District	2
Performed By	TA check
Analysis Period	35
Discount Rate	2.5

Project Number	0109-19
Date	
Funding Category	RD
Low Cost Option #	1
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
2" Mill, 8" FDR, 4" HMA Overlay, 4" HMA Shlds					2" Mill, 8" FDR, & 6" PCC w/Dowels, 4" HMA Shlds					2" Mill, 8" FDR, & 3.5" PCC w/o Dowels 3.5" HMA Shlds				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			20	BIT				35	PCC				20	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0				$ 260,957	0				$ 376,004	0				$ 224,161
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3				$ -	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7				$ -	7				$ -	7				$ -
8	BC		Light Crack Treatment	$ 1,500	8				$ -	8				$ -
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12	AB		Surface Treatment	$ 20,000	12				$ -	12				$ -
13				$ -	13				$ -	13	AN		Reseal Joints (6'X6')	$ 180,411
14				$ -	14				$ -	14				$ -
15				$ -	15				$ -	15				$ -
16				$ -	16				$ -	16				$ -
17				$ -	17	AO		Reseal Joints (12')	$ 66,289	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20	BB	15	2" Mill & 3.5" HMA Overlay	$ 218,265	20				$ -	20				$ -
21				$ -	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23	AA		Crack Treatment	$ 3,000	23				$ -	23				$ -
24				$ -	24				$ -	24				$ -
25				$ -	25				$ -	25	BF		Major CPR (6'X6') 20 yr	$ 467,244
26				$ -	26				$ -	26				$ -
27	AB		Surface Treatment	$ 20,000	27	AQ		Minor CPR (12')	$ 212,183	27				$ -
28				$ -	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31				$ -	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34				$ -	34				$ -
35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ (81,609)	35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 422,228				Total Present Worth	$ 494,116				Total Present Worth	$ 607,062
			Eq. Annual Cost*	$18,243				Eq. Annual Cost*	$21,349				Eq. Annual Cost*	$26,228
			% of Low Cost	100%				% of Low Cost	117%				% of Low Cost	144%

This design falls below the minimum pavement thickness and will not be used.

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

District	Metro
Performed By	T. Clyne
Analysis Period	35
Discount Rate	2.5

Project Number	SP 0202-094
Date	12/10/2012
Funding Category	RS
Low Cost Option #	1
Chosen Option #	1

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
2" M&O + UTBWC					9" Whitetopping					FDR + 8" Overlay				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			12	BIT				20	PCC				20	BIT
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0			2" M&O + UTBWC	$ 237,436	0			9" Whitetopping	$ 1,022,711	0			FDR + 8" OL	$ 918,305
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3	AA		Crack Treatment	$ 3,000	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7				$ -	7				$ -	7				$ -
8				$ -	8				$ -	8	BD		Light Crack Treatment	$ 1,500
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12	BA		3.5" M&O	$ 227,844	12				$ -	12	AB		Surface Treatment	$ 33,000
13				$ -	13	AQ		Minor CPR (15')	$ 64,112	13				$ -
14				$ -	14				$ -	14				$ -
15	AA		Crack Treatment	$ 3,000	15				$ -	15				$ -
16				$ -	16				$ -	16				$ -
17				$ -	17				$ -	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20				$ -	20				$ -	20	AK		3" Mill & 3" Overlay	$ 197,811
21				$ -	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23	BB		4" M&O	$ 258,324	23				$ -	23	AA		Crack Treatment	$ 3,000
24				$ -	24				$ -	24				$ -
25				$ -	25	AS		Major CPR (15')	$ 166,075	25				$ -
26	AA		Crack Treatment	$ 3,000	26				$ -	26				$ -
27				$ -	27				$ -	27	AB		Surface Treatment	$ 33,000
28				$ -	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31				$ -	31				$ -
32				$ -	32				$ -	32				$ -
33	BC		Remove & Replace ML&Shld	$ 560,973	33				$ -	33				$ -
34				$ -	34				$ -	34				$ -
35			Remaining Service Life Value**	$ (486,176.93)	35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 603,162				Total Present Worth	$ 1,158,799				Total Present Worth	$ 1,083,434
			Eq. Annual Cost*	$26,060				Eq. Annual Cost*	$50,067				Eq. Annual Cost*	$46,810
			% of Low Cost	100%				% of Low Cost	192%				% of Low Cost	180%

* Equivalent Annual Cost is included for information only.

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

District	4
Performed By	graig
Analysis Period	35
Discount Rate	2.7

Project Number	0305-31
Date	5/2/2012
Funding Category	RD
Low Cost Option #	1
Chosen Option #	

District	4
Performed By	graig
Analysis Period	35
Discount Rate	2.7

OPTION #1

DESCRIPTION	DESIGN LIFE	TYPE
mill 3" and fill 3"	14	BIT

Year	#	Life	Description	Cost/Mile
0			mill 3" and fill 3"	$ 180,000
1				$ -
2				$ -
3				$ -
4				$ -
5	BB		patch	$ 5,000
6				$ -
7				$ -
8				$ -
9				$ -
10	BB		patch	$ 5,000
11				$ -
12				$ -
13				$ -
14	BC		4" mill and fill C oil	$ 250,000
15				$ -
16				$ -
17				$ -
18	AA		Crack Treatment	$ 4,000
19				$ -
20				$ -
21	AB		Surface Treatment	$ 25,000
22				$ -
23				$ -
24				$ -
25				$ -
26	AA		Crack Treatment	$ 4,000
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33	AC		1.5" Overlay	$ 80,000
34				$ -
35			Remaining Service Life Value**	$ 60,000
			Total Present Worth	$ 435,965
			Eq. Annual Cost*	$19,411
			% of Low Cost	100%

OPTION #2

DESCRIPTION	DESIGN LIFE	TYPE
Mill 4" then 2" PASB and 4" C oil	20	BIT

Year	#	Life	Description	Cost/Mile
0			Mill 4" with PASB and OL; "C"	$ 370,000
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7	AB		Surface Treatment	$ 25,000
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	ai		1.5" Mill & 3" Overlay	$ 180,000
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26	BB		patch	$ 5,000
27				$ -
28				$ -
29				$ -
30	BB		patch	$ 5,000
31				$ -
32				$ -
33				$ -
34	AC		1.5" Overlay	$ 80,000
35			Remaining Service Life Value**	$ 70,000
			Total Present Worth	$ 561,032
			Eq. Annual Cost*	$24,979
			% of Low Cost	129%

OPTION #3

DESCRIPTION	DESIGN LIFE	TYPE
unbonded 7"	20	BIT

Year	#	Life	Description	Cost/Mile
0			unbonded 7"	$ 750,000
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15	AO		Reseal Joints (15')	$ 5,000
16				$ -
17				$ -
18				$ -
19				$ -
20	AQ		Minor CPR (15')	$ 200,000
21				$ -
22				$ -
23				$ -
24				$ -
25	as		Major CPR (15')	$ 300,000
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 1,024,861
			Eq. Annual Cost*	$45,631
			% of Low Cost	235%

OPTION #4

DESCRIPTION	DESIGN LIFE	TYPE
whitetopping 6"	20	PCC

Year	#	Life	Description	Cost/Mile
0			whitetopping	$ 450,000
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13	AO		Reseal Joints (15')	$ 5,000
14				$ -
15				$ -
16				$ -
17				$ -
18	AQ		Minor CPR (15')	$ 200,000
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	AS		Major CPR (15')	$ 300,000
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 731,469
			Eq. Annual Cost*	$32,568
			% of Low Cost	168%

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

* Equivalent Annual Cost is included for informatic

District	4
Performed By	SM
Analysis Period	35
Discount Rate	2.7

Project Number	0607-20
Date	11/15/2011
Funding Category	RS
Low Cost Option #	1
Chosen Option #	1

District	4
Performed By	SM
Analysis Period	35
Discount Rate	2.7

OPTION #1

DESCRIPTION: Mill 1.5" and Pave 3" Bituminous Overlay

DESIGN LIFE: 15 **TYPE**: BIT

Year	#	Life	Description	Cost/Mile
0			Initial Cost	$ 134,028
1				$ -
2				$ -
3	AA	3	Crack Treatment	$ 2,000
4				$ -
5				$ -
6	AB	9	Surface Treatment	$ 20,000
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15	AK	14	3" Mill & 3" Overlay	$ 140,000
16				$ -
17				$ -
18	AA	3	Crack Treatment	$ 2,000
19				$ -
20				$ -
21	AB	8	Surface Treatment	$ 20,000
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27				$ -
28				$ -
29	AH	10	2" Mill & 2" Overlay	$ 95,000
30				$ -
31				$ -
32	AA	3	Crack Treatment	$ 2,000
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (38,000)
			Total Present Worth	$ 289,236
			Eq. Annual Cost*	$12,878
			% of Low Cost	100%

OPTION #2

DESCRIPTION: 6" Unbonded Concrete Overlay

DESIGN LIFE: 25 **TYPE**: PCC

Year	#	Life	Description	Cost/Mile
0			Initial Cost	$ 298,781
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	AP	5	Minor CPR (6'X6')	$ 100,000
21				$ -
22				$ -
23				$ -
24				$ -
25	AR	10	Major CPR (6'X6')	$ 200,000
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 460,222
			Eq. Annual Cost*	$20,491
			% of Low Cost	159%

OPTION #3

DESCRIPTION: Bituminous Reconstruct

DESIGN LIFE: 20 **TYPE**: BIT

Year	#	Life	Description	Cost/Mile
0			Initial Cost	$ 355,738
1				$ -
2				$ -
3	AA	3	Crack Treatment	$ 2,000
4				$ -
5				$ -
6	AB	14	Surface Treatment	$ 20,000
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	AK	16	3" Mill & 3" Overlay	$ 140,000
21				$ -
22				$ -
23	AA	3	Crack Treatment	$ 2,000
24				$ -
25				$ -
26	AB	10	Surface Treatment	$ 20,000
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (8,750)
			Total Present Worth	$ 464,445
			Eq. Annual Cost*	$20,679
			% of Low Cost	161%

OPTION #4

DESCRIPTION: 5" Whitetopping

DESIGN LIFE: 20 **TYPE**: PCC

Year	#	Life	Description	Cost/Mile
0			Initial Cost	$ 200,992
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	AR	10	Major CPR (6'X6')	$ 200,000
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27				$ -
28				$ -
29				$ -
30	AZ	20	New Bituminous Structure	$ 356,000
31				$ -
32				$ -
33	AA	3	Crack Treatment	$ 2,000
34				$ -
35			Remaining Service Life Value**	$ (267,000)
			Total Present Worth	$ 374,203
			Eq. Annual Cost*	$16,661
			% of Low Cost	129%

* Equivalent Annual Cost is included for information only.

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

* Equivalent Annual Cost is included for informatic

SP 0912-31

District	1
Performed By	CM/SH
Analysis Period	35
Discount Rate	2.5

Project Number	SP 0912-31
Date	4/8//2013
Funding Category	RC
Low Cost Option #	2
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
12" FDR and 5" Bituminous					1.5" Mill & 3" Overlay					6"x6'x6' PCC Pavement				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			20	BIT				16	BIT				20	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0	BL		12" FDR and 5" Bituminous	$ 136,000	0	AI		1.5" Mill & 3" Overlay	$ 79,000	0	BM		6"x6'x6' PCC Pavement	$ 153,000
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3				$ -	3	AA		Crack Treatment	$ 1,100	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7				$ -	7	AB		Surface Treatment	$ 9,500	7				$ -
8	AA		Crack Treatment	$ 1,100	8				$ -	8				$ -
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12	AB		Surface Treatment	$ 9,500	12				$ -	12				$ -
13				$ -	13				$ -	13	AN		Reseal Joints (6'X6')	$ 59,000
14				$ -	14				$ -	14				$ -
15				$ -	15				$ -	15				$ -
16				$ -	16	BG		2nd 2" Mill & 2" Overlay	$ 55,000	16				$ -
17				$ -	17				$ -	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19	AA		Crack Treatment	$ 1,100	19				$ -
20	AH		2" Mill & 2" Overlay	$ 55,000	20				$ -	20				$ -
21				$ -	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23	AA		Crack Treatment	$ 1,100	23	AB		Surface Treatment	$ 9,500	23				$ -
24				$ -	24				$ -	24				$ -
25				$ -	25				$ -	25	AR		Major CPR (6'X6')	$ 119,000
26				$ -	26				$ -	26				$ -
27	AB		Surface Treatment	$ 9,500	27				$ -	27				$ -
28				$ -	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31	BG		2nd 2" Mill & 2" Overlay	$ 55,000	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34	AA		Crack Treatment	$ 1,100	34				$ -
35	AH	0%	Remaining Service Life Value**	$ -	35	BG	71%	Remaining Service Life Value**	$ (39,050)	35	AR	0%	Remaining Service Life Value**	$ -
			Total Present Worth	$ 183,032				Total Present Worth	$ 140,736				Total Present Worth	$ 259,987
			Eq. Annual Cost*	$7,908				Eq. Annual Cost*	$6,081				Eq. Annual Cost*	$11,233
			% of Low Cost	130%				% of Low Cost	100%				% of Low Cost	185%

* Equivalent Annual Cost is included for information only.

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

SP 0913-17

District	1
Performed By	CM/SH
Analysis Period	35
Discount Rate	2.5

Project Number	SP 0913-17
Date	4/8//2013
Funding Category	RC
Low Cost Option #	2
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
12" FDR and 5" Bituminous					1.5" Mill & 3" Overlay					6"x6'x6' PCC Pavement				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			20	BIT				16	BIT				20	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0	BL		12" FDR and 5" Bituminous	$ 136,000	0	AI		1.5" Mill & 3" Overlay	$ 79,000	0	BM		6"x6'x6' PCC Pavement	$ 153,000
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3				$ -	3	AA		Crack Treatment	$ 1,100	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7				$ -	7	AB		Surface Treatment	$ 9,500	7				$ -
8	AA		Crack Treatment	$ 1,100	8				$ -	8				$ -
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12	AB		Surface Treatment	$ 9,500	12				$ -	12				$ -
13				$ -	13				$ -	13	AN		Reseal Joints (6'X6')	$ 59,000
14				$ -	14				$ -	14				$ -
15				$ -	15				$ -	15				$ -
16				$ -	16	BG		2nd 2" Mill & 2" Overlay	$ 55,000	16				$ -
17				$ -	17				$ -	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19	AA		Crack Treatment	$ 1,100	19				$ -
20	AH		2" Mill & 2" Overlay	$ 55,000	20				$ -	20				$ -
21				$ -	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23	AA		Crack Treatment	$ 1,100	23	AB		Surface Treatment	$ 9,500	23				$ -
24				$ -	24				$ -	24				$ -
25				$ -	25				$ -	25	AR		Major CPR (6'X6')	$ 119,000
26				$ -	26				$ -	26				$ -
27	AB		Surface Treatment	$ 9,500	27				$ -	27				$ -
28				$ -	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31	BG		2nd 2" Mill & 2" Overlay	$ 55,000	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34	AA		Crack Treatment	$ 1,100	34				$ -
35	AH	0%	Remaining Service Life Value**	$ -	35	BG	71%	Remaining Service Life Value**	$ (39,050)	35	AR	0%	Remaining Service Life Value**	$ -
			Total Present Worth	$ 183,032				Total Present Worth	$ 140,736				Total Present Worth	$ 259,987
			Eq. Annual Cost*	$7,908				Eq. Annual Cost*	$6,081				Eq. Annual Cost*	$11,233
			% of Low Cost	130%				% of Low Cost	100%				% of Low Cost	185%

* Equivalent Annual Cost is included for information only.

