selected or constructed.

Subd. 3. Report.

By January 31 of each year, the commissioner must report to the chairs and ranking minority members of the legislative committees with jurisdiction over transportation policy and finance on life-cycle cost analyses conducted under this section. At a minimum, the report must include information on the results of the analyses under subdivision 2, the public review under subdivision 2a, and the final selection and document of justification under subdivision 2b.

Life-Cycle Cost Analysis Report

Implementation

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

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

The LCCA process, which is consistent with Federal Highway Administration (FHWA) guidelines, is performed on all pavement projects regardless of funding category, but only the results of projects in the reconditioning, resurfacing and road repair funding categories are included in this report. The LCCA process limits the requirement to perform a LCCA to projects with more than 60,000 square yards of pavement and to projects that include placing more than two-inch thickness of pavement material. Thin overlays (two inches or less) are considered short-term preventive maintenance and lack a viable concrete alternative with an equal design life.

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

Results

In 2025, 16 construction projects were in the reconditioning, resurfacing and road repair funding categories and required a LCCA according to the MnDOT Pavement Design Manual.

The results of the 16 LCCAs are as follows:

- Hot-mix asphalt was the low-cost option for 12 LCCAs and all were selected for construction.
- Portland cement concrete was the low-cost option for 4 LCCA and were selected for construction.

A table of LCCA results and copies of the LCCAs submitted by MnDOT districts are attached.

Discussion

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

MnDOT continues to improve and refine its portland cement pavement design procedures. The design program for portland cement pavement thickness design has been updated, and a research project is developing a new procedure to design portland cement concrete pavements that are built on top of existing portland cement concrete pavements.

No projects used the alternate bidding process in 2025, but MnDOT continued to provide for its use on projects that were likely to have competitive hot-mix asphalt and portland cement concrete options.

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

The process is as follows:

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

Conclusion

The Minnesota Department of Transportation remains committed to meeting statutory requirements for life-cycle cost analysis (LCCA) while advancing pavement design practices that promote long-term value and sustainability. The 2025 LCCA results reaffirm that hot-mix asphalt continues to be the most cost-effective option for the majority of rehabilitation projects, primarily due to its lower initial costs and suitability for shorter design lives. However, portland cement concrete remains a viable alternative in select cases and offers potential advantages in durability and reduced maintenance over extended periods.

MnDOT's ongoing efforts to refine pavement design methodologies, including updates to portland cement concrete thickness design and research into innovative overlay strategies, demonstrate a proactive approach to improving performance and cost efficiency. Additionally, the continued availability of alternate bidding processes ensures flexibility and transparency in project delivery, even though no projects utilized this method in 2025.

Looking forward, MnDOT will continue to integrate research findings, technological advancements, and industry best practices into its pavement design and LCCA processes. These efforts will help ensure that Minnesota's transportation infrastructure is built and maintained in a manner that optimizes taxpayer investment, supports long-term durability, and meets the evolving needs of the traveling public.

Appendix A: Summary of LCCA Results

State Project Number (SP#)	Existing Pavement Type	Exception for low-cost option?	Design Life (in years)	Option Description	Present Worth	Optional Material (1)	Selected Option (2)	Alternate Bid? (3)
1981-140	PCC	No	20	New HMA	\$20,584,493.87	HMA		No
			20	PCC Overlay	\$20,487,538.84	PCC		
			35	PCC Overlay	\$15,940,400.13	PCC	X	
3004-65	HMA	No	20	CIR	\$10,619,158.58	HMA	X	No
			20	PCC Overlay	\$15,924,714.49	PCC		
			35	PCC Overlay	\$17,402,594.35	PCC		
3412-76	PCC	No	20	New HMA	\$14,393,209.00	HMA		No
			20	PCC Overlay	\$15,674,027.65	PCC		
			35	PCC Overlay	\$12,635,542.73	PCC	X	
4603-52	BOC	No	15	M&OL	\$1,202,550.09	HMA	X	No
			20	New HMA	\$1,923,185.54	HMA		
			20	New PCC	\$2,173,340.62	PCC		
5080-179	BOC	No	15	M&OL	\$11,454,056.34	HMA	X	No
			20	New HMA	\$22,605,110.02	HMA		
			20	PCC Overlay	\$18,444,958.15	PCC		
5502-106	BOC	No	15	M&OL	\$1,681,739.06	HMA	X	No
			20	PCC Overlay	\$3,432,853.90	PCC		
			20	M&OL	\$1,827,695.82	HMA		
5604-09	HMA	No	15	M&OL	\$4,967,198.58	HMA	X	No
			20	FDR	\$5,052,391.87	HMA		
			20	PCC Overlay	\$9,462,113.35	PCC		
5680-147	HMA	No	20	PCC Overlay	\$19,902,837.74	PCC		No
			20	New HMA	\$20,504,710.83	HMA		
			35	PCC Overlay	\$16,441,329.89	PCC	X	
6102-25	HMA	No	20	PCC Overlay	\$14,975,810.23	PCC		No
			20	FDR	\$8,551,582.41	HMA	X	
			35	New PCC	\$14,581,376.65	HMA		
6803-43	HMA	No	20	FDR	\$14,656,230.07	HMA	X	No
			20	New PCC	\$31,509,997.38	PCC		
			35	New PCC	\$25,461,106.61	PCC		

State Project Number (SP#)	Existing Pavement Type	Exception for low-cost option?	Design Life (in years)	Option Description	Present Worth	Optional Material (1)	Selected Option (2)	Alternate Bid? (3)
6918-103	BOC	No	20	PCC Overlay	\$4,220,122.44	PCC		No
			20	New HMA	\$3,817,608.58	HMA		
			35	PCC Overlay	\$3,460,335.40	PCC	X	
6930-41	HMA	No	20	PCC Overlay	\$24,027,014.04	PCC		No
			20	FDR	\$14,790,103.72	HMA	X	
			35	New PCC	\$25,912,765.63	PCC		
8201-21	HMA	No	20	New PCC	\$5,132,182.85	PCC		No
			20	New HMA	\$4,591,236.24	HMA	X	
			35	New PCC	\$4,709,966.01	PCC		
8580-175	BOC	No	15	M&OL	\$5,203,107.86	HMA	X	No
			20	PCC Overlay	\$12,363,790.66	PCC		
			20	M&OL	\$7,519,157.03	HMA		
8580-178	BOC	No	15	M&OL	\$10,094,267.58	HMA	X	No
			20	M&OL	\$10,642,640.52	HMA		
			20	PCC Overlay	\$19,230,138.00	PCC		
8580-179	BOC	No	15	M&OL	\$5,744,768.87	HMA	X	No
			20	M&OL	\$6,369,905.78	HMA		
			20	PCC Overlay	\$11,100,817.17	PCC		