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

District	8
Performed By	SJP & AAA
Analysis Period	35
Discount Rate	2.5

Project Number	1012-23
Date	1/14/2013
Funding Category	RS
Low Cost Option #	1
Chosen Option #	1

District	8
Performed By	SJP & AAA
Analysis Period	35
Discount Rate	2.5

OPTION #1

DESCRIPTION	DESIGN LIFE	TYPE
4.5" BITUMINOUS OVERLAY	14	BIT

Year	#	Life	Description	Cost/Mile
0	bc		4.5" BIT OL	$ 249,818
1				$ -
2				$ -
3	aa		Crack Treatment	$ 3,000
4				$ -
5				$ -
6				$ -
7	ab		Chip Seal	$ 20,000
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14	bp		2" Mill & 3.5" Overlay	$ 183,203
15				$ -
16				$ -
17	aa		Crack Treatment	$ 3,000
18				$ -
19				$ -
20				$ -
21	ab		Chip Seal	$ 20,000
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	bp		2" Mill & 3.5" Overlay	$ 183,203
28				$ -
29				$ -
30	aa		Crack Treatment	$ 3,000
31				$ -
32				$ -
33				$ -
34	ab		Chip Seal	$ 20,000
35			Remaining Service Life Value**	$ (61,062)
			Total Present Worth	$ 491,361
			Eq. Annual Cost*	$21,230
			% of Low Cost	100%

OPTION #2

DESCRIPTION	DESIGN LIFE	TYPE
6" UBOL + PASSRC	35	PCC

Year	#	Life	Description	Cost/Mile
0	bd		6" UBOL + PASSRC	$ 594,624
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	bj		1st CPR (35 yr dgn)	$ 22,898
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	bk		2nd CPR (35 yr dgn)	$ 145,476
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (55,952)
			Total Present Worth	$ 660,784
			Eq. Annual Cost*	$28,550
			% of Low Cost	134%

OPTION #3

DESCRIPTION	DESIGN LIFE	TYPE
5" UBOL + PASSRC	20	PCC

Year	#	Life	Description	Cost/Mile
0	bf		5" UBOL + PASSRC	$ 508,192
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13	AN		Reseal Joints (6'X6')	$ 45,796
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	AR		Major CPR (6'X6')	$ 378,927
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 745,803
			Eq. Annual Cost*	$32,223
			% of Low Cost	152%

OPTION #4

DESCRIPTION	DESIGN LIFE	TYPE
5.5" BIT Overlay with Ultrathin Bonded Wear Course	20	BIT

Year	#	Life	Description	Cost/Mile
0	be		0	$ 381,299
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8	aa		Crack Treatment	$ 3,000
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	bp		2" Mill & 3.5" Overlay	$ 183,203
21				$ -
22				$ -
23	aa		Crack Treatment	$ 3,000
24				$ -
25				$ -
26				$ -
27	ab		Chip Seal	$ 20,000
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	
			Total Present Worth	$ 507,533
			Eq. Annual Cost*	$21,928
			% of Low Cost	103%

* Equivalent Annual Cost is included for information only.

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

This design falls below the minimum pavement thickness and will not be used.

* Equivalent Annual Cost is included for informatio

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

Project Number	1306-40
Date	11/14/2011
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				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			20	BIT				35	PCC				20	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0			Initial Cost	$ 482,800	0			Initial Cost	$ 491,700	0			Initial Cost	$ 453,700
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3				$ -	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7				$ -	7				$ -	7				$ -
8	BA		Light Crack Treatment	$ 2,500	8				$ -	8				$ -
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12	BB		Chip Seal	$ 20,000	12				$ -	12				$ -
13				$ -	13				$ -	13	BF		1st CPR (20 year)	$ 23,426
14				$ -	14				$ -	14				$ -
15				$ -	15				$ -	15				$ -
16				$ -	16				$ -	16				$ -
17				$ -	17	BD		1st CPR (35 year)	$ 18,640	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20	BC		2.5" Mill and 4" Overlay	$ 189,226	20				$ -	20				$ -
21				$ -	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				$ -	26				$ -	26				$ -
27	BB		Chip Seal	$ 20,000	27	BE		2nd CPR (35 year)	$ 64,463	27				$ -
28				$ -	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31				$ -	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34				$ -	34				$ -
35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ (24,793)	35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 622,862				Total Present Worth	$ 525,191				Total Present Worth	$ 529,087
			Eq. Annual Cost*	$27,732				Eq. Annual Cost*	$23,383				Eq. Annual Cost*	$23,557
			% of Low Cost	119%				% of Low Cost	100%				% of Low Cost	101%

* Equivalent Annual Cost is included for information only.

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

SP 1406-67

District	4
Performed By	SM
Analysis Period	35
Discount Rate	2.7

Project Number	1406-67
Date	5/18/2012
Funding Category	RS
Low Cost Option #	1
Chosen Option #	

OPTION #1					OPTION #2				
DESCRIPTION					DESCRIPTION				
Mill 1.5", Pave 3"(SPWEB340B)					6" Unbonded Concrete Overlay				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			20	BIT				20	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0			Initial Cost	$ 117,689	0			Initial Cost	$ 310,637
1				$ -	1				$ -
2				$ -	2				$ -
3	AA	2	Crack Treatment	$ 2,000	3				$ -
4				$ -	4				$ -
5	AB	15	Surface Treatment	$ 20,000	5				$ -
6				$ -	6				$ -
7				$ -	7				$ -
8				$ -	8				$ -
9				$ -	9				$ -
10				$ -	10				$ -
11				$ -	11				$ -
12				$ -	12				$ -
13				$ -	13				$ -
14				$ -	14				$ -
15				$ -	15				$ -
16				$ -	16				$ -
17				$ -	17				$ -
18				$ -	18				$ -
19				$ -	19				$ -
20	AK	20	3" Mill & 3" Overlay	$ 122,000	20	BA	15	Major CPR and plane	$ 200,000
21				$ -	21				$ -
22				$ -	22				$ -
23	AA	2	Crack Treatment	$ 2,000	23				$ -
24				$ -	24				$ -
25	AB	15	Surface Treatment	$ 20,000	25				$ -
26				$ -	26				$ -
27				$ -	27				$ -
28				$ -	28				$ -
29				$ -	29				$ -
30				$ -	30				$ -
31				$ -	31				$ -
32				$ -	32				$ -
33				$ -	33				$ -
34				$ -	34				$ -
35			Remaining Service Life Value**	$ (30,500)	35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 208,001				Total Present Worth	$ 428,024
			Eq. Annual Cost*	$9,261				Eq. Annual Cost*	$19,057
			% of Low Cost	100%				% of Low Cost	206%

* Equivalent Annual Cost is included for information only.

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

SP 1506-38

Mn/DOT DISTRICT 2 REHABILITATION WORKSHEET

(General Pre-Scoping / Planning Estimate)

SP. 1506-38 **TH** 92

Funding category	**RS**		*Alternate #1*		*Alternate #2*		*Alternate #3*
	Description ---->		3.0" MILL & 3"OVERLAY		5.5" whitetopping		3.0" MILL & 5"OVERLAY
		YR					
First Cost $ / Mile			$154,362		$420,171		$248,717
Rehab Life in Yrs			35		35		35
Interest %			2.70%		2.70%		2.70%
			20 years		**20 years**		**20 years**
		1	$0		$0		$0
		2	$0		$0		$0
		3	$5,000		$0	f	$5,000
		4	$0		$0		$0
		5	$0		$0		$0
		6	$0		$0		$0
		7	$23,000		$0	g	$23,000
		8	$0		$0		$0
		9	$0		$0		$0
		10	$0	H	$97,945		$0
		11	$0		$0		$0
		12	$0		$0	f	$5,000
		13	$0		$0		$0
		14	$0		$0		$0
		15	$80,000		$0		$0
		16	$0		$0		$0
		17	$0		$0		$0
		18	$5,000		$0		$0
		19	$0		$0		$0
		20	$0	I	$271,098	c	$80,000
		21	$0		$0		$0
		22	$23,000		$0		$0
		23	$0		$0	f	$5,000
		24	$0		$0		$0
		25	$0		$0		$0
		26	$0		$0		$0
		27	$105,214		$0	g	$23,000
		28	$0		$0		$0
		29	$0		$0		$0
		30	$0		$0		$0
		31	$5,000		$0		$0
		32	$0	N	$83,160		$0
		33	$0		$0		$0
		34	$0		$0		$0
		35	($49,100)		($72,072)		$0
		36	$0		$0		$0
		37	$0		$0		$0
		38	$0		$0		$0
		39	$0		$0		$0
		40	$0		$0		$0
		41	$0		$0		$0
		42	$0		$0		$0
		43	$0		$0		$0
		44	$0		$0		$0
		45	$0		$0		$0
		46	$0		$0		$0
		47	$0		$0		$0
		48	$0		$0		$0
		49	$0		$0		$0
Total Cost (Present Worth)			$281,716		$661,413		$336,919
Annual Cost (Present Worth)			$12,543		$29,449		$15,001
% Above Low Option			100%		235%		120%

Notes:

2-Lane Highway

Improvements		Cost / mile
A	Reclaim	$287,589
B	1 1/2" Overlay	$60,000
C	1 1/2" Mill & 1 1/2" Overlay	$80,000
D	2" Mill & Overlay	$105,214
E	3" Mill & 3" Overlay	$137,060
F	Route and Seal	$5,000
G	Chip seal	$23,000
H	Joint seal & minor CPR	$97,945
I	Major CPR & w/full depth repair	$271,098
J	Major CPR & griding	
K	Microsurface	$45,500
L	New Concrete	$300,553
M	5.5" mill, conc rehab, 5" new	$425,510
N	2" overlay	$83,160

Alt #1 - 7yrs left of 15 yr fix
Alt #2 - 13 yrs left of 15 yr fix
Alt #3 -o yrs left

SP2004-20

Cost Analysis TH 30 (Hayfield to Stewartville)

Givens:

Length =	18.608	miles		
Width of Road =	24	feet(Conc.)	24 feet(Bit.)	12/02/11-TRM
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.7	%		
Inflation Rate =	0	%		

***Note:** Aggregate and shoulder quantities were not included in each option.
***Note:** Calculations are based on 35 yr. life cycle.

MILL & 3" Bituminous Overlay(15 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	0.50	$131,000.32
PATCH		Ton	100.00	$74,432.00
TACK COAT		GAL	1	$52,400.13
3" SPWEB340B	Wear	TON	50.00	$2,220,455.42
		Total Cost:		**$2,478,288**
		Cost/Mile:		**$133,184**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$133,184	1.000	$133,184	$5,930
Rout & seal	2	$2,000	0.948	$1,896	$84
Chipseal	4	$20,000	0.899	$17,978	$800
Mill & 3" Overlay	17	$133,184	0.636	$84,675	$3,770
Rout & seal	19	$2,000	0.603	$1,206	$54
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 Present Worth:		**$261,014**	$11,621
		Equivalent Annual Cost:		**$11,621**	$11,621

5.5" WHITETOPPING(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	1.12	$293,440.72
Conc Std Width 5.5		SY	7.00	$1,834,004.48
Structural Concrete		CY	71.31	$2,854,180.21
Reinforcement Bars	Epoxy	lb	0.82	$94,908.24
Dowel Bars	Epoxy	each	6.21	$976,214.38
		Total Cost:		**$6,052,748**
		Cost/Mile:		**$325,277**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$325,277	1.000	$325,277	$14,483
Minor CPR	22	$150,000	0.556	$83,472	$3,716
3.5" Bit. Overlay	33	$146,032	0.415	$60,621	$2,699
Salvage Value	35	($126,561)	0.394	-$49,812	-$2,218
		Total Present Worth:		**$419,558**	$18,680
		Equivalent Annual Cost:		**$18,680**	$18,680

RECLAMATION W/ 4" BITUMINOUS(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	1.12	$293,440.72
RECLAMATION		SY	0.88	$230,560.56
Tack Coats		GAL	1.00	$104,800.26
4" SPWEB340C	Wear	TON	50.00	$2,960,607.23
		Total Cost:		**$3,589,409**
		Cost/Mile:		**$192,896**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$192,896	1.000	$192,896	$8,588
Rout & seal	4	$2,000	0.899	$1,798	$80
Chipseal	6	$20,000	0.852	$17,045	$759
Mill & 3" Overlay	22	$133,184	0.556	$74,114	$3,300
Rout & seal	24	$2,000	0.528	$1,055	$47
Chipseal	26	$20,000	0.500	$10,005	$445
Salvage Value	35	($31,337)	0.394	-$12,334	-$549
		Total Present Worth:		**$284,580**	$12,671
		Equivalent Annual Cost:		**$12,671**	$12,671

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 -20 years, whitetopping-20 years.
4. Aggregate and shoulder quantities were not included in each option.
5. Calculations are based on 35 year life cycle.
6. Costs are based upon recent district project costs.
7. No chipseal on the bituminous overlay over whitetopping.

District	4
Performed By	GG & TA
Analysis Period	35
Discount Rate	2.5

Project Number	2101-21
Date	3/7/2013
Funding Category	RD
Low Cost Option #	1
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
3" Mill, 4" CIR, & 3" HMA					5.5" PCC Whitetopping					5.5" Whitetopping				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			20 yrs	BIT				20 yrs	PCC				20 yrs	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0				$ 231,813	0				$ 272,129	0				$ 272,129
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3				$ -	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7				$ -	7				$ -	7				$ -
8	BC		Light Crack Treatment	$ 1,500	8				$ -	8				$ -
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12				$ -	12				$ -	12				$ -
13	AB		Surface Treatment	$ 20,000	13	AN		Reseal Joints (6'X6')	$ 180,411	13				$ -
14				$ -	14				$ -	14				$ -
15				$ -	15				$ -	15				$ -
16				$ -	16				$ -	16				$ -
17				$ -	17				$ -	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20	BB		2" Mill & 3.5" HMA Overlay	$ 191,177	20				$ -	20	AY		Unbonded Concrete Overlay	$ 350,920
21				$ -	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23	AA		Crack Treatment	$ 3,000	23				$ -	23				$ -
24				$ -	24				$ -	24				$ -
25				$ -	25	AR		Major CPR (6'X6')	$ 400,941	25				$ -
26				$ -	26				$ -	26				$ -
27	AB		Surface Treatment	$ 20,000	27				$ -	27				$ -
28				$ -	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31				$ -	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34				$ -	34				$ -
35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ (87,730)
			Total Present Worth	$ 376,190				Total Present Worth	$ 619,267				Total Present Worth	$ 449,319
			Eq. Annual Cost*	$16,254				Eq. Annual Cost*	$26,756				Eq. Annual Cost*	$19,413
			% of Low Cost	100%				% of Low Cost	165%				% of Low Cost	119%

* Equivalent Annual Cost is included for information only.

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

District	6
Performed By	TA check
Analysis Period	35
Discount Rate	2.7

Project Number	2304-48
Date	3/6/2012
Funding Category	RS
Low Cost Option #	2
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
1.5" mill , 5" SFDR, 3.5" HMA (28' wide)					4" mill, 6" FDR, 6" PCC w/dowels (24' wide) 3" HMA x2' shlds					3" mill, 6" FDR, 4.5" PCC w/o dowels (24' wide) 3" HMA x2'shlds				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			20	BIT				35	PCC				20	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0				$ 260,874	0				$ 305,995	0				$234,550
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3				$ -	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7				$ -	7				$ -	7				$ -
8	bk		50% Crack Treatment	$ 2,500	8				$ -	8				$ -
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12	ab		Surface Treatment	$ 20,000	12				$ -	12				$ -
13				$ -	13				$ -	13	bb		1st CPR (20 yr) w/o dowels	$ 83,953
14				$ -	14				$ -	14				$ -
15				$ -	15				$ -	15				$ -
16				$ -	16				$ -	16				$ -
17				$ -	17	bh		1st CPR (35 yr) w dowels	$ 18,641	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20	ba	15	2" Mill & 3.5" Overlay	$ 165,053	20				$ -	20				$ -
21				$ -	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23	aa		Crack Treatment	$ 5,000	23				$ -	23				$ -
24				$ -	24				$ -	24				$ -
25				$ -	25				$ -	25	bc		2nd CPR (20 yr) w/o dowels	$ 232,369
26				$ -	26				$ -	26				$ -
27	ab		Surface Treatment	$ 20,000	27	bi	5	2nd CPR (35 yr) w dowels	$ 106,560	27				$ -
28				$ -	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31				$ -	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34				$ -	34				$ -
35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ (40,984.62)	35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 386,748				Total Present Worth	$ 353,618				Total Present Worth	$ 413,304
			Eq. Annual Cost*	$17,219				Eq. Annual Cost*	$15,744				Eq. Annual Cost*	$18,402
			% of Low Cost	109%				% of Low Cost	100%				% of Low Cost	117%

* Equivalent Annual Cost is included for information only.