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

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

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

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

Definitions:

HMA = Hot-Mix Asphalt

M&OL = Mill and overlay HMA

PCC = Portland Cement Concrete

BOC = Bituminous over Concrete

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

SFDR = Stabilized Full-Depth Reclamation (recycle existing HMA and Base stabilized with emulsion or foamed asphalt to use as a new base)

UBOL= Unbonded Concrete Overlay

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

CPR = Concrete Pavement Repair

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

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

Appendix B: Copies of LCCAs

50-Year Analysis Period

DELETE LCCA
INPUTS

Project Number	Analysis Period
1981-140	50
Highway	Discount Rate
I-35W	0.66%
Date	District 5 2021/2022 Prices
11/21/2022	
Performed By	
Benjamin Nixa	

Change to:
50-Year
Analysis
Period

Change to:
35-Year
Analysis
Period

Notes:

LCCA SUMMARY				
	Alternate #1	Alternate #2	Alternate #3	Length
Segment #1	35 Year UBOL	20 year HMA	20 year PCC UBOL	1.8
Net Present Cost	\$7,776,622.15	\$11,272,099.51	\$10,309,308.38	Miles
Segment #2	35 Year PCC Reconstruct Under BR 195	20 Year HMA Reconstruct Under BR 195	20 Year PCC Reconstruct Under BR 195	0.2
Net Present Cost	\$826,112.18	\$948,077.27	\$1,032,077.58	Miles
Segment #3	35 Year PCC	20 Year HMA	20 Year PCC	1.0
Net Present Cost	\$5,315,134.00	\$6,105,106.20	\$6,693,642.30	Miles
Segment #4	35 Year PCC Reconstruct	20 Year HMA	20 Year PCC	0.4
Net Present Cost	\$1,986,531.80	\$2,259,210.90	\$2,452,510.59	Miles
Project Net Present Cost	\$15,904,400.13	\$20,584,493.87	\$20,487,538.84	Total
% of Low Cost	100.0%	129.4%	128.8%	3.3

50-Year Analysis Period

DELETE LCCA
INPUTS

Project Number	Analysis Period
3004-65	50
Highway	Discount Rate
65	0.82%
Date	
8/27/2024	
Performed By	
sjn	District 3 2023/2024 Prices

Change to:
50-Year
Analysis
Period

Change to:
35-Year
Analysis
Period

Version 3 11/13/2023

Notes:

LCCA SUMMARY				
	Alternate #1	Alternate #2	Alternate #3	Length
Segment #1	3" Mill, 4" CIR, 3" HMA, Remove Shld	5" Whitetopping	8.5" UBOL	10.2
Net Present Cost	\$10,619,158.58	\$15,924,714.49	\$17,402,594.35	Miles
Segment #2				0.0
Net Present Cost				Miles
Segment #3				0.0
Net Present Cost				Miles
Segment #4				0.0
Net Present Cost				Miles
Project Net Present Cost	\$10,619,158.58	\$15,924,714.49	\$17,402,594.35	Total
% of Low Cost	100.0%	150.0%	163.9%	10.2

50-Year Analysis Period

DELETE LCCA INPUTS

Project Number	Analysis Period
3412-76	50
Highway	Discount Rate
71 & 23	0.82%
Date	District 8 2023/2024 Prices
12/23/2025	
Performed By	
Jacob Miller	

Change to:
50-Year
Analysis
Period

Change to:
35-Year
Analysis
Period

Version 3 11/13/2023

Notes: [20 Year HMA Reconstruct] vs [20 Year unbonded PCC Overlay] vs [35 Year PCC UBOL].
 Segment 1: 10' shoulders, 12' mainlines to 9' shoulders, 13' mainlines. | Segment 2: 4' shoulder, 12' main, 12' main, 10' shoulder to 4', 12', 13', 9'.
 Reconstruct: 7" HMA, 6" CL 5, 23" SGM
 UBOL: Mill HMA to 7.5" below grade, 7.5" doweled PCC Overlay.

LCCA SUMMARY				
	Alternate #1	Alternate #2	Alternate #3	Length
Segment #1	HMA Reconstruct	20 yr PCC Overlay	35 yr PCC Overlay	2.3
Net Present Cost	\$4,478,552.94	\$4,818,380.33	\$3,820,858.92	Miles
Segment #2	4' Shoulders	4' Shoulders	4' Shoulders	5.5
Net Present Cost	\$9,914,656.06	\$10,855,647.33	\$8,814,683.80	Miles
Segment #3				0.0
Net Present Cost				Miles
Segment #4				0.0
Net Present Cost				Miles
Project Net Present Cost	\$14,393,209.00	\$15,674,027.65	\$12,635,542.73	Total
% of Low Cost	113.9%	124.0%	100.0%	7.8

35-Year Analysis Period

DELETE LCCA
INPUTS

Project Number	Analysis Period
SP 4603-52	35
Highway	Discount Rate
TH 15	3.10%
Date	District 7 2024/2025 Prices
11/4/2024	
Performed By	
Max McCabe	

Change to:
50-Year
Analysis
Period

Change to:
35-Year
Analysis
Period

Version 1 7/11/2024

Notes:

LCCA SUMMARY				
	Alternate #1	Alternate #2	Alternate #3	Length
Segment #1	3" Mill and Overlay	20 year Bituminous Construction	20 year Concrete Construction	1.5
Net Present Cost	\$1,202,550.09	\$1,923,185.54	\$2,173,340.62	Miles
Segment #2				0.0
Net Present Cost				Miles
Segment #3				0.0
Net Present Cost				Miles
Segment #4				0.0
Net Present Cost				Miles
Project Net Present Cost	\$1,202,550.09	\$1,923,185.54	\$2,173,340.62	Total
% of Low Cost	100.0%	159.9%	180.7%	1.5

35-Year Analysis Period

DELETE LCCA
INPUTS

Project Number	Analysis Period
5080-179	35
Highway	Discount Rate
I-90 WB	0.82%
Date	District 6 2023/2024 Prices
6/14/2024	
Performed By	
trm	

Change to:
50-Year
Analysis
Period

Change to:
35-Year
Analysis
Period

Version 3 11/13/2023

I-90 WB From CSAH 46(Austin) to 0.4 Mi. E. TH 16, RP 180.807-193.746 = 12.941mi.

LCCA SUMMARY				
	Alternate #1	Alternate #2	Alternate #3	Length
Segment #1	15 YR HMA- 1.5" Mill And 3" Overlay	20 YR HMA- reconstruct	20 YR PCC- 7" doweled UBOL	1.3
Net Present Cost	\$925,976.23	\$2,341,368.56	\$1,899,281.45	Miles
Segment #2	15 YR HMA- 4.5" Overlay	20 YR HMA- Reconstruct w/ HMA	20 YR PCC- 7" doweled UBOL	11.7
Net Present Cost	\$10,528,080.10	\$20,263,741.46	\$16,545,676.70	Miles
Segment #3				0.0
Net Present Cost				Miles
Segment #4				0.0
Net Present Cost				Miles
Project Net Present Cost	\$11,454,056.34	\$22,605,110.02	\$18,444,958.15	Total
% of Low Cost	100.0%	197.4%	161.0%	12.9

35-Year Analysis Period

DELETE LCCA
INPUTS

Project Number	Analysis Period
5502-106	35
Highway	Discount Rate
14 EB & WB	0.66%
Date	District 6 2021/2022 Prices
6/20/2023	
Performed By	
trm	

Change to:
50-Year
Analysis
Period

Change to:
35-Year
Analysis
Period

TH 14 EB & WB From S. Jct. TH 52 to CSAH 36/Marion Rd. (Exception at S. Broadway Intersection from 213.349-213.779) 212.72-214.793

LCCA SUMMARY				
	Alternate #1	Alternate #2	Alternate #3	Length
Segment #1	15 YR HMA-3" Mill and Fill	20 YR PCA-7" Whitetopping	20 YR HMA-3" Mill and 5.5" Overlay	3.4
Net Present Cost	\$1,681,739.06	\$3,432,853.90	\$1,827,695.82	Miles
Segment #2				0.0
Net Present Cost				Miles
Segment #3				0.0
Net Present Cost				Miles
Segment #4				0.0
Net Present Cost				Miles
Project Net Present Cost	\$1,681,739.06	\$3,432,853.90	\$1,827,695.82	Total
% of Low Cost	100.0%	204.1%	108.7%	3.4

35-Year Analysis Period

DELETE LCCA
INPUTS

Project Number	Analysis Period
5604-09	35
Highway	Discount Rate
TH 210	1.02%
Date	District 4 2020/2021 Prices
2/3/2021	
Performed By	
Nathan Bausman	

Change to:
50-Year
Analysis
Period

Change to:
35-Year
Analysis
Period

Notes:

LCCA SUMMARY				
	Alternate #1	Alternate #2	Alternate #3	Length
Segment #1	2" Mill & 3" Bituminous Overlay	Mill, 6" Reclaim & 4" Bituminous Over	3.5" Mill & 5" Whitetopping	1.2
Net Present Cost	\$550,527.68	\$570,627.52	\$1,072,428.05	Miles
Segment #2	4" Mill & 3" Bituminous Overlay	Mill, 6" Reclaim & 4" Bituminous Over	3.5" Mill & 5" Whitetopping	7.0
Net Present Cost	\$3,250,839.65	\$3,252,809.79	\$6,113,277.64	Miles
Segment #3	2" Mill & 3" Bituminous Overlay	Mill, 6" Reclaim & 4" Bituminous Over	1.5" Mill & 5" Whitetopping	2.7
Net Present Cost	\$1,165,831.25	\$1,228,954.56	\$2,276,407.65	Miles
Segment #4				0.0
Net Present Cost				Miles
Project Net Present Cost	\$4,967,198.58	\$5,052,391.87	\$9,462,113.35	Total
% of Low Cost	100.0%	101.7%	190.5%	10.9

50-Year Analysis Period

DELETE LCCA
INPUTS

Project Number	Analysis Period
5680-147	50
Highway	Discount Rate
I-94 EB	0.66%
Date	District 4 2021/2022 Prices
7/23/2021	
Performed By	
Nathan Bausman	

Change to:
50-Year
Analysis
Period

Change to:
35-Year
Analysis
Period

Notes:

LCCA SUMMARY				
	Alternate #1	Alternate #2	Alternate #3	Length
Segment #1	8.5" Unbonded Concrete Overlay	7.5" Unbonded Concrete Overlay	10" Bituminous Reconstruction	12.4
Net Present Cost	\$14,305,575.73	\$17,501,280.13	\$18,773,655.15	Miles
Segment #2	8.5" Concrete Reconstruction	7.5" Concrete Reconstruction	10" Bituminous Reconstruction	1.0
Net Present Cost	\$1,881,620.99	\$2,136,800.88	\$1,618,268.71	Miles
Segment #3	10.5" Concrete Reconstruction	10.5" Concrete Reconstruction	10" Bituminous Reconstruction	0.1
Net Present Cost	\$254,133.18	\$264,756.73	\$112,786.96	Miles
Segment #4				0.0
Net Present Cost				Miles
Project Net Present Cost	\$16,441,329.89	\$19,902,837.74	\$20,504,710.83	Total
% of Low Cost	100.0%	121.1%	124.7%	13.5