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

SP 2304-50

Cost Analysis TH 16 (T.H. 52 to Lanesboro)

Givens:

Length =	5.114	miles		
Width of Road =	24	feet(Conc.)	24 feet(Bit.)	7/20/12-TRM
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.5	%		
Inflation Rate =	0	%		

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

Item	Course	Unit	Price/Unit	Total Cost
2" MILL BITUMINOUS		SY	0.80	$57,604.10
PATCH		Ton	100.00	$20,456.00
TACK COAT		GAL	$1.00	$14,401.02
3.5" SPWEB340B	Wear	TON	55.00	$783,145.69
		Total Cost:		**$875,607**
		Cost/Mile:		**$171,218**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$171,218	1.000	$171,218	$7,398
Rout & seal	2	$2,000	0.952	$1,904	$82
Chipseal	4	$20,000	0.906	$18,119	$783
Mill & 3" Overlay	17	$146,525	0.657	$96,296	$4,161
Rout & seal	19	$2,000	0.626	$1,251	$54
Chipseal	21	$20,000	0.595	$11,908	$514
Mill & 3" Overlay	33	$146,525	0.443	$64,867	$2,803
Remaining Life Value	35	($126,988)	0.421	-$53,509	-$2,312
	Total Present Worth:			**$312,052**	$13,482
	Equivalent Annual Cost:			**$13,482**	$13,482

5" Whitetopping (20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	1.25	$90,006.40
Conc Std Width 5		SY	5.00	$360,025.60
Structural Concrete		CY	68.50	$685,103.52
Reinforcement Bars	Epoxy	lb	0.80	$25,447.26
		Total Cost:		**$1,160,583**
		Cost/Mile:		**$226,942**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$226,942	1.000	$226,942	$9,805
Minor CPR	20	$150,000	0.610	$91,541	$3,955
Remaining Life Value	35	$0	0.421	$0	$0
	Total Present Worth:			**$318,483**	$13,760
	Equivalent Annual Cost:			**$13,760**	$13,760

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

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	1.25	$90,006.40
PATCH		Ton	100.00	$20,456.00
TACK COAT		GAL	$1.00	$14,401.02
4.5" SPWEB340B	Wear	TON	55.00	$1,006,901.60
		Total Cost:		**$1,131,765**
		Cost/Mile:		**$221,307**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$221,307	1.000	$221,307	$9,562
Rout & seal	3	$2,000	0.929	$1,857	$80
Chipseal	5	$20,000	0.884	$17,677	$764
Mill & 3" Overlay	22	$146,525	0.581	$85,111	$3,677
Rout & seal	24	$2,000	0.553	$1,106	$48
Chipseal	26	$20,000	0.526	$10,525	$455
Remaining Life Value	35	($34,477)	0.421	-$14,528	-$628
	Total Present Worth:			**$323,055**	$13,958
	Equivalent Annual Cost:			**$13,958**	$13,958

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

SP 2308-26

Cost Analysis / T.H. 44 From T.H. 52 to Spring Grove

Givens:

Length =	12.654	miles		
Width of Road =	24	feet(Conc.)	24 feet(Bit.)	8/16/12-TRM
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.5	%		
Inflation Rate =	0	%		

MILL & 3" Bituminous Overlay(15 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	0.50	$89,084.16
PATCH		Ton	100.00	$50,616.00
TACK COAT		GAL	$1.00	$35,633.66
3" SPWEB340B	Wear	TON	55.00	$1,660,974.16
		Total Cost:		**$1,836,308**
		Cost/Mile:		**$145,117**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$145,117	1.000	$145,117	$6,270
Rout & seal	2	$2,000	0.952	$1,904	$82
Chipseal	4	$20,000	0.906	$18,119	$783
Mill & 3" Overlay	17	$145,117	0.657	$95,370	$4,121
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 Present Worth:		**$284,917**	$12,310
		Equivalent Annual Cost:		**$12,310**	$12,310

6" Unbonded Overlay(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
6" MILL BITUMINOUS		SY	3.00	$534,504.96
PASSRC		Ton	58.54	$739,283.63
Conc Std Width 6		SY	5.00	$890,841.60
Structural Concrete		CY	65.77	$1,953,021.73
Reinforcement Bars	Epoxy	lb	0.80	$62,966.30
Dowel Bars	Epoxy	each	5.20	$555,885.16
		Total Cost:		**$4,736,503**
		Cost/Mile:		**$374,309**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$374,309	1.000	$374,309	$16,172
Major CPR	20	$150,000	0.610	$91,541	$3,955
3.5" Bit. Overlay	30	$166,994	0.477	$79,613	$3,440
Rout & seal	32	$2,000	0.454	$908	$39
Remaining Life Value	35	($111,329)	0.421	-$46,911	-$2,027
		Total Present Worth:		**$499,459**	$21,579
		Equivalent Annual Cost:		**$21,579**	$21,579

MILL 1.5" & 4.5" Bituminous Overlay(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	0.50	$89,084.16
PATCH		Ton	100.00	$50,616.00
TACK COAT		GAL	$1.00	$35,633.66
4.5" SPWEB340B	Wear	TON	55.00	$2,491,461.24
		Total Cost:		**$2,666,795**
		Cost/Mile:		**$210,747**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$210,747	1.000	$210,747	$9,105
Rout & seal	3	$2,000	0.929	$1,857	$80
Chipseal	5	$20,000	0.884	$17,677	$764
Mill & 3" Overlay	22	$145,117	0.581	$84,293	$3,642
Rout & seal	24	$2,000	0.553	$1,106	$48
Chipseal	26	$20,000	0.526	$10,525	$455
Remaining Life Value	35	($34,145)	0.421	-$14,388	-$622
		Total Present Worth:		**$311,817**	$13,472
		Equivalent Annual Cost:		**$13,472**	$13,472

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

SP 2309-29

Cost Analysis/ TH 52 From Iowa/MN SL to CSAH 22

Givens:

Length =	9.957	miles		
Width of Road =	24	feet(Conc.)	24 feet(Bit.)	7/12/13-TRM
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.5	%		
Inflation Rate =	0	%		

MILL 1.5" & 3" min. Bituminous Overlay (15 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	0.80	$112,155.65
PATCH		Ton	100.00	$39,828.00
TACK COAT		GAL	$1.00	$28,038.91
3" SPWEB340B	Wear	TON	55.00	$1,306,963.79
		Total Cost:		**$1,486,986**
		Cost/Mile:		**$149,341**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$149,341	1.000	$149,341	$6,452
Rout & seal	2	$5,000	0.952	$4,759	$206
Chipseal	4	$25,000	0.906	$22,649	$979
Mill & 3" Overlay	17	$146,525	0.657	$96,296	$4,161
Rout & seal	19	$5,000	0.626	$3,128	$135
Chipseal	21	$25,000	0.595	$14,885	$643
Mill & 3" Overlay	33	$146,525	0.443	$64,867	$2,803
Remaining Life Value	35	($126,988)	0.421	-$53,509	-$2,312
	Total Present Worth:			**$302,414**	$13,066
	Equivalent Annual Cost:			**$13,066**	$13,066

6" Whitetopping (20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
4" MILL BITUMINOUS		SY	1.75	$245,340.48
Conc Std Width 6		SY	5.00	$700,972.80
Structural Concrete		CY	68.50	$1,600,554.56
Dowel Bars	Epoxy	each	8.19	$688,916.07
Reinforcement Bars	Epoxy	lb	0.80	$49,546.03
		Total Cost:		**$3,285,330**
		Cost/Mile:		**$329,952**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$329,952	1.000	$329,952	$14,256
Reseal	13	$55,000	0.725	$39,898	$1,724
Major CPR	25	$250,000	0.539	$134,848	$5,826
Remaining Life Value	35	$0	0.421	$0	$0
	Total Present Worth:			**$504,698**	$21,806
	Equivalent Annual Cost:			**$21,806**	$21,806

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

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	1.25	$175,243.20
PATCH		Ton	100.00	$0.00
TACK COAT		GAL	$1.00	$42,058.37
4.5" SPWEB340B	Wear	TON	55.00	$1,960,445.68
		Total Cost:		**$2,177,747**
		Cost/Mile:		**$218,715**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$218,715	1.000	$218,715	$9,450
Rout & seal	2	$5,000	0.952	$4,759	$206
Chipseal	4	$25,000	0.906	$22,649	$979
Mill & 3" Overlay	22	$146,525	0.581	$85,111	$3,677
Rout & seal	24	$5,000	0.553	$2,764	$119
Chipseal	26	$25,000	0.526	$13,156	$568
Remaining Life Value	35	($34,477)	0.421	-$14,528	-$628
	Total Present Worth:			**$332,627**	$14,371
	Equivalent Annual Cost:			**$14,371**	$14,371

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

SP 2315-15

Cost Analysis T.H. 16 From Grant St (Spring Valley) to T.H. 52

Givens:

Length =	15.475	miles		
Width of Road =	24	feet(Conc.)	24 feet(Bit.)	12/20/11-TRM
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.7	%		
Inflation Rate =	0	%		

MILL & 3" Bituminous Overlay(15 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	0.50	$108,944.00
PATCH		Ton	100.00	$61,900.00
TACK COAT		GAL	$1.00	$43,577.60
3" SPWEB340B	Wear	TON	50.00	$1,846,600.80
		Total Cost:		**$2,061,022**
		Cost/Mile:		**$133,184**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$133,184	1.000	$133,184	$5,930
Rout & seal	2	$2,000	0.948	$1,896	$84
Chipseal	4	$20,000	0.899	$17,978	$800
Mill & 3" Overlay	17	$133,184	0.636	$84,675	$3,770
Rout & seal	19	$2,000	0.603	$1,206	$54
Chipseal	21	$20,000	0.572	$11,430	$509
Mill & 3" Overlay	33	$133,184	0.415	$55,288	$2,462
Remaining Life Value	35	($115,426)	0.394	-$45,430	-$2,023
	Total Present Worth:			**$260,227**	$11,586
	Equivalent Annual Cost:			**$11,586**	$11,586

6" Unbonded Overlay(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
6.5" MILL BITUMINOUS		SY	3.00	$653,664.00
PASSRC		Ton	58.54	$904,094.69
Conc Std Width 6		SY	5.00	$1,089,440.00
Structural Concrete		CY	65.77	$2,388,415.63
Reinforcement Bars	Epoxy	lb	0.80	$77,003.60
Dowel Bars	Epoxy	each	5.20	$679,810.56
		Total Cost:		**$5,792,428**
		Cost/Mile:		**$374,309**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$374,309	1.000	$374,309	$16,666
Major CPR	20	$150,000	0.587	$88,040	$3,920
3.5" Bit. Overlay	30	$155,536	0.450	$69,939	$3,114
Rout & seal	32	$2,000	0.426	$853	$38
Remaining Life Value	35	($103,691)	0.394	-$40,811	-$1,817
	Total Present Worth:			**$492,330**	$21,920
	Equivalent Annual Cost:			**$21,920**	$21,920

MILL 1.5" & 5" Bituminous Overlay(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	0.50	$108,944.00
PATCH		Ton	100.00	$61,900.00
TACK COAT		GAL	$1.00	$43,577.60
5" SPWEB340B	Wear	TON	50.00	$3,077,668.00
		Total Cost:		**$3,292,090**
		Cost/Mile:		**$212,736**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$212,736	1.000	$212,736	$9,472
Rout & seal	3	$2,000	0.923	$1,846	$82
Chipseal	5	$20,000	0.875	$17,506	$779
Mill & 3" Overlay	22	$133,184	0.556	$74,114	$3,300
Rout & seal	24	$2,000	0.528	$1,055	$47
Chipseal	26	$20,000	0.500	$10,005	$445
Remaining Life Value	35	($31,337)	0.394	-$12,334	-$549
	Total Present Worth:			**$304,928**	$13,577
	Equivalent Annual Cost:			**$13,577**	$13,577

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

SP 2406-47

LIFE CYCLE COST ANALYSIS TH 69 (IOWA/MN SL to T.H. 13)

Givens:

Length =	13.042	miles		
Width of Road =	28	feet	28 feet	trm-6/18/12
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.7	%		
Inflation Rate =	0	%		

***Note:** Aggregate and shoulder quantities were not included in each option.

***Note:** Calculations are based on 35 yr. life cycle.

MILL 2"& 3.5" Bituminous Overlay (15 years)

Item	Course	Unit	Price/Unit	Total Cost
2" MILL BITUMINOUS		SY	0.80	$171,389.27
PATCH		TON	100.00	$52,168.00
TACK COAT		GAL	1.00	$42,847.32
1.5" SPWEB340B	Wear	TON	55.00	$998,610.29
2" SPWEB340B	Wear	TON	55.00	$1,331,480.39
		Total Cost:		**$2,596,495**
		Cost/Mile:		**$199,087**

Strategy	Year	Cost/Mile	Present Worth	Annual Cost
Initial Cost	0	$199,087	$199,087	$8,864
Rout & seal	2	$2,000	$1,896	$84
Chipseal	4	$20,000	$17,978	$800
Mill & 3" Overlay	17	$170,279	$108,259	$4,820
Rout & seal	19	$2,000	$1,206	$54
Chipseal	21	$20,000	$11,430	$509
Mill & 3" Overlay	33	$170,279	$70,686	$3,147
Remaining Life Value	35	($147,575)	-$58,083	-$2,586
		Total Present Worth:	**$352,460**	$15,693
		Equivalent Annual Cost:	**$15,693**	

6" Unbonded Concrete Overlay-Doweled (20 years)

Item	Course	Unit	Price/Unit	Total Cost
4" MILL BITUMINOUS		SY	1.60	$342,778.54
PASSRC		Ton	44.57	$1,245,464.08
Conc Std Width 6		SY	3.35	$717,692.57
Structural Concrete		CY	75.17	$2,684,027.37
Reinforcement Bars	Epoxy	lb	0.86	$149,777.60
Dowel Bars	Epoxy	each	8.19	$902,364.50
		Total Cost:		**$6,042,105**
		Cost/Mile:		**$463,281**

Strategy	Year	Cost/Mile	Present Worth	Annual Cost
Initial Cost	0	$463,281	$463,281	$20,627
Minor CPR	20	$150,000	$88,040	$3,920
Remaining Life Value	35	$0	$0	$0
		Total Present Worth:	**$551,321**	$24,547
		Equivalent Annual Cost:	**$24,547**	$24,547

MILL & 4.5" Bituminous Overlay (20 years)

Item	Course	Unit	Price/Unit	Total Cost
2" MILL BITUMINOUS		SY	0.80	$171,389.27
PATCH		Ton	100.00	$52,168.00
TACK COAT		GAL	1.00	$64,270.98
4.5" SPWEB340B	Wear	TON	55.00	$2,995,830.87
		Total Cost:		**$3,283,659**
		Cost/Mile:		**$251,776**

Strategy	Year	Cost/Mile	Present Worth	Annual Cost
Initial Cost	0	$251,776	$251,776	$11,210
Rout & seal	2	$2,000	$1,896	$84
Chipseal	4	$20,000	$17,978	$800
Mill & 3" Overlay	22	$170,279	$94,757	$4,219
Rout & seal	24	$2,000	$1,055	$47
Chipseal	26	$20,000	$10,005	$445
Remaining Life Value	35	($40,066)	-$15,769	-$702
		Total Present Worth:	**$361,698**	$16,104
		Equivalent Annual Cost:	**$16,104**	$16,104

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, , thick unbonded-30 years,thin 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.

SP 2501-08

Cost Analysis/ T.H. 19 From E. End Br # 66509 to T.H. 20 (Cannon Falls)

Givens:

Length =	13.563	miles		
Width of Road =	27	feet(Conc.)	24 feet(Bit.)	12/2/11-TRM
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.7	%		
Inflation Rate =	0	%		

1.5" MILL & 3" Bituminous Overlay (15 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	$0.50	$95,483.52
PATCH		Ton	$100.00	$54,252.00
TACK COAT		GAL	$1.00	$38,193.41
3" SPWEB340B	Wear	TON	$50.00	$1,618,445.66
		Total Cost:		**$1,806,375**
		Cost/Mile:		**$133,184**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$133,184	1.000	$133,184	$5,930
Rout & seal	2	$2,000	0.948	$1,896	$84
Chipseal	4	$20,000	0.899	$17,978	$800
Mill & 3" Overlay	17	$133,184	0.636	$84,675	$3,770
Rout & seal	19	$2,000	0.603	$1,206	$54
Chipseal	21	$20,000	0.572	$11,430	$509
Mill & 3" Overlay	33	$133,184	0.415	$55,288	$2,462
Remaining Life Value	35	($115,426)	0.394	-$45,430	-$2,023
	Total Present Worth:			**$260,227**	$11,586
	Equivalent Annual Cost:			**$11,586**	$11,586

6" WHITETOPPING-doweled (20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	$1.12	$240,618.47
Conc Std Width 6		SY	$5.00	$1,074,189.60
Structural Concrete		CY	$65.77	$2,354,981.67
Reinforcement Bars	Epoxy	lb	$0.80	$67,489.49
Dowel Bars	Epoxy	each	$5.20	$595,817.16
		Total Cost:		**$4,333,096**
		Cost/Mile:		**$319,479**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$319,479	1.000	$319,479	$14,224
Major CPR	20	$150,000	0.587	$88,040	$3,920
3.5" Bit. Overlay	30	$146,032	0.450	$65,665	$2,924
Rout & seal	32	$2,000	0.426	$853	$38
Remaining Life Value	35	($97,355)	0.394	-$38,317	-$1,706
	Total Present Worth:			**$435,720**	$19,400
	Equivalent Annual Cost:			**$19,400**	$19,400

MILL & 4.5" Bituminous Overlay (20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	$0.50	$95,483.52
PATCH		Ton	$100.00	$54,252.00
TACK COAT		GAL	$1.00	$57,290.11
4.5" SPWEB340B	Wear	TON	$50.00	$2,427,668.50
		Total Cost:		**$2,634,694**
		Cost/Mile:		**$194,256**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$194,256	1.000	$194,256	$8,649
Rout & seal	2	$2,000	0.948	$1,896	$84
Chipseal	4	$20,000	0.899	$17,978	$800
Mill & 3" Overlay	22	$133,184	0.556	$74,114	$3,300
Rout & seal	24	$2,000	0.528	$1,055	$47
Chipseal	26	$20,000	0.500	$10,005	$445
Remaining Life Value	35	($31,337)	0.394	-$12,334	-$549
	Total Present Worth:			**$286,971**	$12,777
	Equivalent Annual Cost:			**$12,777**	$12,777

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 -20 years, whitetopping-20 years.
4. Aggregate and shoulder quantities were not included in each option.
5. Calculations are based on 35 year life cycle.
6. Costs are based upon recent district project costs.
7. No chipseal on the bituminous overlay over whitetopping.