35-Year Analysis Period

DELETE LCCA
INPUTS

Project Number	Analysis Period
6102-25	35
Highway	Discount Rate
TH 28	1.02%
Date	District 4 2020/2021 Prices
6/2/2021	
Performed By	
Nathan Bausman	

Change to:
50-Year
Analysis
Period

Change to:
35-Year
Analysis
Period

Notes: Segment 4 and Segment 5 combined into Segment 4 for the Life Cycle Cost Analysis

LCCA SUMMARY				
	Alternate #1	Alternate #2	Alternate #3	Length
Segment #1	Mill, 6" Reclaim & 4.5" Bituminous Ov	4" Mill & 4.5" Whitetopping	7" Concrete Reconstruction	0.8
Net Present Cost	\$365,786.48	\$619,858.71	\$650,284.03	Miles
Segment #2	Mill, 6" Reclaim & 4.5" Bituminous Ov	4" Mill & 4.5" Whitetopping	7" Concrete Reconstruction	13.7
Net Present Cost	\$6,673,053.17	\$11,506,554.61	\$11,656,915.22	Miles
Segment #3	5" Bituminous Reconstruction	7" Concrete Reconstruction	7" Concrete Reconstruction	0.5
Net Present Cost	\$578,135.09	\$968,537.03	\$578,374.93	Miles
Segment #4	Mill, 6" Reclaim & 6" Bituminous Ove	4.5" Mill & 5" Whitetopping	7" Concrete Reconstruction	1.8
Net Present Cost	\$934,607.67	\$1,880,859.89	\$1,695,802.47	Miles
Project Net Present Cost	\$8,551,582.41	\$14,975,810.23	\$14,581,376.65	Total
% of Low Cost	100.0%	175.1%	170.5%	16.8

50-Year Analysis Period

DELETE LCCA
INPUTS

Project Number	Analysis Period
6803-43	50
Highway	Discount Rate
11	0.66%
Date	District 2 2021/2022 Prices
4/6/2022	
Performed By	
KO	

Change to:
50-Year
Analysis
Period

Change to:
35-Year
Analysis
Period

Notes:

LCCA SUMMARY				
	Alternate #1	Alternate #2	Alternate #3	Length
Segment #1	4" mill, 8" FDR	20 yr concrete	Conc. 35 Yr	13.6
Net Present Cost	\$8,854,669.31	\$21,199,921.93	\$17,153,525.18	Miles
Segment #2	New alignment	New Alignment-new conc	New alignment 35 yr conc	1.6
Net Present Cost	\$1,636,118.67	\$2,459,002.89	\$1,930,873.98	Miles
Segment #3	Reclaim Widening	Conc. widened section	Conc. widened section	2.6
Net Present Cost	\$3,288,732.73	\$5,518,102.47	\$4,430,425.26	Miles
Segment #4	5" Mill, 12" FDR	20 yr Conc	35 yr Conc	1.5
Net Present Cost	\$876,709.37	\$2,332,970.09	\$1,886,282.19	Miles
Project Net Present Cost	\$14,656,230.07	\$31,509,997.38	\$25,461,106.61	Total
% of Low Cost	100.0%	215.0%	173.7%	19.2

50-Year Analysis Period

DELETE LCCA
INPUTS

Project Number	Analysis Period
6918-103	50
Highway	Discount Rate
53	0.82%
Date	District 1 2023/2024 Prices
8/6/2024	
Performed By	
Sarah BaeHurst	

Change to:
50-Year
Analysis
Period

Change to:
35-Year
Analysis
Period

Version 3 11/13/2023

Notes:

LCCA SUMMARY				
	Alternate #1	Alternate #2	Alternate #3	Length
Segment #1	35 Year UBOL	20 Year UBOL	New HMA	1.8
Net Present Cost	\$3,460,335.40	\$4,220,122.44	\$3,817,608.58	Miles
Segment #2				0.0
Net Present Cost				Miles
Segment #3				0.0
Net Present Cost				Miles
Segment #4				0.0
Net Present Cost				Miles
Project Net Present Cost	\$3,460,335.40	\$4,220,122.44	\$3,817,608.58	Total
% of Low Cost	100.0%	122.0%	110.3%	1.8

50-Year Analysis Period

DELETE LCCA
INPUTS

Project Number	Analysis Period
6930-41	50
Highway	Discount Rate
TH 73	0.82%
Date	
	District 1
Performed By	2023/2024 Prices

Change to:
50-Year
Analysis
Period

Change to:
35-Year
Analysis
Period

Version 3 11/13/2023

Notes:

LCCA SUMMARY				
	Alternate #1	Alternate #2	Alternate #3	Length
Segment #1	FDR	White Topping	New PCC	14.8
Net Present Cost	\$11,738,257.82	\$19,051,885.12	\$22,329,666.13	Miles
Segment #2	Reconstruct	New PCC	New PCC	2.4
Net Present Cost	\$3,051,845.90	\$4,975,128.92	\$3,583,099.50	Miles
Segment #3				0.0
Net Present Cost				Miles
Segment #4				0.0
Net Present Cost				Miles
Project Net Present Cost	\$14,790,103.72	\$24,027,014.04	\$25,912,765.63	Total
% of Low Cost	100.0%	162.5%	175.2%	17.2

50-Year Analysis Period

DELETE LCCA
INPUTS

Project Number	8201-21	Analysis Period	50
Highway	97	Discount Rate	0.82%
Date	10/17/2023		
Performed By	RP		
		District 5 2023/2024 Prices	

Change to:
50-Year
Analysis
Period

Change to:
35-Year
Analysis
Period

Version 2 10/5/2023

Notes: 20 yr bituminous reconstruct is the low cost option.