SP 2506-68

Cost Analysis T.H. 52 In Cannon Falls

Givens:

Length =	5.134	miles		
Width of Road =	24	feet(Conc.)	24 feet(Bit.)	8/29/12-TRM
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.5	%		
Inflation Rate =	0	%		

4.5" Bituminous Overlay(15 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
PATCH		Ton	100.00	$20,536.00
TACK COAT		GAL	$1.00	$14,457.34
4.5" SPWEB340E	Wear	TON	57.00	$698,398.15
		Total Cost:		**$733,391**
		Cost/Mile:		**$142,850**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$142,850	1.000	$142,850	$6,172
Rout & seal	2	$2,000	0.952	$1,904	$82
Chipseal	4	$20,000	0.906	$18,119	$783
Mill & 3" Overlay	17	$145,117	0.657	$95,370	$4,121
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 Present Worth:			**$282,650**	$12,212
	Equivalent Annual Cost:			**$12,212**	$12,212

7.5" Unbonded Overlay(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
PASSRC		Ton	58.54	$299,943.27
Conc Std Width 7.5		SY	5.00	$361,433.60
Structural Concrete		CY	65.77	$990,478.66
Reinforcement Bars	Epoxy	lb	0.80	$25,546.78
Dowel Bars	Epoxy	each	5.20	$225,534.57
		Total Cost:		**$1,902,937**
		Cost/Mile:		**$370,654**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$370,654	1.000	$370,654	$16,014
Major CPR	20	$150,000	0.610	$91,541	$3,955
3.5" Bit. Overlay	30	$166,994	0.477	$79,613	$3,440
Rout & seal	32	$2,000	0.454	$908	$39
Remaining Life Value	35	($117,878)	0.421	-$49,670	-$2,146
	Total Present Worth:			**$493,045**	$21,302
	Equivalent Annual Cost:			**$21,302**	$21,302

Rubbilize and Bituminous Overlay(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
RUBBILIZE		SY	$1.62	$117,104.49
PATCH		Ton	100	$20,536.00
TACK COAT		**GAL**	$1.00	$14,457
4" SPWEB440E	Wear	TON	57	$931,197.53
7" SPNWB430B	Wear	TON	55	$1,572,416.88
		Total Cost:		**$2,655,712**
		Cost/Mile:		**$517,279**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$517,279	1.000	$517,279	$22,349
Rout & seal	2	$2,000	0.952	$1,904	$82
Chipseal	4	$20,000	0.906	$18,119	$783
Mill & 3" Overlay	22	$145,117	0.581	$84,293	$3,642
Rout & seal	24	$2,000	0.553	$1,106	$48
Chipseal	26	$20,000	0.526	$10,525	$455
Remaining Life Value	35	($34,146)	0.421	-$14,388	-$622
	Total Present Worth:			**$618,838**	$26,737
	Equivalent Annual Cost:			**$26,737**	$26,737

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

District	6
Performed By	TA check
Analysis Period	35
Discount Rate	2.5

Project Number	2508-31
Date	10/23/2012
Funding Category	RD
Low Cost Option #	1
Chosen Option #	

District	6
Performed By	TA check
Analysis Period	35
Discount Rate	2.5

OPTION #1

DESCRIPTION: Segment 1; 3" Mill, 3" HMA Overlay, & 6" SFDR

DESIGN LIFE: 20 **TYPE**: BIT

Year	#	Life	Description	Cost/Mile
0				$ 239,213
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8	BD		1st Crack Treatment	$ 1,500
9				$ -
10				$ -
11				$ -
12	AB		Surface Treatment	$ 20,000
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	BB	15	2" Mill & 3.5" HMA Overlay	$ 171,431
21				$ -
22				$ -
23	AA		Crack Treatment	$ 3,000
24				$ -
25				$ -
26				$ -
27	AB		Surface Treatment	$ 20,000
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 371,903
			Eq. Annual Cost*	$16,068
			% of Low Cost	100%

OPTION #2

DESCRIPTION: Segment 1; 3" Mill & 6" Whitetopping

DESIGN LIFE: 35 **TYPE**: PCC

Year	#	Life	Description	Cost/Mile
0				$ 287,652
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	AO		Reseal Joints (12')	$ 71,388
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	AQ		Minor CPR (12')	$ 157,103
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (60,424)
			Total Present Worth	$ 389,764
			Eq. Annual Cost*	$16,840
			% of Low Cost	105%

OPTION #3

DESCRIPTION: Segment 1; 3" Mill & 4.5" Whitetopping

DESIGN LIFE: 20 **TYPE**: PCC

Year	#	Life	Description	Cost/Mile
0				$ 203,191
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13	BG		Reseal Joints (6'X6') 20 yr	$ 194,289
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	BH		Major CPR (6'X6') 20 yr	$ 431,783
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 577,032
			Eq. Annual Cost*	$24,931
			% of Low Cost	155%

OPTION #4

DESCRIPTION: Segment 1; 3" Mill & 5.5" Whitetopping

DESIGN LIFE: 35 **TYPE**: PCC

Year	#	Life	Description	Cost/Mile
0				$ 236,231
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	BJ		Reseal Joint (6'x6') 5.5"	$ 194,289
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	BK		Minor CPR (6'x6') 5.5"	$ 334,932
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (128,820)
			Total Present Worth	$ 481,590
			Eq. Annual Cost*	$20,807
			% of Low Cost	129%

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

This design falls below the minimum 5" pavement thickness and will not be used.

* Equivalent Annual Cost is included for informatio

SP 2508-31 - Segment 2

District	6
Performed By	TA check
Analysis Period	35
Discount Rate	2.5

Project Number	2508-31
Date	10/23/2012
Funding Category	RD
Low Cost Option #	2
Chosen Option #	

District	
Performed By	TA check
Analysis Period	35
Discount Rate	2.5

OPTION #1

DESCRIPTION: Segment 2; 3" Mill, 5" HMA Overlay, & 6" SFDR

DESIGN LIFE: 20 — **TYPE**: BIT

Year	#	Life	Description	Cost/Mile
0				$ 335,964
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8	BD		1st Crack Treatment	$ 1,500
9				$ -
10				$ -
11				$ -
12	AB		Surface Treatment	$ 20,000
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	BB	15	2" Mill & 3.5" HMA Overlay	$ 171,431
21				$ -
22				$ -
23	AA		Crack Treatment	$ 3,000
24				$ -
25				$ -
26				$ -
27	AB		Surface Treatment	$ 20,000
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 468,654
			Eq. Annual Cost*	$20,248
			% of Low Cost	102%

OPTION #2

DESCRIPTION: Segment 2; 5" Mill & 8" Whitetopping

DESIGN LIFE: 35 — **TYPE**: PCC

Year	#	Life	Description	Cost/Mile
0				$ 375,916
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	AO		Reseal Joints (15')	$ 57,111
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	AQ		Minor CPR (15')	$ 130,791
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (50,304)
			Total Present Worth	$ 459,400
			Eq. Annual Cost*	$19,849
			% of Low Cost	100%

OPTION #3

DESCRIPTION: Segment 2; 5" Mill & 7" Whitetopping

DESIGN LIFE: 20 — **TYPE**: PCC

Year	#	Life	Description	Cost/Mile
0				$ 323,386
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13	BG		Reseal Joints (15') 20 yr	$ 74,797
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	BH		Minor CPR (15') 20 yr	$ 191,691
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 481,042
			Eq. Annual Cost*	$20,784
			% of Low Cost	105%

OPTION #4

DESCRIPTION: Segment 2; 6" Mill, 8" HMA Overlay, & 8" FDR

DESIGN LIFE: 20 — **TYPE**: BIT

Year	#	Life	Description	Cost/Mile
0				$ 406,542
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8	BD		1st Crack Treatment	$ 1,500
9				$ -
10				$ -
11				$ -
12	AB		Surface Treatment	$ 20,000
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	BJ		2.5" Mill & 4" HMA Overlay	$ 192,411
21				$ -
22				$ -
23	AA		Crack Treatment	$ 3,000
24				$ -
25				$ -
26				$ -
27	AB		Surface Treatment	$ 20,000
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 552,035
			Eq. Annual Cost*	$23,851
			% of Low Cost	120%

* Equivalent Annual Cost is included for information only.

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

* Equivalent Annual Cost is included for informatio

District	6
Performed By	TA check
Analysis Period	35
Discount Rate	2.5

Project Number	2508-31
Date	10/23/2012
Funding Category	RD
Low Cost Option #	4
Chosen Option #	

District	
Performed By	TA check
Analysis Period	35
Discount Rate	2.5

OPTION #1

DESCRIPTION: Segment 3; 3" Mill, 3" HMA Overlay, & 6" SFDR

DESIGN LIFE: 20 — **TYPE**: BIT

Year	#	Life	Description	Cost/Mile
0				$ 239,213
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8	BD		1st Crack Treatment	$ 1,500
9				$ -
10				$ -
11				$ -
12	AB		Surface Treatment	$ 20,000
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	BB	15	2" Mill & 3.5" HMA Overlay	$ 171,431
21				$ -
22				$ -
23	AA		Crack Treatment	$ 3,000
24				$ -
25				$ -
26				$ -
27	AB		Surface Treatment	$ 20,000
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 371,903
			Eq. Annual Cost*	$16,068
			% of Low Cost	101%

OPTION #2

DESCRIPTION: Segment 3; 4" Mill & 7" Whitetopping

DESIGN LIFE: 35 — **TYPE**: PCC

Year	#	Life	Description	Cost/Mile
0				$ 315,839
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	AO		Reseal Joints (15')	$ 57,111
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	AQ		Minor CPR (15')	$ 130,791
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (50,304)
			Total Present Worth	$ 399,323
			Eq. Annual Cost*	$17,253
			% of Low Cost	108%

OPTION #3

DESCRIPTION: Segment 3; 4" Mill & 6" Whitetopping

DESIGN LIFE: 20 — **TYPE**: PCC

Year	#	Life	Description	Cost/Mile
0				$ 293,557
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13	BG		Reseal Joints (12') 20 yr	$ 93,496
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	BH		Minor CPR (12') 20 yr	$ 233,228
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 487,182
			Eq. Annual Cost*	$21,049
			% of Low Cost	132%

OPTION #4

DESCRIPTION: Segment 3; 3" Mill, 4.5" HMA Overlay, & 12" FDR

DESIGN LIFE: 20 — **TYPE**: BIT

Year	#	Life	Description	Cost/Mile
0				$ 236,763
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8	BD		1st Crack Treatment	$ 1,500
9				$ -
10				$ -
11				$ -
12	AB		Surface Treatment	$ 20,000
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	BB	15	2" Mill & 3.5" HMA Overlay	$ 171,431
21				$ -
22				$ -
23	AA		Crack Treatment	$ 3,000
24				$ -
25				$ -
26				$ -
27	AB		Surface Treatment	$ 20,000
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 369,453
			Eq. Annual Cost*	$15,962
			% of Low Cost	100%

* Equivalent Annual Cost is included for information only.

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

* Equivalent Annual Cost is included for informatio

SP 2510-47

Cost Analysis T.H. 58 From T.H. 52 to 0.8 Mi. S. CSAH 5 Rt.

Givens:

Length =	18.421	miles		
Width of Road =	24	feet(Conc.)	24 feet(Bit.)	12/2/11-TRM
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.7	%		
Inflation Rate =	0	%		

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

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	$0.80	$207,494.14
PATCH		Ton	$100.00	$73,684.00
TACK COAT		GAL	$1.00	$51,873.54
3.5" SPWEB340B	Wear	TON	$50.00	$2,564,497.94
		Total Cost:		**$2,897,550**
		Cost/Mile:		**$157,296**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$157,296	1.000	$157,296	$7,003
Rout & seal	2	$2,000	0.948	$1,896	$84
Chipseal	4	$20,000	0.899	$17,978	$800
Mill & 3" Overlay	17	$133,184	0.636	$84,675	$3,770
Rout & seal	19	$2,000	0.603	$1,206	$54
Chipseal	21	$20,000	0.572	$11,430	$509
Mill & 3" Overlay	33	$133,184	0.415	$55,288	$2,462
Remaining Life Value	35	($115,426)	0.394	-$45,430	-$2,023
	Total Present Worth:			**$284,339**	$12,660
	Equivalent Annual Cost:			**$12,660**	$12,660

6" WHITETOPPING-doweled(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	$1.12	$290,491.80
Conc Std Width 6		SY	$5.00	$1,296,838.40
Structural Concrete		CY	$65.77	$2,843,102.05
Reinforcement Bars	Epoxy	lb	$0.80	$91,662.90
Dowel Bars	Epoxy	each	$5.20	$245,830.04
		Total Cost:		**$4,767,925**
		Cost/Mile:		**$258,831**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$258,831	1.000	$258,831	$11,524
Major CPR	20	$150,000	0.587	$88,040	$3,920
3.5" Bit. Overlay	30	$146,032	0.450	$65,665	$2,924
Rout & seal	32	$2,000	0.426	$853	$38
Remaining Life Value	35	($103,081)	0.394	-$40,571	-$1,806
	Total Present Worth:			**$372,818**	$16,599
	Equivalent Annual Cost:			**$16,599**	$16,599

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

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	$0.50	$129,683.84
PATCH		Ton	$100.00	$73,684.00
TACK COAT		GAL	$1.00	$77,810.30
4.5" SPWEB340B	Wear	TON	$50.00	$3,297,211.63
		Total Cost:		**$3,578,390**
		Cost/Mile:		**$194,256**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$194,256	1.000	$194,256	$8,649
Rout & seal	2	$2,000	0.948	$1,896	$84
Chipseal	4	$20,000	0.899	$17,978	$800
Mill & 3" Overlay	22	$133,184	0.556	$74,114	$3,300
Rout & seal	24	$2,000	0.528	$1,055	$47
Chipseal	26	$20,000	0.500	$10,005	$445
Remaining Life Value	35	($31,337)	0.394	-$12,334	-$549
	Total Present Worth:			**$286,971**	$12,777
	Equivalent Annual Cost:			**$12,777**	$12,777

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 -20 years, whitetopping-20 years.
4. Aggregate and shoulder quantities were not included in each option.
5. Calculations are based on 35 year life cycle.
6. Costs are based upon recent district project costs.
7. No chipseal on the bituminous overlay over whitetopping.

SP 2514-119

Cost Analysis/ TH 61 NB & SB From T.H. 19 to T.H. 316

Givens:

Length =	15.646	miles		
Width of Road =	24	feet(Conc.)	24 feet(Bit.)	7/01/13-TRM
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.5	%		
Inflation Rate =	0	%		

MILL 1.5" & 3" min. Bituminous Overlay (15 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	0.50	$110,147.84
PATCH		Ton	100.00	$62,584.00
TACK COAT		GAL	$1.00	$44,059.14
3" SPWEB440E	Wear	TON	55.00	$2,053,706.48
		Total Cost:		**$2,270,497**
		Cost/Mile:		**$145,117**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$145,117	1.000	$145,117	$6,270
Rout & seal	2	$2,000	0.952	$1,904	$82
Chipseal	4	$20,000	0.906	$18,119	$783
Mill & 3" Overlay	17	$146,525	0.657	$96,296	$4,161
Rout & seal	19	$2,000	0.626	$1,251	$54
Chipseal	21	$20,000	0.595	$11,908	$514
Mill & 3" Overlay	33	$146,525	0.443	$64,867	$2,803
Remaining Life Value	35	($126,988)	0.421	-$53,509	-$2,312
	Total Present Worth:			**$285,952**	$12,355
	Equivalent Annual Cost:			**$12,355**	$12,355

7" Whitetopping (20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	1.25	$275,369.60
Conc Std Width 7		SY	5.00	$1,101,478.40
Structural Concrete		CY	68.50	$2,934,048.40
Dowel Bars	Epoxy	each	8.19	$1,082,532.97
Reinforcement Bars	Epoxy	lb	0.80	$77,854.50
		Total Cost:		**$5,471,284**
		Cost/Mile:		**$349,692**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$349,692	1.000	$349,692	$15,109
Major CPR	20	$150,000	0.610	$91,541	$3,955
Remaining Life Value	35	$0	0.421	$0	$0
	Total Present Worth:			**$441,233**	$19,064
	Equivalent Annual Cost:			**$19,064**	$19,064

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

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	1.25	$275,369.60
PATCH		Ton	100.00	$62,584.00
TACK COAT		GAL	$1.00	$66,088.70
4.5" SPWEB440E	Wear	TON	55.00	$3,080,559.72
		Total Cost:		**$3,484,602**
		Cost/Mile:		**$222,715**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$222,715	1.000	$222,715	$9,623
Rout & seal	3	$2,000	0.929	$1,857	$80
Chipseal	5	$20,000	0.884	$17,677	$764
Mill & 3" Overlay	22	$146,525	0.581	$85,111	$3,677
Rout & seal	24	$2,000	0.553	$1,106	$48
Chipseal	26	$20,000	0.526	$10,525	$455
Remaining Life Value	35	($34,477)	0.421	-$14,528	-$628
	Total Present Worth:			**$324,463**	$14,019
	Equivalent Annual Cost:			**$14,019**	$14,019

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

District	4
Performed By	TA check
Analysis Period	35
Discount Rate	2.5

Project Number	2611-16
Date	12/3/2012
Funding Category	RD
Low Cost Option #	1
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
7" Mill & 7" HMA Overlay					7" Mill, 1" HMA OL, & 6" UBOL					7" Mill, 2" HMA OL, 5" UBOL				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			20	BIT				30	PCC				20	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0				$ 381,842	0				$ 364,358	0				$ 375,610
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3				$ -	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6	BE		Light Crack Treatment	$ 1,500	6				$ -	6				$ -
7				$ -	7				$ -	7				$ -
8				$ -	8				$ -	8				$ -
9				$ -	9				$ -	9				$ -
10	AB		Surface Treatment	$ 20,000	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12				$ -	12				$ -	12				$ -
13				$ -	13				$ -	13	AN		Reseal Joints (6'X6')	$ 180,411
14				$ -	14				$ -	14				$ -
15				$ -	15	AN		Reseal Joints (6'X6')	$ 180,411	15				$ -
16				$ -	16				$ -	16				$ -
17				$ -	17				$ -	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20	BA	15	2.5" Mill & 4" HMA Overlay	$ 234,308	20				$ -	20				$ -
21				$ -	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23	AA		Crack Treatment	$ 3,000	23				$ -	23				$ -
24				$ -	24				$ -	24				$ -
25				$ -	25	AR		Major CPR (6'X6')	$ 346,318	25	BC		Major CPR (6'x6') 20 yr	$ 436,251
26				$ -	26				$ -	26				$ -
27	AB		Surface Treatment	$ 20,000	27				$ -	27				$ -
28				$ -	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31				$ -	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34				$ -	34				$ -
35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 553,719				Total Present Worth	$ 675,726				Total Present Worth	$ 741,794
			Eq. Annual Cost*	$23,924				Eq. Annual Cost*	$29,195				Eq. Annual Cost*	$32,050
			% of Low Cost	100%				% of Low Cost	122%				% of Low Cost	134%

* Equivalent Annual Cost is included for information only.

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

District	Metro
Performed By	Jon Re
Analysis Period	35
Discount Rate	2.5

Project Number	2726-69, TH47
Date	1/14/2013
Funding Category	RD
Low Cost Option #	1
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
2.5" Mill & 2.5" Overlay					5" Mill & 6" UBCO					5" Mill, Rubblization, 6" Bit OL				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			14	BIT				20	PCC				20	BIT
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0			2.5" Mill & 2.5" Overlay	$ 222,574	0			5" Mill & 6" UBCO	$ 711,549	0			5" Mill, Rubblization, 6" Bit OL	$ 596,290
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3	AA		Crack Treatment	$ 6,500	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7	BD		Chip Seal	$ 45,000	7				$ -	7				$ -
8				$ -	8				$ -	8	AA		Crack Treatment	$ 6,500
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12				$ -	12				$ -	12	BD		Chip Seal	$ 45,000
13				$ -	13	AQ		Minor CPR (15')	$ 360,822	13				$ -
14	BA		3.5" M&O	$ 311,787	14				$ -	14				$ -
15				$ -	15				$ -	15				$ -
16				$ -	16				$ -	16				$ -
17	AA		Crack Treatment	$ 6,500	17				$ -	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20				$ -	20				$ -	20	AK		3" Mill & 3" Overlay	$ 270,689
21	BD		Chip Seal	$ 45,000	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23				$ -	23				$ -	23	AA		Crack Treatment	$ 6,500
24				$ -	24				$ -	24				$ -
25				$ -	25	AS		Major CPR (15')	$ 801,883	25				$ -
26				$ -	26				$ -	26				$ -
27	BB		4" M&O	$ 353,495	27				$ -	27	BD		Chip Seal	$ 45,000
28				$ -	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30	AA		Crack Treatment	$ 6,500	30				$ -	30				$ -
31				$ -	31				$ -	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34	BD		Chip Seal	$ 45,000	34				$ -	34				$ -
35			Remaining Service Life Value**	$ (117,831.80)	35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 672,560				Total Present Worth	$ 1,405,825				Total Present Worth	$ 827,065
			Eq. Annual Cost*	$29,058				Eq. Annual Cost*	$60,739				Eq. Annual Cost*	$35,734
			% of Low Cost	100%				% of Low Cost	209%				% of Low Cost	123%

* Equivalent Annual Cost is included for information only.

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

District	Metro
Performed By	DFN
Analysis Period	35
Discount Rate	2.5

Project Number	2772-92
Date	2/1/2013
Funding Category	RS
Low Cost Option #	1
Chosen Option #	

OPTION #1

DESCRIPTION	DESIGN LIFE	TYPE
4.0" mill and 4.0" SMA overlay	20	BIT

Year	#	Life	Description	Cost/Mile
0			4.0" mill and 4.0" SMA overlay	$ 402,152
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7	AA		Crack Treatment	$ 3,000
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	BD		4" mill and 4" overlay	$ 258,324
21				$ -
22				$ -
23	AA		Crack Treatment	$ 3,000
24				$ -
25				$ -
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31	BD		4" mill and 4" overlay	$ 258,324
32				$ -
33				$ -
34				$ -
35	BB		Remaining Service Life Value**	$ (154,994)
			Total Present Worth	$ 618,863
			Eq. Annual Cost*	$26,738
			% of Low Cost	100%

OPTION #2

DESCRIPTION	DESIGN LIFE	TYPE
Concrete rubblize and 8.5 inch bituminous overlay	20	BIT

Year	#	Life	Description	Cost/Mile
0			Rubblize and 8.5 inch bit overlay	$ 713,725
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8	BC		Light Crack Treatment	$ 1,500
9				$ -
10				$ -
11				$ -
12	AB		Surface Treatment	$ 33,000
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	BE		3" mill and 3" overlay	$ 197,811
21				$ -
22				$ -
23	AA		Crack Treatment	$ 3,000
24				$ -
25				$ -
26				$ -
27	AB		Surface Treatment	$ 33,000
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 878,854
			Eq. Annual Cost*	$37,971
			% of Low Cost	142%

OPTION #3

DESCRIPTION	DESIGN LIFE	TYPE
8.0" UBCO	20	PCC

Year	#	Life	Description	Cost/Mile
0			8.0" UBCO	$ 826,161
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13	AQ		Minor CPR (15')	$ 74,797
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	AS		Major CPR (15')	$ 227,001
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 1,002,862
			Eq. Annual Cost*	$43,329
			% of Low Cost	162%

* Equivalent Annual Cost is included for information only.

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

SP 2802-66

Cost Analysis/ TH 26 (IA/MN SL to T.H. 16)

Givens:

Length =	21.121	miles		
Width of Road =	24	feet(Conc.)	24 feet(Bit.)	12/02/11-TRM
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.7	%		
Inflation Rate =	0	%		

MILL & 3" Bituminous Overlay(15 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	0.50	$148,691.84
PATCH		Ton	100.00	$84,484.00
TACK COAT		GAL	$1.00	$59,476.74
3" SPWEB340B	Wear	TON	50.00	$2,520,326.69
		Total Cost:		**$2,812,979**
		Cost/Mile:		**$133,184**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$133,184	1.000	$133,184	$5,930
Rout & seal	2	$2,000	0.948	$1,896	$84
Chipseal	4	$20,000	0.899	$17,978	$800
Mill & 3" Overlay	17	$135,296	0.636	$86,018	$3,830
Rout & seal	19	$2,000	0.603	$1,206	$54
Chipseal	21	$20,000	0.572	$11,430	$509
Mill & 3" Overlay	33	$135,296	0.415	$56,164	$2,501
Remaining Life Value	35	($117,257)	0.394	-$46,150	-$2,055
		Total Present Worth:		**$261,726**	$11,653
		Equivalent Annual Cost:		**$11,653**	$11,653

5.5" WHITETOPPING-doweled(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	1.12	$333,069.72
Conc Std Width 5		SY	5.00	$1,486,918.40
Structural Concrete		CY	65.77	$2,987,951.72
Dowel Bars	Epoxy	each	5.2	$370,721.89
Reinforcement Bars	Epoxy	lb	0.80	$105,098.10
		Total Cost:		**$5,283,760**
		Cost/Mile:		**$250,166**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$250,166	1.000	$250,166	$11,138
Minor CPR	20	$150,000	0.587	$88,040	$3,920
3.5" Bit. Overlay	30	$155,536	0.450	$69,939	$3,114
Remaining Life Value	35	($103,691)	0.394	-$40,811	-$1,817
		Total Present Worth:		**$367,335**	$16,355
		Equivalent Annual Cost:		**$16,355**	$16,355

MILL & 1.5" Bituminous Overlay(10 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	0.50	$148,691.84
PATCH		Ton	100.00	$84,484.00
TACK COAT		GAL	$1.00	$29,738.37
1.5" SPWEB340B	Wear	TON	50.00	$1,260,163.34
		Total Cost:		**$1,523,078**
		Cost/Mile:		**$72,112**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$72,112	1.000	$72,112	$3,211
Clean & seal	2	$2,000	0.948	$1,896	$84
Chipseal	4	$20,000	0.899	$17,978	$800
Mill & 3" Overlay	11	$135,296	0.746	$100,928	$4,494
Rout & seal	13	$2,000	0.707	$1,415	$63
Chipseal	15	$20,000	0.671	$13,411	$597
Mill & 3" Overlay	28	$135,296	0.474	$64,167	$2,857
Rout & seal	30	$2,000	0.450	$899	$40
Chipseal	32	$20,000	0.426	$8,527	$380
Remaining Life Value	35	($76,104)	0.394	-$29,953	-$1,334
		Total Present Worth:		**$251,380**	$11,192
		Equivalent Annual Cost:		**$11,192**	$11,192

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

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	1.10	$327,122.05
PATCH		Ton	100.00	$0.00
TACK COAT		GAL	$1.00	$59,476.74
4.5" SPWEB340B	Wear	TON	50.00	$3,780,490.03
		Total Cost:		**$4,167,089**
		Cost/Mile:		**$197,296**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$197,296	1.000	$197,296	$8,784
Rout & seal	2	$2,000	0.948	$1,896	$84
Chipseal	4	$20,000	0.899	$17,978	$800
Mill & 3" Overlay	22	$135,296	0.556	$75,290	$3,352
Rout & seal	24	$2,000	0.528	$1,055	$47
Chipseal	26	$20,000	0.500	$10,005	$445
Remaining Life Value	35	($31,834)	0.394	-$12,529	-$558
		Total Present Worth:		**$290,991**	$12,956
		Equivalent Annual Cost:		**$12,956**	$12,956

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

Project Number	3411-74
Date	5/24/2012
Funding Category	RC
Low Cost Option #	1
Chosen Option #	

OPTION #1					OPTION #2				
DESCRIPTION					DESCRIPTION				
1.5" mill 3" overlay					6.5" Whitetopping				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			15 years	BIT				15 years	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0			1.5" mill 3" overlay	$ 200,000	0			6.5" whitetopping	$ 439,000
1				$ -	1				$ -
2				$ -	2				$ -
3	aa		Crack Treatment	$ 7,000	3				$ -
4				$ -	4				$ -
5	ab		Surface Treatment	$ 21,000	5				$ -
6				$ -	6				$ -
7				$ -	7				$ -
8				$ -	8				$ -
9				$ -	9				$ -
10				$ -	10				$ -
11				$ -	11				$ -
12				$ -	12	be		1st CPR 12' Jt @ 15 yr	$ 32,943
13				$ -	13				$ -
14				$ -	14				$ -
15	ak		3" Mill & 3" Overlay	$ 263,000	15				$ -
16				$ -	16				$ -
17				$ -	17				$ -
18	aa		Crack Treatment	$ 7,000	18				$ -
19				$ -	19				$ -
20	ab		Surface Treatment	$ 21,000	20	bf		2nd CPR 12' Jt @ 15 yr	$ 251,151
21				$ -	21				$ -
22				$ -	22				$ -
23				$ -	23				$ -
24				$ -	24				$ -
25				$ -	25				$ -
26				$ -	26				$ -
27				$ -	27				$ -
28				$ -	28				$ -
29	ak		3" Mill & 3" Overlay	$ 263,000	29				$ -
30				$ -	30	ax		Concrete Whitetopping	$ 492,000
31				$ -	31				$ -
32	aa		Crack Treatment	$ 7,000	32				$ -
33				$ -	33				$ -
34	ab		Surface Treatment	$ 21,000	34				$ -
35			Remaining Service Life Value**	$ (121,385)	35			Remaining Service Life Value**	$ (330,000)
			Total Present Worth	$ 503,014				Total Present Worth	$ 701,690
			Eq. Annual Cost*	$22,396				Eq. Annual Cost*	$31,242
			% of Low Cost	100%				% of Low Cost	139%

* Equivalent Annual Cost is included for information only.

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

District	8
Performed By	
Analysis Period	35
Discount Rate	2.5

Project Number	3706-41
Date	11/20/2012
Funding Category	1
Low Cost Option #	3
Chosen Option #	

OPTION #1

DESCRIPTION				
6" Milling, 4" RAP + 3" CL 5, 8" HMA OL for BFD Segment				
			DESIGN LIFE	TYPE
			20	1
Year	#	Life	Description	Cost/Mile
0	BD	20	6" Mill, 4" RAP+3"CL 5 & 8" OL	$ 513,980
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8	BN		Light Crack Treatment	$ 1,500
9				$ -
10				$ -
11				$ -
12	AB		Surface Treatment	$ -
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	BQ		2.5" mill & 4" OL + 1.5" OL Shoul	$ 218,345
21				$ -
22				$ -
23	AA		Crack Treatment	$ -
24				$ -
25				$ -
26				$ -
27	AB		Surface Treatment	$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 648,461
			Eq. Annual Cost*	$28,017
			% of Low Cost	107%

OPTION #2

DESCRIPTION				
6" milling & 7" Whitetopping, 20 yr Design				
			DESIGN LIFE	TYPE
			20	2
Year	#	Life	Description	Cost/Mile
0	BF	20	Whitetopping 20 yr	$ 458,145
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13	BH		1st CPR, 20 yr Design	$ 72,126
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	BI		2nd CPR 20 yr Design	$ 297,521
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 670,947
			Eq. Annual Cost*	$28,989
			% of Low Cost	111%

OPTION #3

DESCRIPTION				
6" milling & 8" Whitetopping, 35 yr Design				
			DESIGN LIFE	TYPE
			35	2
Year	#	Life	Description	Cost/Mile
0	BG	35	Whitetopping 35 yr	$ 486,269
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	BK		1st CPR, 35 yr Design	$ 55,071
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	BL		2nd CPR 35 yr Design	$ 238,796
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (91,844.67)
			Total Present Worth	$ 606,358
			Eq. Annual Cost*	$26,198
			% of Low Cost	100%

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

SP 3706-41 - Segment 2

District	8
Performed By	
Analysis Period	35
Discount Rate	2.5

Project Number	3706-41
Date	11/20/2012
Funding Category	1
Low Cost Option #	3
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
6" Bituminous Mill & Overlay					5" milling & 5" Unbonded Concrete Overlay, 20 yr Design					6" milling & 6" Unbonded Concrete Overlay, 35 yr Design				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			20	1				20	2				35	2
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0	BA	20	6" Mill & 6" Overlay	$ 376,858	0	BF	20	Concrete Overlay, 20 yr Design	$ 339,255	0	BG	35	Concrete Overlay, 35 yr Design	$ 430,796
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3				$ -	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7				$ -	7				$ -	7				$ -
8	AA		Crack Treatment	$ 3,000	8				$ -	8				$ -
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12	AB		Chip Seal	$ 20,000	12				$ -	12				$ -
13				$ -	13	BH		1st CPR, 20 yr Design	$ 187,350	13				$ -
14				$ -	14				$ -	14				$ -
15				$ -	15				$ -	15				$ -
16				$ -	16				$ -	16				$ -
17				$ -	17				$ -	17	BK		1st CPR, 35 yr Design	$ 68,839
18				$ -	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20	BA		6" Mill & 6" Overlay	$ 376,858	20				$ -	20				$ -
21				$ -	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23	AA		Crack Treatment	$ 3,000	23				$ -	23				$ -
24				$ -	24				$ -	24				$ -
25				$ -	25	BI		2nd CPR 20 yr Design	$ 512,137	25				$ -
26				$ -	26				$ -	26				$ -
27	AB		Chip Seal	$ 20,000	27				$ -	27	BL		2nd CPR 35 yr Design	$ 247,267
28				$ -	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31				$ -	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34				$ -	34				$ -
35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ (95,102.61)
			Total Present Worth	$ 636,145				Total Present Worth	$ 751,404				Total Present Worth	$ 562,909
			Eq. Annual Cost*	$27,485				Eq. Annual Cost*	$32,465				Eq. Annual Cost*	$24,321
			% of Low Cost	113%				% of Low Cost	133%				% of Low Cost	100%

* Equivalent Annual Cost is included for information only.