LCCA SUMMARY				
	Alternate #1	Alternate #2	Alternate #3	Length
Segment #1	20 yr Bituminous	20 yr PCC	35 yr PCC	1.7
Net Present Cost	\$4,591,236.24	\$5,132,182.85	\$4,709,966.01	Miles
Segment #2				0.0
Net Present Cost				Miles
Segment #3				0.0
Net Present Cost				Miles
Segment #4				0.0
Net Present Cost				Miles
Project Net Present Cost	\$4,591,236.24	\$5,132,182.85	\$4,709,966.01	Total
% of Low Cost	100.0%	111.8%	102.6%	1.7

35-Year Analysis Period

DELETE LCCA
INPUTS

Project Number	Analysis Period
SP 8580-175	35
Highway	Discount Rate
I-90 EB & WB	0.66%
Date	District 6 2021/2022 Prices
3/14/2022	
Performed By	
trm	

Change to:
50-Year
Analysis
Period

Change to:
35-Year
Analysis
Period

Notes: I-90 EB & WB From 0.7 Mi. W. CSAH 12(Nodine) to 0.3 Mi. W. CSAH 12(Dakota)

LCCA SUMMARY				
	Alternate #1	Alternate #2	Alternate #3	Length
Segment #1	15 YR HMA(1.5" mill & 3" BO)(RURAL)	20 YR PCC-7" UBOL(RURAL)	20 YR HMA(3.5" Mill & 5.5" BO)(RURAL)	3.6
Net Present Cost	\$1,746,731.17	\$3,947,868.68	\$1,966,297.63	Miles
Segment #2	15 YR HMA(3.5" Mill and Fill)(URBAN)	20 YR PCC-7" UBOL	20 YR HMA (3.5" Mill and 5.5" BO)	6.1
Net Present Cost	\$3,456,376.69	\$8,415,921.98	\$5,552,859.40	Miles
Segment #3				0.0
Net Present Cost				Miles
Segment #4				0.0
Net Present Cost				Miles
Project Net Present Cost	\$5,203,107.86	\$12,363,790.66	\$7,519,157.03	Total
% of Low Cost	100.0%	237.6%	144.5%	9.7

35-Year Analysis Period

DELETE LCCA
INPUTS

Project Number	Analysis Period
8580-178	35
Highway	Discount Rate
I-90 WB	0.82%
Date	District 6
6/13/2024	
Performed By	2023/2024 Prices
trm	

Change to:
50-Year
Analysis
Period

Change to:
35-Year
Analysis
Period

Version 3 11/13/2023

I-90 WB From RP 235.113-249.503, 2.3 Mi. E. TH 74 to 0.5 Mi. W. S. Jct. TH 43

LCCA SUMMARY				
	Alternate #1	Alternate #2	Alternate #3	Length
Segment #1	15 YR HMA- 1.5" Mill And 3" Overlay	20 YR HMA- 3" Mill and 5" Overlay	20 YR PCC- 7" doweled UBOL	14.2
Net Present Cost	\$10,094,267.58	\$10,642,640.52	\$19,230,138.00	Miles
Segment #2				0.0
Net Present Cost				Miles
Segment #3				0.0
Net Present Cost				Miles
Segment #4				0.0
Net Present Cost				Miles
Project Net Present Cost	\$10,094,267.58	\$10,642,640.52	\$19,230,138.00	Total
% of Low Cost	100.0%	105.4%	190.5%	14.2

35-Year Analysis Period

DELETE LCCA
INPUTS

Project Number	Analysis Period
8580-179	35
Highway	Discount Rate
90	3.10%
Date	District 6 2024/2025 Prices
6/23/2025	
Performed By	
J. Slattery	

Change to:
50-Year
Analysis
Period

Change to:
35-Year
Analysis
Period

Version 4 1/29/2025

Notes:

LCCA SUMMARY				
	Alternate #1	Alternate #2	Alternate #3	Length
Segment #1	1.5" Mill and 3.0" Overlay	7.0" UBOL	3.0" Mill and 5.0" Overlay	8.3
Net Present Cost	\$5,744,768.87	\$11,100,817.17	\$6,369,905.78	Miles
Segment #2				0.0
Net Present Cost				Miles
Segment #3				0.0
Net Present Cost				Miles
Segment #4				0.0
Net Present Cost				Miles
Project Net Present Cost	\$5,744,768.87	\$11,100,817.17	\$6,369,905.78	Total
% of Low Cost	100.0%	193.2%	110.9%	8.3

Appendix C: Documents of Justification

Document of Justification for 1981-140 TH 35W

This document of justification is to meet the requirements of 2024 Minnesota Statute 174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

1. Why the pavement strategy was selected:

Three rehabilitation alternatives were considered and two of them had equal design lives as required by Minnesota Statute 174.185. The district wanted a long-term rehabilitation alternative that would improve ride, preserve existing roadway structure, and reduce maintenance costs. The 35-year PCC alternative was selected for having the lowest Project Net Present Cost.

2. If the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected:

The 35-year PCC alternative was selected for having the lowest Project Net Present Cost.

3. Include all questions and comments received during the review period and the commissioner's responses to each:

This project was not reviewed by Minnesota Asphalt Pavement Association (MAPA) or Concrete Paving Association of Minnesota (CPAM). The letting date for this project was February 7, 2025.

Document of Justification for 3004-65 TH 65

This document of justification is to meet the requirements of 2024 Minnesota Statute 174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

1. Why the pavement strategy was selected:

Three rehabilitation alternatives were considered and two of them had equal design lives as required by Minnesota Statute 174.185. The district wanted a long-term rehabilitation alternative that would improve ride, extend pavement life, and reduce maintenance costs. The 20-year HMA CIR alternative was selected for having the lowest Project Net Present Cost.

2. If the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected:

The 20-year HMA CIR alternative was selected for having the lowest Project Net Present Cost.

3. Include all questions and comments received during the review period and the commissioner's responses to each:

This project was not reviewed by Minnesota Asphalt Pavement Association (MAPA) or Concrete Paving Association of Minnesota (CPAM). The letting date for this project is January 28, 2026.

Document of Justification for

3412-76 TH 71/23

Willmar Bypass

This document of justification is to meet the requirements of 2024 Minnesota Statute 174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

4. Why the pavement strategy was selected:

Three rehabilitation alternatives were considered and two of them had equal design lives as required by Minnesota Statute 174.185. The district wanted a long-term rehabilitation alternative that would improve ride, reduce maintenance costs, and update the existing guardrail. The 35-year concrete overlay had the lowest Project Net Present Cost over a 50-year analysis period out of three long life rehabilitation alternatives that were considered.