5" thickness falls below the minimum pavement thickness and will not be used.

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

SP 3808-35

District	1
Performed By	CM/SH
Analysis Period	35
Discount Rate	2.5

Project Number	SP 3808-35
Date	4/8/2013
Funding Category	RC
Low Cost Option #	1
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
6" Mill 12" Reclaim 7" Bituminous					8" Mill 8" Unbonded PCC					FDR and 6"x6'x6' PCC Pavement				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			20	BIT				35	BIT				20	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0	BM		6" Mill 12" Reclaim 7" Bituminous	$ 196,000	0	BN		8" Mill 8" Unbonded PCC	$ 197,000	0	BP		FDR and 6"x6'x6' PCC Pavement	$ 152,000
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3				$ -	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7				$ -	7				$ -	7				$ -
8	AA		Crack Treatment	$ 1,100	8				$ -	8				$ -
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12	AB		Surface Treatment	$ 9,500	12				$ -	12				$ -
13				$ -	13				$ -	13	AN		Reseal Joints (6'X6')	$ 59,000
14				$ -	14				$ -	14				$ -
15				$ -	15				$ -	15				$ -
16				$ -	16				$ -	16				$ -
17				$ -	17	AO		Reseal Joints (15')	$ 10,000	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20	AH		2" Mill & 2" Overlay	$ 55,000	20				$ -	20				$ -
21				$ -	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23	AA		Crack Treatment	$ 1,100	23				$ -	23				$ -
24				$ -	24				$ -	24				$ -
25				$ -	25				$ -	25	AR		Major CPR (6'X6')	$ 119,000
26				$ -	26				$ -	26				$ -
27	AB		Surface Treatment	$ 9,500	27	AQ		Minor CPR (15')	$ 125,000	27				$ -
28				$ -	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31				$ -	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34				$ -	34				$ -
35	AH	0%	Remaining Service Life Value**	$ -	35	AQ	38%	Remaining Service Life Value**	$ (47,500)	35	AR	0%	Remaining Service Life Value**	$ -
			Total Present Worth	$ 243,032				Total Present Worth	$ 247,732				Total Present Worth	$ 258,987
			Eq. Annual Cost*	$10,500				Eq. Annual Cost*	$10,703				Eq. Annual Cost*	$11,190
			% of Low Cost	100%				% of Low Cost	102%				% of Low Cost	107%

* Equivalent Annual Cost is included for information only.

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

LIFE CYCLE COST ANALYSIS

SP	**4308-32**	DATE	6/28/2010	1) Complete all highlighted cells & enter corresponding letter of desired fix into year of fix	Analysis Period (years) = 35
TH	22	BY	sjp	2) Enter a "x" in the preferred option and justify at bottom of sheet	Salvage Value =
				3) CLICK ON "print" TAB TO VIEW AND PRINT DOCUMENT FOR MDR OR SCOPING REPORT	Discount Rate (%) = 2.84
					Inflation Rate = 0

- Low Cost Option

Option 1 — Design Life = 20 — 6" UBOL - 12' WIDE

Year	Proposed Fixes	Cost/Mile	P/F	Present Worth	Annual Cost
0	6" UBOL - 12' WID	$ 757,739	1.000	$ 757,739	$34,446
1			0.972		
2			0.946		
3			0.919		
4			0.894		
5			0.869		
6			0.845		
7			0.822		
8			0.799		
9			0.777		
10			0.756		
11			0.735		
12			0.715		
13			0.695		
14			0.676		
15	Minor CPR (draina	$ 35,000	0.657	$ 22,995	$ 1,045
16			0.639		
17			0.621		
18			0.604		
19			0.587		
20			0.571		
21			0.555		
22			0.540		
23			0.525		
24			0.511		
25	Major CPR (draina	$ 85,000	0.497	$ 42,205	$ 1,919
26			0.483		
27			0.469		
28			0.457		
29			0.444		
30			0.432		
31			0.420		
32			0.408		
33			0.397		
34			0.386		
35	end of life		0.375		
			Total Present Worth:	**$ 822,939**	$37,410
			Equivalent Annual Cost:	$ 37,410	$37,410

Option 2 — Design Life = 12 — 4" BIT OL - 11' lanes

	Year	Proposed Fixes	Cost/Mile	P/F	Present Worth	Annual Cost
h	0	4" BIT OL - 11' l	$ 287,846	1.000	$ 287,846	$13,085
	1			0.972		
	2			0.946		
	3			0.919		
	4			0.894		
	5			0.869		
	6			0.845		
	7			0.822		
	8			0.799		
	9			0.777		
	10			0.756		
	11			0.735		
i	12	1.5" OL 11' lane	$ 61,929	0.715	$ 44,254	$2,012
	13			0.695		
	14			0.676		
	15			0.657		
	16			0.639		
	17			0.621		
	18			0.604		
	19			0.587		
j	20	5.5 M & 4" OL -	$ 225,726	0.571	$ 128,926	$5,861
	21			0.555		
	22			0.540		
	23			0.525		
	24			0.511		
	25			0.497		
	26			0.483		
	27			0.469		
	28			0.457		
	29			0.444		
	30			0.432		
j	31	5.5 M & 4" OL -	$ 225,726	0.420	$ 94,745	$4,307
	32			0.408		
	33			0.397		
	34			0.386		
k	35	salvage value	$ 143,644	0.375	$ 53,903	$2,450
				Total Present Worth:	**$ 609,674**	$27,715
				Equivalent Annual Cost:	$ 27,715	$27,715

Option 3 — Design Life = 12 — 5" UBOL - 12' wide

	Year	Proposed Fixes	Cost/Mile	P/F	Present Worth	Annual Cost
m	0	5" UBOL - 12' wid	$ 712,705	1.000	$ 712,705	$32,399
	1			0.972		
	2			0.946		
	3			0.919		
	4			0.894		
	5			0.869		
	6			0.845		
e	7	Minor CPR (drain	$ 35,000	0.822	$ 28,770	$ 1,308
	8			0.799		
	9			0.777		
	10			0.756		
	11			0.735		
	12			0.715		
	13			0.695		
	14			0.676		
	15			0.657		
	16			0.639		
f	17	Major CPR (drain	$ 85,000	0.621	$ 52,804	$ 2,400
	18			0.604		
	19			0.587		
	20			0.571		
	21			0.555		
	22			0.540		
n	23	3" BIT OL - 12' la	$ 126,978	0.525	$ 66,681	$ 3,031
	24			0.511		
	25			0.497		
	26			0.483		
	27			0.469		
	28			0.457		
	29			0.444		
	30			0.432		
	31			0.420		
	32			0.408		
	33			0.397		
	34			0.386		
l	35	end of life		0.375		
				Total Present Worth:	**$ 860,959**	$39,138
				Equivalent Annual Cost:	$ 39,138	$39,138

District	8
Performed By	MJB
Analysis Period	35
Discount Rate	2.5

Project Number	4703-26
Date	3/26/2013
Funding Category	RD
Low Cost Option #	1
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
3" Bituminous Mill & Overlay					6.5" Whitetopping					8" Whitetopping				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			15	BIT 1				15	PCC 2				35	PCC 3
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0	AK	15	3" Mill & 3" Overlay	$ 160,829	0	BD	15	6.5" Whitetopping	$ 432,881	0	BH	35	8" Whitetopping	$ 490,921
1		14		$ -	1				$ -	1				$ -
2		13		$ -	2				$ -	2				$ -
3	AA	12	Crack Treatment	$ 3,000	3				$ -	3				$ -
4		11		$ -	4				$ -	4				$ -
5		10		$ -	5				$ -	5				$ -
6		9		$ -	6				$ -	6				$ -
7	AB	8	Surface Treatment	$ 20,000	7				$ -	7				$ -
8		7		$ -	8				$ -	8				$ -
9		6		$ -	9				$ -	9				$ -
10		5		$ -	10				$ -	10				$ -
11		4		$ -	11				$ -	11				$ -
12		3		$ -	12	BE		1st CPR	$ 93,496	12				$ -
13		2		$ -	13				$ -	13				$ -
14		1		$ -	14				$ -	14				$ -
15	BB	14	2" Mill & 3.5" Overlay	$ 170,091	15				$ -	15				$ -
16		13		$ -	16				$ -	16				$ -
17		12		$ -	17				$ -	17	BI		1st CPR	$ 57,111
18	AA	11	Crack Treatment	$ 3,000	18				$ -	18				$ -
19		10		$ -	19				$ -	19				$ -
20		9		$ -	20	BF		2nd CPR	$ 233,228	20				$ -
21		8		$ -	21				$ -	21				$ -
22	AB	7	Surface Treatment	$ 20,000	22				$ -	22				$ -
23		6		$ -	23				$ -	23				$ -
24		5		$ -	24				$ -	24				$ -
25		4		$ -	25				$ -	25				$ -
26		3		$ -	26				$ -	26				$ -
27		2		$ -	27				$ -	27	BJ		2nd CPR	$ 130,791
28		1		$ -	28				$ -	28				$ -
29	BB	13	2" Mill & 3.5" Overlay	$ 170,091	29				$ -	29				$ -
30		12		$ -	30	BL		Remove/Replace Concrete	$ 415,129	30				$ -
31		11		$ -	31				$ -	31				$ -
32	AA	11	Crack Treatment	$ 3,000	32				$ -	32				$ -
33		9		$ -	33				$ -	33				$ -
34		8		$ -	34				$ -	34				$ -
35		7	Remaining Service Life Value**	$ (91,587.59)	35			Remaining Service Life Value**	$ (276,752.83)	35			Remaining Service Life Value**	$ (50,304.14)
			Total Present Worth	**$ 357,309**				Total Present Worth	$ 726,027				Total Present Worth	$ 574,405
			Eq. Annual Cost*	**$15,438**				Eq. Annual Cost*	$31,368				Eq. Annual Cost*	$24,818
			% of Low Cost	**100%**				% of Low Cost	203%				% of Low Cost	161%

* Equivalent Annual Cost is included for information only.

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

District	7
Performed By	Chris Bower
Analysis Period	35
Discount Rate	2.7

Project Number	5380-134
Date	9/22/2012
Funding Category	RS
Low Cost Option #	3
Chosen Option #	3

District	7
Performed By	Chris Bower
Analysis Period	35
Discount Rate	2.7

Project Number	5380-134
Date	9/22/2012
Funding Category	RS
Low Cost Option #	1/3/1900
Chosen Option #	1/3/1900

OPTION #1

DESCRIPTION	DESIGN LIFE	TYPE
3" M+O	9	BIT

Year	#	Life	Description	Cost/Mile
0			Initial Construction	$ 192,276
1				$ -
2				$ -
3	AA		Crack Treatment	$ 10,000
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9	BA	8	2" Mill, 3.5" O/L	$ 177,396
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	BA	7	2" Mill, 3.5" O/L	$ 177,396
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24	BA	6	2" Mill, 3.5" O/L	$ 177,396
25				$ -
26				$ -
27				$ -
28				$ -
29				$ -
30	BA	5	2" Mill, 3.5" O/L	$ 177,396
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 627,232
			Eq. Annual Cost*	$27,927
			% of Low Cost	120%

OPTION #2

DESCRIPTION	DESIGN LIFE	TYPE
3" M+O plus UTBWC	9	BIT

Year	#	Life	Description	Cost/Mile
0			Initial Construction	$ 253,289
1				$ -
2				$ -
3	AA		Crack Treatment	$ 10,000
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9	BA	8	2" Mill, 3.5" O/L	$ 177,396
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	BA	7	2" Mill, 3.5" O/L	$ 177,396
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24	BA	6	2" Mill, 3.5" O/L	$ 177,396
25				$ -
26				$ -
27				$ -
28				$ -
29				$ -
30	BA	5	2" Mill, 3.5" O/L	$ 177,396
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 688,245
			Eq. Annual Cost*	$30,643
			% of Low Cost	131%

OPTION #3

DESCRIPTION	DESIGN LIFE	TYPE
Mill 3" (DL only), O/L 4.5" in DL, 1.5" everything else	14	BIT

Year	#	Life	Description	Cost/Mile
0			Initial Construction	$ 247,071
1				$ -
2				$ -
3	AA		Crack Treatment	$ 10,000
4				$ -
5				$ -
6				$ -
7	BB		Chip Seal	$ 40,000
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14	BA		2" Mill, 3.5" O/L	$ 177,396
15				$ -
16				$ -
17	AA		Crack Treatment	$ 10,000
18				$ -
19				$ -
20				$ -
21	BB		Chip Seal	$ 40,000
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	BA		2" Mill, 3.5" O/L	$ 177,396
28				$ -
29				$ -
30	AA		Crack Treatment	$ 10,000
31				$ -
32				$ -
33				$ -
34	BB		Chip Seal	$ 40,000
35			Remaining Service Life Value**	$ (59,132)
			Total Present Worth	$ 524,681
			Eq. Annual Cost*	$23,361
			% of Low Cost	100%

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

OPTION #4

DESCRIPTION	DESIGN LIFE	TYPE
35 Year UBOL	35	PCC

Year	#	Life	Description	Cost/Mile
0			Initial Construction	$ 555,279
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	BD		1st 35 year CPR	$ 20,194
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	BF		2nd 35 year CPR	$ 111,359
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (42,830.39)
			Total Present Worth	$ 605,501
			Eq. Annual Cost*	$26,959
			% of Low Cost	115%

OPTION #5

DESCRIPTION	DESIGN LIFE	TYPE
20 Year UBOL	20	PCC

Year	#	Life	Description	Cost/Mile
0			Initial Construction	$ 510,441
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13	BC		1st 20 year CPR	$ 25,378
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	BE		2nd 20 year CPR	$ 165,557
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 613,443
			Eq. Annual Cost*	$27,313
			% of Low Cost	117%

OPTION #6

DESCRIPTION	DESIGN LIFE	TYPE
Bituminous Reconstruct	20	BIT

Year	#	Life	Description	Cost/Mile
0			Initial Construction	$ 803,662
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8	AA		Crack Treatment	$ 10,000
9				$ -
10				$ -
11				$ -
12	BB		Chip Seal	$ 40,000
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	BA		2" Mill, 3.5" O/L	$ 177,396
21				$ -
22				$ -
23	AA		Crack Treatment	$ 10,000
24				$ -
25				$ -
26				$ -
27	BB		Chip Seal	$ 40,000
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 969,819
			Eq. Annual Cost*	$43,180
			% of Low Cost	185%

* Equivalent Annual Cost is included for information only.

District	2
Performed By	K.Olson
Analysis Period	35
Discount Rate	2.5

Project Number	5407-31
Date	5/13/2013
Funding Category	Other
Low Cost Option #	
Chosen Option #	

District	2
Performed By	K.Olson
Analysis Period	35
Discount Rate	2.5

OPTION #1

DESCRIPTION	DESIGN LIFE	TYPE
4.5" bituminous	20	BIT

Year	#	Life	Description	Cost/Mile
0				$ 313,565
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8	AA		Crack Treatment	$ 3,000
9				$ -
10				$ -
11				$ -
12	AB		Surface Treatment	$ 23,000
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	AK		3" Mill & 3" Overlay	$ 161,467
21				$ -
22				$ -
23	AA		Crack Treatment	$ 3,000
24				$ -
25				$ -
26				$ -
27	AB		Surface Treatment	$ 23,000
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	
			Total Present Worth	$ 445,176
			Eq. Annual Cost*	$19,234
			% of Low Cost	100%

OPTION #2

DESCRIPTION	DESIGN LIFE	TYPE
5" UBOL W/1.5" bond breaker	20	PCC

Year	#	Life	Description	Cost/Mile
0				$ 530,087
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13	AN		Reseal Joints (6'X7')	$ 208,167
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	AT		Major CPR(6x7)	$ 462,625
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 930,631
			Eq. Annual Cost*	$40,208
			% of Low Cost	209%

OPTION #3

DESCRIPTION	DESIGN LIFE	TYPE
new 7.0" conc	35	PCC

Year	#	Life	Description	Cost/Mile
0				$ 573,932
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	AM		Reseal Joints (15')	$ 61,190
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	BB		Minor CPR & full depth (15')	$ 140,133
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35	##		Remaining Service Life Value**	$ (53,251)
			Total Present Worth	$ 663,651
			Eq. Annual Cost*	$28,673
			% of Low Cost	149%

OPTION #4

DESCRIPTION	DESIGN LIFE	TYPE
6" UBOL	35	PCC

Year	#	Life	Description	Cost/Mile
0				$ 563,655
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	AO		Reseal Joints (12')	$ 76,487
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	AP		Minor CPR (12')	$ 168,324
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35	##		Remaining Service Life Value**	$ (63,963)
			Total Present Worth	$ 673,387
			Eq. Annual Cost*	$29,094
			% of Low Cost	151%

* Equivalent Annual Cost is included for information only.

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

2grade raise

* Equivalent Annual Cost is included for informatio

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

Project Number	5408-30
Date	5/15/2012
Funding Category	RS
Low Cost Option #	3
Chosen Option #	1&4

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

OPTION #1

DESCRIPTION	DESIGN LIFE	TYPE
3.0" mill,9" reclaim 5" bit	20	BIT

Year	#	Life	Description	Cost/Mile
0				$ 463,404
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8	AA		Crack Treatment	$ 5,000
9				$ -
10				$ -
11				$ -
12	AB		Surface Treatment	$ 20,000
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	AH	15	2" Mill & 2" Overlay	$ 99,628
21				$ -
22				$ -
23	AA		Crack Treatment	$ 5,000
24				$ -
25				$ -
26				$ -
27	AB		Surface Treatment	$ 20,000
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 552,898
			Eq. Annual Cost*	$24,617
			% of Low Cost	101%

OPTION #2

DESCRIPTION	DESIGN LIFE	TYPE
2" mill, 5" whitetopping	20	PCC

Year	#	Life	Description	Cost/Mile
0				$ 429,600
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13	AN		Reseal Joints (6'X7')	$ 97,945
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	AT		Major CPR(6x7)	$ 271,098
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 638,146
			Eq. Annual Cost*	$28,413
			% of Low Cost	117%

OPTION #3

DESCRIPTION	DESIGN LIFE	TYPE
2" mill, 6" whitetopping	35	PCC

Year	#	Life	Description	Cost/Mile
0				$ 495,288
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	AO		Reseal Joints (12')	$ 27,184
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	AP		Minor CPR (12')	$ 100,868
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35	38%		Remaining Service Life Value**	$ (38,330)
			Total Present Worth	$ 546,616
			Eq. Annual Cost*	$24,337
			% of Low Cost	100%

OPTION #4

DESCRIPTION	DESIGN LIFE	TYPE
3.0" mill , 9" reclaim, 6.0" conc.	35	PCC

Year	#	Life	Description	Cost/Mile
0				$ 511,063
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	AO		Reseal Joints (12')	$ 27,184
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	AP		Minor CPR (12')	$ 100,868
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35	##		Remaining Service Life Value**	$ (38,330)
			Total Present Worth	$ 562,390
			Eq. Annual Cost*	$25,040
			% of Low Cost	103%

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

3" GRADE RAISE
6' UNDOWELLED JOINTS

4" GRADE RAISE
12' DOWELLED JOINTS

* Equivalent Annual Cost is included for informatic
12' DOWELLED JOINTS

SP 5512-08

Cost Analysis T.H. 247 From T.H. 63 to T.H. 42

Givens:

Length =	11.834	miles		
Width of Road =	24	feet(Conc.)	24 feet(Bit.)	9/10/12-TRM
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.5	%		
Inflation Rate =	0	%		

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

Item	Course	Unit	Price/Unit	Total Cost
2" MILL BITUMINOUS		SY	0.80	$133,298.18
PATCH		Ton	100.00	$47,336.00
TACK COAT		GAL	$1.00	$33,324.54
3.5" SPWEB340B	Wear	TON	55.00	$1,812,230.36
		Total Cost:		**$2,026,189**
		Cost/Mile:		**$171,218**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$171,218	1.000	$171,218	$7,398
Rout & seal	2	$2,000	0.952	$1,904	$82
Chipseal	4	$20,000	0.906	$18,119	$783
Mill & 3" Overlay	17	$149,341	0.657	$98,146	$4,240
Rout & seal	19	$2,000	0.626	$1,251	$54
Chipseal	21	$20,000	0.595	$11,908	$514
Mill & 3" Overlay	33	$149,341	0.443	$66,114	$2,856
Remaining Life Value	35	($129,429)	0.421	-$54,538	-$2,356
	Total Present Worth:			**$314,121**	$13,572
	Equivalent Annual Cost:			**$13,572**	$13,572

5.5" Whitetopping(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	1.25	$208,278.40
Conc Std Width 5.5		SY	5.00	$833,113.60
Structural Concrete		CY	68.50	$1,743,626.23
Reinforcement Bars	Epoxy	lb	0.80	$58,885.98
		Total Cost:		**$2,843,904**
		Cost/Mile:		**$240,316**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$240,316	1.000	$240,316	$10,383
Major CPR	20	$150,000	0.610	$91,541	$3,955
Remaining Life Value	35	$0	0.421	$0	$0
	Total Present Worth:			**$331,857**	$14,338
	Equivalent Annual Cost:			**$14,338**	$14,338

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

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	1.25	$208,278.40
PATCH		Ton	100.00	$47,336.00
TACK COAT		GAL	$1.00	$49,986.82
4.5" SPWEB340B	Wear	TON	55.00	$2,330,010.46
		Total Cost:		**$2,635,612**
		Cost/Mile:		**$222,715**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$222,715	1.000	$222,715	$9,623
Rout & seal	3	$2,000	0.929	$1,857	$80
Chipseal	5	$20,000	0.884	$17,677	$764
Mill & 3" Overlay	22	$149,341	0.581	$86,747	$3,748
Rout & seal	24	$2,000	0.553	$1,106	$48
Chipseal	26	$20,000	0.526	$10,525	$455
Remaining Life Value	35	($35,140)	0.421	-$14,807	-$640
	Total Present Worth:			**$325,820**	$14,077
	Equivalent Annual Cost:			**$14,077**	$14,077

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

District	4
Performed By	grgonlyConlcca
Analysis Period	35
Discount Rate	2.7

Project Number	
Date	
Funding Category	RD
Low Cost Option #	1
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
2" mill and 3.5" overlay					7" whitetopping					6" bituminous				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			13	BIT				20	PCC				20	BIT
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0			initial cost	$ 250,000	0			initial cost	$ 600,000	0				$ 500,000
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3				$ -	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6	AB		Surface Treatment	$ 25,000	6				$ -	6				$ -
7				$ -	7				$ -	7				$ -
8				$ -	8				$ -	8	AA		Crack Treatment	$ 10,000
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12				$ -	12				$ -	12	ab		Surface Treatment	$ 25,000
13	AK		3" Mill & 3" Overlay	$ 190,000	13	An		Reseal Joints (6'X6')	$ 100,000	13				$ -
14				$ -	14				$ -	14				$ -
15				$ -	15					15				$ -
16				$ -	16				$ -	16				$ -
17				$ -	17				$ -	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20				$ -	20				$ -	20	AH		2" Mill & 2" Overlay	$ 130,000
21				$ -	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23	BA		bit 7" mill pasb, fill	$ 400,000	23				$ -	23	aa		Crack Treatment	$ 10,000
24				$ -	24				$ -	24				$ -
25				$ -	25	as		Major CPR (15')	$ 250,000	25				$ -
26				$ -	26				$ -	26				$ -
27				$ -	27				$ -	27	ab		Surface Treatment	$ 25,000
28				$ -	28				$ -	28				$ -
29	AB		Surface Treatment	$ 25,000	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31				$ -	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34				$ -	34				$ -
35			Remaining Service Life Value**	$ (170,000)	35			Remaining Service Life Value**		35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 567,064				Total Present Worth	$ 799,161				Total Present Worth	$ 620,137
			Eq. Annual Cost*	$25,248				Eq. Annual Cost*	$35,582				Eq. Annual Cost*	$27,611
			% of Low Cost	100%				% of Low Cost	141%				% of Low Cost	109%

* Equivalent Annual Cost is included for information only.

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

District	4
Performed By	grgonlyConlcca
Analysis Period	35
Discount Rate	2.7

Project Number	
Date	
Funding Category	RD
Low Cost Option #	1
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
2" mill and 3.5" overlay					7" whitetopping					6" bituminous				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			13	BIT				20	PCC				20	BIT
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0			initial cost	$ 250,000	0			initial cost	$ 600,000	0				$ 500,000
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3				$ -	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6	AB		Surface Treatment	$ 25,000	6				$ -	6				$ -
7				$ -	7				$ -	7				$ -
8				$ -	8				$ -	8	AA		Crack Treatment	$ 10,000
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12				$ -	12				$ -	12	ab		Surface Treatment	$ 25,000
13	AK		3" Mill & 3" Overlay	$ 190,000	13	An		Reseal Joints (6'X6')	$ 100,000	13				$ -
14				$ -	14				$ -	14				$ -
15				$ -	15					15				$ -
16				$ -	16				$ -	16				$ -
17				$ -	17				$ -	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20				$ -	20				$ -	20	AH		2" Mill & 2" Overlay	$ 130,000
21				$ -	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23	BA		bit 7" mill pasb, fill	$ 400,000	23				$ -	23	aa		Crack Treatment	$ 10,000
24				$ -	24				$ -	24				$ -
25				$ -	25	AS		Major CPR (15')	$ 250,000	25				$ -
26				$ -	26				$ -	26				$ -
27				$ -	27				$ -	27	ab		Surface Treatment	$ 25,000
28				$ -	28				$ -	28				$ -
29	AB		Surface Treatment	$ 25,000	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31				$ -	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34				$ -	34				$ -
35			Remaining Service Life Value**	$ (170,000)	35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 567,064				Total Present Worth	$ 799,161				Total Present Worth	$ 620,137
			Eq. Annual Cost*	$25,248				Eq. Annual Cost*	$35,582				Eq. Annual Cost*	$27,611
			% of Low Cost	100%				% of Low Cost	141%				% of Low Cost	109%

* Equivalent Annual Cost is included for information only.

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

District	4
Performed By	SM
Analysis Period	35
Discount Rate	2.7

Project Number	5621-23
Date	
Funding Category	RS
Low Cost Option #	1
Chosen Option #	1

OPTION #1					OPTION #2				
DESCRIPTION					DESCRIPTION				
Mill 3", Pave 3"(SPWEB340B)					6" Whitetopping				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			17	BIT				17	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0			Initial Cost	$ 123,447	0			Initial Cost	$ 255,928
1				$ -	1				$ -
2				$ -	2				$ -
3	AA	3	Crack Treatment	$ 2,000	3				$ -
4				$ -	4				$ -
5				$ -	5				$ -
6	AB	14	Surface Treatment	$ 20,000	6				$ -
7				$ -	7				$ -
8				$ -	8				$ -
9				$ -	9				$ -
10				$ -	10				$ -
11				$ -	11				$ -
12				$ -	12				$ -
13				$ -	13				$ -
14				$ -	14				$ -
15				$ -	15				$ -
16				$ -	16				$ -
17	AK	16	3" Mill & 3" Overlay	$ 124,000	17	BA	9	Major CPR and Plane	$ 200,000
18				$ -	18				$ -
19				$ -	19				$ -
20				$ -	20				$ -
21				$ -	21				$ -
22				$ -	22				$ -
23	AA	3	Crack Treatment	$ 2,000	23				$ -
24				$ -	24				$ -
25				$ -	25				$ -
26	AB	9	Surface Treatment	$ 20,000	26	AE	15	3" Overlay	$ 106,000
27				$ -	27				$ -
28				$ -	28				$ -
29				$ -	29				$ -
30				$ -	30				$ -
31				$ -	31				$ -
32				$ -	32				$ -
33	AK	15	3" Mill & 3" Overlay	$ 124,000	33				$ -
34				$ -	34				$ -
35			Remaining Service Life Value**	$ (108,000)	35			Remaining Service Life Value**	$ (42,400)
			Total Present Worth	$ 241,231				Total Present Worth	$ 419,419
			Eq. Annual Cost*	$10,741				Eq. Annual Cost*	$18,674
			% of Low Cost	100%				% of Low Cost	174%

* Equivalent Annual Cost is included for information only.

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

SP 5901-25

District	8
Performed By	AAA
Analysis Period	35
Discount Rate	2.5

Project Number	SP 5901-25
Date	8/10/2012
Funding Category	RC
Low Cost Option #	1
Chosen Option #	1

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
3" Bituminous Mill & Overlay					6.5" Whitetopping Design, 28 ft Wide					7.5" Whitetopping Design, 24 ft Wide				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			15 Years	BIT				15 Years	PCC				15 Years	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0		15	3" Mill & Overlay	$ 134,957	0			6.5" 28' Width	$ 511,323	0			7.5" 24' Width	$ 535,451
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3	aa		Crack Treatment	$ 5,000	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5	bh		Chip Seal	$ 20,000	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7				$ -	7				$ -	7				$ -
8				$ -	8				$ -	8				$ -
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12				$ -	12	bb		1st CPR (28' Width)	$ 34,163	12	be		1st CPR (24' Width)	$ 23,426
13				$ -	13				$ -	13				$ -
14				$ -	14				$ -	14				$ -
15	ba		2" Mill & 3.5" Overlay	$ 179,861	15				$ -	15				$ -
16				$ -	16				$ -	16				$ -
17				$ -	17				$ -	17				$ -
18	aa		Crack Treatment	$ 5,000	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20	bh		Chip Seal	$ 20,000	20	bc		2nd CPR (28' Width)	$ 173,827	20	bf		2nd CPR (24' Width)	$ 124,377
21				$ -	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23				$ -	23				$ -	23				$ -
24				$ -	24				$ -	24				$ -
25				$ -	25				$ -	25				$ -
26				$ -	26				$ -	26				$ -
27				$ -	27				$ -	27				$ -
28	ba		2" Mill & 3.5" Overlay	$ 179,861	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30				$ -	30	bd		Remove & Replace (28' W)	$ 609,885	30	bg		Remove & Replace (24' W)	$ 619,931
31	aa		Crack Treatment	$ 5,000	31				$ -	31				$ -
32				$ -	32				$ -	32				$ -
33	bh		Chip Seal	$ 20,000	33				$ -	33				$ -
34				$ -	34				$ -	34				$ -
35			Remaining Service Life Value**	$ (96,848.21)	35			Remaining Service Life Value**	$ (385,370)	35			Remaining Service Life Value**	$ (377,041)
			Total Present Worth	$ 357,335				Total Present Worth	$ 771,181				Total Present Worth	$ 765,447
			Eq. Annual Cost*	$15,439				Eq. Annual Cost*	$33,319				Eq. Annual Cost*	$33,072
			% of Low Cost	100%				% of Low Cost	216%				% of Low Cost	214%

* Equivalent Annual Cost is included for information only.