5. If the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected:

The 35-year concrete overlay had the lowest Project Net Present Cost out of the three rehabilitation alternates that were considered.

6. Include all questions and comments received during the review period and the commissioner's responses to each:

The Life Cycle Cost Analysis and supporting documentation were sent out to Minnesota Asphalt Pavement Association (MAPA) and Concrete Paving Association of Minnesota (CPAM) on January 24, 2024, and no comments were received.

Document of Justification for 4603-52 TH 15

This document of justification is to meet the requirements of 2024 Minnesota Statute 174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

1. Why the pavement strategy was selected:

Three rehabilitation alternatives were considered and two of them had equal design lives as required by Minnesota Statute 174.185. The district wanted a medium-term rehabilitation alternative that would improve ride, extend pavement life, and reduce maintenance costs. The 15-year HMA mill and overlay alternative was selected for having the lowest Project Net Present Cost.

2. If the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected:

The 15-year HMA mill and overlay alternative was selected for having the lowest Project Net Present Cost

3. Include all questions and comments received during the review period and the commissioner's responses to each:

This project was not reviewed by Minnesota Asphalt Pavement Association (MAPA) or Concrete Paving Association of Minnesota (CPAM). The letting date for this project was March 26, 2025.

Document of Justification for 5080-179 TH 90 WB

This document of justification is to meet the requirements of 2024 Minnesota Statute 174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

1. Why the pavement strategy was selected:

Three rehabilitation alternatives were considered and two of them had equal design lives as required by Minnesota Statute 174.185. The district wanted a medium-term rehabilitation alternative that would improve ride, preserve existing roadway structure, extend pavement life, and reduce maintenance costs. District budget constraints in the initial design year due to maintaining the district roadway network system made doing a 20-year life or greater rehabilitation cost prohibitive. The district previously implemented 15-year rehabilitation alternates on TH 90 WB and UBOL on TH 90 EB. The district would eventually replace the 15-year rehabilitations with UBOL on TH 90 WB, when the TH 90 EB is completed. The 15-year HMA overlay alternative was selected for having the lowest Project Net Present Cost.

2. If the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected:

The 15-year HMA overlay alternative had the lowest Project Net Present Cost out of three rehabilitation alternates that were considered.

3. Include all questions and comments received during the review period and the commissioner's responses to each:

Since this is a district LCCA, it was not reviewed by Minnesota Asphalt Pavement Association (MAPA) and Concrete Paving Association of Minnesota (CPAM).

Document of Justification for 5502-106 TH 14 Rochester

This document of justification is to meet the requirements of 2024 Minnesota Statute 174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

1. Why the pavement strategy was selected:

Three rehabilitation alternatives were considered and two of them had equal design lives as required by Minnesota Statute 174.185. The district wanted a medium-term rehabilitation alternative that would improve ride, preserve existing roadway structure, extend pavement life, improve geometrics, and reduce maintenance costs.

District budget constraints during the initial design year limited available funding. In addition, existing infrastructure such as concrete curb and gutter, storm sewer, center medians, original concrete pavement, and City utilities dating back to the 1930s would significantly increase costs. These factors made a full 20-year rehabilitation cost prohibitive. The 15-year HMA mill and overlay alternative was selected for having the lowest Project Net Present Cost.

2. If the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected:

The 15-year HMA mill and overlay alternative had the lowest Project Net Present Cost out of three rehabilitation alternates that were considered.

3. Include all questions and comments received during the review period and the commissioner's responses to each:

Since this is a district LCCA, it was not reviewed by Minnesota Asphalt Pavement Association (MAPA) and Concrete Paving Association of Minnesota (CPAM).

Document of Justification for 5604-09 TH 210

This document of justification is to meet the requirements of 2024 Minnesota Statute 174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

1. Why the pavement strategy was selected:

Three rehabilitation alternatives were considered and two of them had equal design lives as required by Minnesota Statute 174.185. The district wanted a medium-term rehabilitation alternative that would improve ride, extend pavement life, and reduce maintenance costs. The 15-year HMA mill and overlay alternative was selected for having the lowest Project Net Present Cost.

2. If the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected:

The 15-year HMA mill and overlay alternative was selected for having the lowest Project Net Present Cost

3. Include all questions and comments received during the review period and the commissioner's responses to each:

This project was not reviewed by Minnesota Asphalt Pavement Association (MAPA) or Concrete Paving Association of Minnesota (CPAM). The letting date for this project was February 26, 2025.

Document of Justification for 5680-147 TH 94

This document of justification is to meet the requirements of 2024 Minnesota Statute 174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

1. Why the pavement strategy was selected:

Three rehabilitation alternatives were considered and two of them had equal design lives as required by Minnesota Statute 174.185. The district wanted a long-term rehabilitation alternative that would improve ride, extend pavement life, and reduce maintenance costs. The 35-year PCC UBOL alternative was selected for having the lowest Project Net Present Cost.

2. If the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected:

The 35-year PCC UBOL alternative was selected for having the lowest Project Net Present Cost.

3. Include all questions and comments received during the review period and the commissioner's responses to each:

This project was not reviewed by Minnesota Asphalt Pavement Association (MAPA) or Concrete Paving Association of Minnesota (CPAM). The letting date for this project was January 29, 2025.

Document of Justification for 6102-25 TH 28

This document of justification is to meet the requirements of 2024 Minnesota Statute 174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

1. Why the pavement strategy was selected:

Three rehabilitation alternatives were considered and two of them had equal design lives as required by Minnesota Statute 174.185. The district wanted a long-term rehabilitation alternative that would improve ride, extend pavement life, and reduce maintenance costs. The 20-year HMA FDR and overlay alternative was selected for having the lowest Project Net Present Cost.

2. If the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected:

The 20-year HMA FDR and overlay alternative was selected for having the lowest Project Net Present Cost.

3. Include all questions and comments received during the review period and the commissioner's responses to each:

This project LCCA was placed on the MnDOT Pavement Design Unit website on 6/30/25 for review and comment. No comments from were received from Minnesota Asphalt Pavement Association (MAPA) or Concrete Paving Association of Minnesota (CPAM).

Document of Justification for 6803-43 TH 11

This document of justification is to meet the requirements of 2024 Minnesota Statute 174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

1. Why the pavement strategy was selected:

Three rehabilitation alternatives were considered and two of them had equal design lives as required by Minnesota Statute 174.185. The district wanted a long-term rehabilitation alternative that would improve ride, preserve existing roadway structure, and reduce maintenance costs. The 20-year HMA FDR alternative was selected for having the lowest Project Net Present Cost.

2. If the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected:

The 20-year HMA FDR alternative was selected for having the lowest Project Net Present Cost.

3. Include all questions and comments received during the review period and the commissioner's responses to each:

This project LCCA was placed on the MnDOT Pavement Design Unit website on 6/30/25 for review and comment. No comments from were received from Minnesota Asphalt Pavement Association (MAPA).

Formstack Submission For: [LCCA Comments](#)

Submitted at 07/08/25 9:27 AM

Name:	Dan Labo
Organization:	Concrete Paving Association of Minnesota
Email:	djlabo@cpamn.com
MnDOT District:	District 2 - Northwest Minnesota
SP Number:	6803-43

- Comments:
- The two concrete options are identical in design, yet have different net present values for each design (20 and 35-year respectively). It greatly reduces MnDOT's credibility when it effectively says, "The concrete designs are identical, but the 20-year design will have more maintenance because the pavement manual says it does." This systemic absurdity needs to be corrected as soon as possible.
 - A true 20-year concrete design was not performed, and per my calculations would be 4.5". This type of design is required by statute, and was not performed.
 - A true 35-year concrete design was not performed, and per my calculations, would be 5". Modifying the 35-year design to a 5" pavement, changed the NPV from \$25.5 million to \$17.9 million. This over-design of concrete specified resulted in a \$7.5 million being added to the concrete option considered; which is a massive penalty applied to concrete in the LCCA. Does MnDOT believe concrete should be penalized in dozens of LCCA's by including excessive design thicknesses for concrete, but not for asphalt?
 - While I assume the district intends to select the bituminous design (Option #1), the District has not included a "draft pavement selection" clearly stating its intentions as mandated by Minnesota law. Please upload this file and reset the 21-day review time to comply with statute. This document needs to be in all industry review packages effective 7/1/2025.
 - FYI: In your 7" concrete designs, a non-widened lane will achieve the design lives specified, achieving significant cost savings. Any time your concrete thickness output is 7" in the current MnPAVE, you are almost likely grossly overdesigned.
 - FYI: Rounding the pavement thickness up to 7" for all concrete designs represents a systemic bias against concrete. This issue is under active discussion with the MnDOT pavement office.
 - FYI: While I don't believe this is a good alternative bid candidate (mostly due to location of the project), nor will it likely be within 10% had proper concrete designs been performed, the District could easily produce plans with different pavement

options here: pavement A (bit 5") and pavement B (concrete 5"); making this an incredibly easy job to alternate bid. MnDOT continually avoids alternative bids because they're "too difficult", and this example shows that in many instances, it's frequently not that hard when proper concrete designs are produced.

Document of Justification for 6918-103 TH 53

This document of justification is to meet the requirements of 2024 Minnesota Statute 174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

1. Why the pavement strategy was selected:

Three rehabilitation alternatives were considered and two of them had equal design lives as required by Minnesota Statute 174.185. The district wanted a long-term rehabilitation alternative that would improve ride, eliminate medium severity transverse and longitudinal cracking, and decrease maintenance costs. The 35-year UBOL alternative was selected for having the lowest Project Net Present Cost.

2. If the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected:

The 35-year UBOL alternative had the lowest Project Net Present Cost out of three rehabilitation alternates that were considered.

3. Include all questions and comments received during the review period and the commissioner's responses to each:

The LCCA was posted on the Pavement Design website on October 9, 2024, and no comments were received by Concrete Paving Association of Minnesota (CPAM). The comments received from Minnesota Asphalt Pavement Association (MAPA) are below:

Comment from Brandon Brever, Minnesota Asphalt Pavement Association, bbrever@mnapa.org, 10/31/2024

Life Cycle Value of HMA:

New HMA pavement (Alternate #3) can offer better long-term performance and durability than rehabilitation options, as it provides a new pavement structure. This can result in fewer required interventions and lower maintenance costs over time, especially beneficial on a heavily trafficked route. HMA can reduce the frequency of maintenance activities compared to shorter-cycle alternatives, minimizing traffic disruptions and long-term costs.

Long-Term Performance and Reduced User Costs:

Asphalt pavements are known for their smoothness and ability to reduce wear and tear on vehicles, lowering user costs. A new HMA (Alternate #3) provides an excellent balance of cost, durability, and user benefits, making it an ideal choice for projects where user experience and reduced maintenance costs are priorities.

Environmental Benefits:

HMA pavements are compatible with high recycled content (100% of asphalt pavements are recycled), contributing to sustainability goals. Utilizing RAP (Recycled Asphalt Pavement) aligns with

environmental objectives by reducing the demand for virgin materials and lowering carbon emissions associated with production.

Flexible Maintenance Options:

Asphalt pavements provide a range of flexible maintenance options that can be implemented quickly, such as overlays and surface treatments, ensuring that road performance remains optimal over time.

This flexibility allows for quick and cost-effective repairs, which is particularly advantageous for high-use roads where minimizing downtime is essential.

Resilience and Adaptability:

With climate resilience becoming a significant consideration, asphalt's adaptability to various weather conditions and potential for innovative additives (e.g., warm-mix asphalt technology) make it a forward-looking choice.

The choice of HMA could align well with future requirements to adjust to evolving climate conditions or state and federal funding priorities that prioritize resilient infrastructure.

Considering these comments, New HMA (Alternate #3) is a cost-effective, sustainable, and resilient pavement option, supporting both immediate and long-term project goals.

MnDOT Response:

Pavement Design Engineer responses 12/2/2024

"A new HMA (Alternate #3) provides an excellent balance of cost, durability, and user benefits, making it an ideal choice for projects where user experience and reduced maintenance costs are priorities."

Response: This project was originally scoped as a mill and overlay, specifically to remove and replace all the HMA over the concrete. However, the District wanted a longer life for this project. Exploring options, the Unbonded Concrete Overlay and a bituminous regrade were considered. The profile increase resulting from an UBOL fit well with the need to raise grades because the bridge replacements over TH 37 needed increased clearance. Raising the grade of US 53 near Hat Trick Avenue allowed less slope on the connecting side streets. The LCCA analysis of the two options resulted in UBOL being the low-cost alternative.

"Considering these comments, New HMA (Alternate #3) is a cost-effective, sustainable, and resilient pavement option, supporting both immediate and long-term project goals."

Response: The project does have a bituminous component with wide bituminous shoulders as well as numerous side road connections at Progress Parkway, Hat Trick Avenue, and Bourgin Road as well as Multi-use Trail connections will be bituminous. Some of these were built in 2024 (about \$250,000 worth) and more are included with the rest project, letting in January 2025.

Document of Justification for 6930-41 TH 73

This document of justification is to meet the requirements of 2024 Minnesota Statute 174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

1. Why the pavement strategy was selected:

Three rehabilitation alternatives were considered and two of them had equal design lives as required by Minnesota Statute 174.185. The district wanted a long-term rehabilitation alternative that would improve ride, eliminate high severity transverse cracking, eliminate medium severity longitudinal cracking, eliminate, patching, and decrease maintenance costs.

The 20-year HMA FDR with overlay alternative was selected for having the lowest Project Net Present Cost and for uniformity for snow and ice control. The roadway at both ends of this project consist of HMA pavement.

2. If the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected:

The 20-year HMA FDR with Overlay alternative had the lowest Project Net Present Cost out of three rehabilitation alternates that were considered.

3. Include all questions and comments received during the review period and the commissioner's responses to each:

The LCCA was posted on the Pavement Design website on October 1, 2024, and no comments were received by Minnesota Asphalt Pavement Association (MAPA) and Concrete Paving Association of Minnesota (CPAM).

Document of Justification for 8201-21 TH 97

This document of justification is to meet the requirements of 2024 Minnesota Statute 174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

1. Why the pavement strategy was selected:

Three rehabilitation alternatives were considered and two of them had equal design lives as required by Minnesota Statute 174.185. The district wanted a long-term rehabilitation alternative that would improve ride, extend pavement life, and reduce maintenance costs. The 20-year HMA reconstruct alternative was selected for having the lowest Project Net Present Cost.

2. If the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected:

The 20-year HMA reconstruct alternative was selected for having the lowest Project Net Present Cost.

3. Include all questions and comments received during the review period and the commissioner's responses to each:

This project was not reviewed by Minnesota Asphalt Pavement Association (MAPA) or Concrete Paving Association of Minnesota (CPAM). The letting date for this project was April 02, 2025.

Document of Justification for 8580-175 TH 90

This document of justification is to meet the requirements of 2024 Minnesota Statute 174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

1. Why the pavement strategy was selected:

Three rehabilitation alternatives were considered and two of them had equal design lives as required by Minnesota Statute 174.185. The district wanted a medium-term rehabilitation alternative that would improve ride, preserve existing roadway structure, and reduce maintenance costs. The 15-year HMA mill and overlay alternative was selected for having the lowest Project Net Present Cost.

2. If the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected:

The 15-year HMA mill and overlay alternative had the lowest Project Net Present Cost out of three rehabilitation alternates that were considered.

3. Include all questions and comments received during the review period and the commissioner's responses to each:

This project LCCA was placed on the MnDOT Pavement Design Unit website on 3/17/25 for review and comment. No comments from were received from Minnesota Asphalt Pavement Association (MAPA) or Concrete Paving Association of Minnesota (CPAM).

Document of Justification for 8580-178 TH 90 WB

This document of justification is to meet the requirements of 2024 Minnesota Statute 174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

1. Why the pavement strategy was selected:

Three rehabilitation alternatives were considered and two of them had equal design lives as required by Minnesota Statute 174.185. The district wanted a medium-term rehabilitation alternative that would improve ride, preserve existing roadway structure, extend pavement life, and reduce maintenance costs. The district budget constraints in the initial design year due to maintaining the district roadway network system made doing a 20-year life or greater rehabilitation cost prohibitive. The 15-year HMA mill and overlay alternative was selected for having the lowest Project Net Present Cost.

2. If the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected:

The 15-year HMA mill and overlay alternative had the lowest Project Net Present Cost out of three rehabilitation alternates that were considered.

3. Include all questions and comments received during the review period and the commissioner's responses to each:

This project LCCA was placed on the MnDOT Pavement Design Unit website on 3/17/25 for review and comment. No comments from were received from Minnesota Asphalt Pavement Association (MAPA) or Concrete Paving Association of Minnesota (CPAM).

Document of Justification for 8580-179 TH 90 WB

This document of justification is to meet the requirements of 2024 Minnesota Statute 174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.

1. Why the pavement strategy was selected:

Three rehabilitation alternatives were considered and two of them had equal design lives as required by Minnesota Statute 174.185. The district wanted a medium-term rehabilitation alternative that would improve ride, extend pavement life, and reduce maintenance costs. The 15-year HMA mill and overlay alternative was selected for having the lowest Project Net Present Cost.

2. If the lowest life-cycle cost is not selected, justify why a strategy with a higher life-cycle cost was selected:

The 15-year HMA mill and overlay alternative was selected for having the lowest Project Net Present Cost.

3. Include all questions and comments received during the review period and the commissioner's responses to each:

This project LCCA was placed on the MnDOT Pavement Design Unit website on 11/10/25 for review and comment. No comments from were received from Minnesota Asphalt Pavement Association (MAPA) or Concrete Paving Association of Minnesota (CPAM).