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

SP 6510-64

District	8
Performed By	A. Ahmed
Analysis Period	35
Discount Rate	2.5

Project Number	6510-64
Date	7/26/2012
Funding Category	RC
Low Cost Option #	1
Chosen Option #	1

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
3" mill & 3" overlay					3" mill & 4.5" overlay					6.0 " Whitetopping				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			13 years	BIT				15 years	BIT				15 years	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0			Initial construction	$ 234,514	0			Initial Construction	$ 352,000	0			Initial Construction	$ 403,582
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3	AA		Crack Treatment	$ 5,000	3	AA		Crack Treatment	$ 5,000	3				$ -
4				$ -	4				$ -	4				$ -
5	AB		Surface Treatment	$ 20,000	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7				$ -	7	AB		Surface Treatment	$ 20,000	7				$ -
8				$ -	8				$ -	8				$ -
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12				$ -	12				$ -	12	BK		1st CPR 12' Jt @ 15 yr	$ 32,943
13	BG	12	3" Mill & OL w/o Shld	$ 127,917	13				$ -	13				$ -
14				$ -	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	18	AA		Crack Treatment	$ 5,000	18				$ -
19				$ -	19				$ -	19				$ -
20				$ -	20				$ -	20	BL		2nd CPR 12' Jt @ 15 yr	$ 167,619
21				$ -	21				$ -	21				$ -
22				$ -	22	AB		Surface Treatment	$ 20,000	22				$ -
23				$ -	23				$ -	23				$ -
24				$ -	24				$ -	24				$ -
25	AK	11	3" Mill & 3" Overlay	$ 234,514	25				$ -	25				$ -
26				$ -	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	BU		Whitetopping+PCC removal	$ 495,040
31				$ -	31				$ -	31				$ -
32				$ -	32	AA		Crack Treatment	$ 5,000	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34				$ -	34				$ -
35			Remaining Service Life Value**	$ (21,319)	35			Remaining Service Life Value**	$ (96,618)	35			Remaining Service Life Value**	$ (330,027)
			Total Present Worth	$ 495,370				Total Present Worth	$ 561,424				Total Present Worth	$ 627,313
			Eq. Annual Cost*	$21,403				Eq. Annual Cost*	$24,257				Eq. Annual Cost*	$27,103
			% of Low Cost	100%				% of Low Cost	113%				% of Low Cost	127%

* Equivalent Annual Cost is included for information only.

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

SP 6612-97

Cost Analysis/ TH 3(T.H. 21 to Northfield)

Givens:

Length =	15.12	miles		
Width of Road =	24	feet(Conc.)	24 feet(Bit.)	7/24/12-TRM
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.5	%		
Inflation Rate =	0	%		

MILL 1.5" & 3" min. Bituminous Overlay(15 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	0.80	$170,311.68
PATCH		Ton	100.00	$60,480.00
TACK COAT		GAL	$1.00	$42,577.92
3" SPWEB340B	Wear	TON	55.00	$1,984,663.30
		Total Cost:		**$2,258,033**
		Cost/Mile:		**$149,341**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$149,341	1.000	$149,341	$6,452
Rout & seal	2	$2,000	0.952	$1,904	$82
Chipseal	4	$20,000	0.906	$18,119	$783
Mill & 3" Overlay	17	$149,341	0.657	$98,146	$4,240
Rout & seal	19	$2,000	0.626	$1,251	$54
Chipseal	21	$20,000	0.595	$11,908	$514
Mill & 3" Overlay	33	$149,341	0.443	$66,114	$2,856
Remaining Life Value	35	($129,429)	0.421	-$54,538	-$2,356
	Total Present Worth:			**$292,245**	$12,627
	Equivalent Annual Cost:			**$12,627**	$12,627

7.5" Whitetopping(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	1.25	$266,112.00
Conc Std Width 7.5		SY	5.00	$1,064,448.00
Structural Concrete		CY	68.50	$3,038,112.00
Reinforcement Bars	Epoxy	lb	0.80	$75,237.12
Dowel Bars	Epoxy	each	$5.20	$664,215.55
		Total Cost:		**$5,108,125**
		Cost/Mile:		**$337,839**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$337,839	1.000	$337,839	$14,597
Minor CPR	20	$150,000	0.610	$91,541	$3,955
Remaining Life Value	35	$0	0.421	$0	$0
	Total Present Worth:			**$429,380**	$18,552
	Equivalent Annual Cost:			**$18,552**	$18,552

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

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	1.25	$266,112.00
PATCH		Ton	100.00	$60,480.00
TACK COAT		GAL	$1.00	$42,577.92
4.5" SPWEB340B	Wear	TON	55.00	$2,976,994.94
		Total Cost:		**$3,346,165**
		Cost/Mile:		**$221,307**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$221,307	1.000	$221,307	$9,562
Rout & seal	3	$2,000	0.929	$1,857	$80
Chipseal	5	$20,000	0.884	$17,677	$764
Mill & 3" Overlay	22	$149,341	0.581	$86,747	$3,748
Rout & seal	24	$2,000	0.553	$1,106	$48
Chipseal	26	$20,000	0.526	$10,525	$455
Remaining Life Value	35	($35,140)	0.421	-$14,807	-$640
	Total Present Worth:			**$324,412**	$14,016
	Equivalent Annual Cost:			**$14,016**	$14,016

1. Preventive Maintenance 2 years to medium and heavy overlays.
2. Each successive overlay has 1 year less life than previous one on a section.
3. Medium overlay-15 years, heavy bit. overlay-20 years, whitetopping-20 years.
5. Aggregate and shoulder quantities were not included in each option.
6. Calculations are based on 35 year life cycle.
7. Costs are based upon recent district project costs.
8. Miles increased to account for 4-lane section. Actual project length is 12.61 miles.

SP 6613-27

Cost Analysis/ TH 21 NB & SB From T.H. 60 to 1.7 Mi. N. T.H. 3

Givens:

Length =	5.596	miles		
Width of Road =	27	feet(Conc.)	24 feet(Bit.)	12/2/11-TRM
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.7	%		
Inflation Rate =	0	%		

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

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	$0.50	$39,395.84
PATCH		Ton	$100.00	$22,384.00
TACK COAT		GAL	$1.00	$15,758.34
3.5" SPWEB340B	Wear	TON	$50.00	$779,052.74
		Total Cost:		**$856,591**
		Cost/Mile:		**$153,072**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$153,072	1.000	$153,072	$6,815
Rout & seal	2	$2,000	0.948	$1,896	$84
Chipseal	4	$20,000	0.899	$17,978	$800
Mill & 3" Overlay	17	$133,184	0.636	$84,675	$3,770
Rout & seal	19	$2,000	0.603	$1,206	$54
Chipseal	21	$20,000	0.572	$11,430	$509
Mill & 3" Overlay	33	$133,184	0.415	$55,288	$2,462
Remaining Life Value	35	($115,426)	0.394	-$45,430	-$2,023
	Total Present Worth:			**$280,115**	$12,472
	Equivalent Annual Cost:			**$12,472**	$12,472

7" WHITETOPPING-doweled(20 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	$1.12	$99,277.52
Conc Std Width 7		SY	$5.00	$443,203.20
Structural Concrete		CY	$65.77	$1,133,525.90
Reinforcement Bars	Epoxy	lb	$0.80	$27,845.70
Dowel Bars	Epoxy	each	$5.20	$245,830.04
		Total Cost:		**$1,949,682**
		Cost/Mile:		**$348,406**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$348,406	1.000	$348,406	$15,512
Major CPR	23	$150,000	0.542	$81,278	$3,619
3.5" Bit. Overlay	33	$146,032	0.415	$60,621	$2,699
Remaining Life Value	35	($126,561)	0.394	-$49,812	-$2,218
	Total Present Worth:			**$440,493**	$19,612
	Equivalent Annual Cost:			**$19,612**	$19,612

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

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	$0.50	$39,395.84
PATCH		Ton	$100.00	$22,384.00
TACK COAT		GAL	$1.00	$23,637.50
4.5" SPWEB340B	Wear	TON	$50.00	$1,001,639.23
		Total Cost:		**$1,087,057**
		Cost/Mile:		**$194,256**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$194,256	1.000	$194,256	$8,649
Rout & seal	2	$2,000	0.948	$1,896	$84
Chipseal	4	$20,000	0.899	$17,978	$800
Mill & 3" Overlay	22	$133,184	0.556	$74,114	$3,300
Rout & seal	24	$2,000	0.528	$1,055	$47
Chipseal	26	$20,000	0.500	$10,005	$445
Remaining Life Value	35	($31,337)	0.394	-$12,334	-$549
	Total Present Worth:			**$286,971**	$12,777
	Equivalent Annual Cost:			**$12,777**	$12,777

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 -20 years, whitetopping-20 years.
4. Aggregate and shoulder quantities were not included in each option.
5. Calculations are based on 35 year life cycle.
6. Costs are based upon recent district project costs.
7. No chipseal on the bituminous overlay over whitetopping.

District	7
Performed By	Kyle Vogt
Analysis Period	35
Discount Rate	2.5

Project Number	6780-101
Date	12/11/2012
Funding Category	1
Low Cost Option #	3
Chosen Option #	

District	7
Performed By	Kyle Vogt
Analysis Period	35
Discount Rate	2.5

Project Number	6780-101
Date	12/11/2012
Funding Category	3
Low Cost Option #	1/3/1900
Chosen Option #	

OPTION #1

DESCRIPTION: 4.5" Bit. Thick Overlay

DESIGN LIFE	TYPE
14	2

Year	#	Life	Description	Cost/Mile
0		14	4.5" Bit. Thick Overlay	$ 469,307
1				$ -
2				$ -
3	AA		Crack Treatment	$ 3,000
4				$ -
5				$ -
6				$ -
7	AB		Surface Treatment	$ 20,000
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14	AJ	13	2" Mill & 3.5" Overlay	$ 198,212
15				$ -
16				$ -
17	AA		Crack Treatment	$ 3,000
18				$ -
19				$ -
20				$ -
21	AB		Surface Treatment	$ 20,000
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	AJ	12	2" Mill & 3.5" Overlay	$ 198,212
28				$ -
29				$ -
30	AA		Crack Treatment	$ 3,000
31				$ -
32				$ -
33				$ -
34	AB		Surface Treatment	$ 20,000
35			Remaining Service Life (4/12)	$ (66,070.65)
			Total Present Worth	$ 727,068
			Eq. Annual Cost*	$31,413
			% of Low Cost	100%

OPTION #2 PCC

DESCRIPTION: 5" Unbonded Overlay (6' x 6' panels)

DESIGN LIFE	TYPE
20	1

Year	#	Life	Description	Cost/Mile
0			5" Unbonded Concrete Overlay	$ 560,583
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13	BB		Reseal Joints & Partial Depth Re	$ 70,991
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	BC		Major CPR	$ 332,833
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			No remaining service life	$ -
			Total Present Worth	$ 791,608
			Eq. Annual Cost*	$34,202
			% of Low Cost	109%

OPTION #3

DESCRIPTION: 4.5" Bit. Thick Overlay with Reclaimed Shoulders

DESIGN LIFE	TYPE
14	2

Year	#	Life	Description	Cost/Mile
0		14	4.5" Bit. Overlay w/ Reclaim	$ 467,567
1				$ -
2				$ -
3	AA		Crack Treatment	$ 3,000
4				$ -
5				$ -
6				$ -
7	AB		Surface Treatment	$ 20,000
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14	AJ	13	2" Mill & 3.5" Overlay	$ 198,212
15				$ -
16				$ -
17	AA		Crack Treatment	$ 3,000
18				$ -
19				$ -
20				$ -
21	AB		Surface Treatment	$ 20,000
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	AJ	12	2" Mill & 3.5" Overlay	$ 198,212
28				$ -
29				$ -
30	AA		Crack Treatment	$ 3,000
31				$ -
32				$ -
33				$ -
34	AB		Surface Treatment	$ 20,000
35			Remaining Service Life (4/12)	$ (66,070.65)
			Total Present Worth	$ 725,328
			Eq. Annual Cost*	$31,338
			% of Low Cost	100%

OPTION #4 PCC

DESCRIPTION: 7" Full Bituminous Reconstruction

DESIGN LIFE	TYPE
20	1

Year	#	Life	Description	Cost/Mile
0		20	7" Full Bit. Reconstruction	$ 1,914,051
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8	AA		Crack Treatment	$ 3,000
9				$ -
10				$ -
11				$ -
12	AB		Surface Treatment	$ 20,000
13				$ -
14				$ -
15				$ -
16				$ -
17	BF		2nd CPR (35 yr)	$ 194,985
18				$ -
19				$ -
20	AJ	15	2" Mill & 3.5" Overlay	$ 198,212
21				$ -
22				$ -
23	AA		Crack Treatment	$ 3,000
24				$ -
25				$ -
26				$ -
27	AB		Surface Treatment	$ 20,000
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			No remaining service life	$ -
			Total Present Worth	$ 2,192,459
			Eq. Annual Cost*	$94,726
			% of Low Cost	302%

OPTION #5 PCC

DESCRIPTION: 6" Unbonded Overlay (12' panels)

DESIGN LIFE	TYPE
35	

Year	#	Life	Description	Cost/Mile
0				$ 689,243
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	be		1st CPR (35 yr)	$ 21,319
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	BF		2nd CPR (35 yr)	$ 194,985
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life (5/13)	$ (74,994.28)
			Total Present Worth	$ 771,758
			Eq. Annual Cost*	$33,344
			% of Low Cost	106%

* Equivalent Annual Cost is included for information only.

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

This design falls below the minimum pavement thickness and will not be used.

Added 1/15/2013

SP 6809-16

District	2
Performed By	K.Olson
Analysis Period	35
Discount Rate	2.5

Project Number	6809-16
Date	8/20/2012
Funding Category	RS
Low Cost Option #	
Chosen Option #	

OPTION #1					OPTION #2				
DESCRIPTION					DESCRIPTION				
3.0" mill,9" reclaim 4.5" bit					2" mill, 5" whitetopping				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			20	BIT				20	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0				$ 295,746	0				$ 531,626
1				$ -	1				$ -
2				$ -	2				$ -
3				$ -	3				$ -
4				$ -	4				$ -
5				$ -	5				$ -
6				$ -	6				$ -
7				$ -	7				$ -
8	AA		Crack Treatment	$ 5,000	8				$ -
9				$ -	9				$ -
10				$ -	10				$ -
11				$ -	11				$ -
12	AB		Surface Treatment	$ 23,000	12				$ -
13				$ -	13	AN		Reseal Joints (6'X7')	$ 97,945
14				$ -	14				$ -
15				$ -	15				$ -
16				$ -	16				$ -
17				$ -	17				$ -
18				$ -	18				$ -
19				$ -	19				$ -
20	AH	15	2" Mill & 2" Overlay	$ 117,258	20				$ -
21				$ -	21				$ -
22				$ -	22				$ -
23	AA		Crack Treatment	$ 5,000	23				$ -
24				$ -	24				$ -
25				$ -	25	AT		Major CPR(6x7)	$ 271,098
26				$ -	26				$ -
27	AB		Surface Treatment	$ 23,000	27				$ -
28				$ -	28				$ -
29				$ -	29				$ -
30				$ -	30				$ -
31				$ -	31				$ -
32				$ -	32				$ -
33				$ -	33				$ -
34				$ -	34				$ -
35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 403,152				Total Present Worth	$ 748,905
			Eq. Annual Cost*	$17,418				Eq. Annual Cost*	$32,357
			% of Low Cost	100%				% of Low Cost	186%

* Equivalent Annual Cost is included for information only.

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

2.5" GRADE RAISE

6' UNDOWELLED JOINTS

District	1
Performed By	D. Fredrickson
Analysis Period	35
Discount Rate	2.7

Project Number	6904-47
Date	2/2/2012
Funding Category	RS
Low Cost Option #	1
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
7.0" Concrete + 6" agg base and 12" Sel Gran					5" HMA + 6" agg base and 23" Sel Gran					3" Mill and 3" Inlay				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			20	PCC				20	BIT				11	BIT
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0				$ 360,666	0				$ 409,790	0				$ 180,646
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3				$ -	3				$ -	3	bb		Crack Seal	$ 2,200
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7				$ -	7				$ -	7				$ -
8				$ -	8	bf		50% of Crack Treatment	$ 2,500	8				$ -
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11	ak	10	3" Mill & 3" Overlay	$ 180,646
12				$ -	12	ab		Surface Treatment	$ 20,000	12				$ -
13	ao		Reseal Joints (15')	$ 9,572	13				$ -	13				$ -
14				$ -	14				$ -	14	bb		Crack Seal	$ 2,200
15				$ -	15				$ -	15				$ -
16				$ -	16				$ -	16				$ -
17				$ -	17				$ -	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20				$ -	20	ah		2" Mill & 2" Overlay	$ 120,666	20				$ -
21				$ -	21				$ -	21	ak	9	3" Mill & 3" Overlay	$ 180,646
22				$ -	22				$ -	22				$ -
23				$ -	23	aa		Crack Treatment	$ 5,000	23				$ -
24				$ -	24				$ -	24	bb		Crack Seal	$ 2,200
25	as		Major CPR (15')	$ 179,611	25				$ -	25				$ -
26				$ -	26				$ -	26				$ -
27				$ -	27	ab		Surface Treatment	$ 20,000	27				$ -
28				$ -	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30				$ -	30				$ -	30	ak	8	3" Mill & 3" Overlay	$ 180,646
31				$ -	31				$ -	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33	bb		Crack Seal	$ 2,200
34				$ -	34				$ -	34				$ -
35			Remaining Service Life Value**	$ (1)	35			Remaining Service Life Value**	$ (1)	35			Remaining Service Life Value**	$ (67,742)
			Total Present Worth	$ 459,708				Total Present Worth	$ 509,611				Total Present Worth	$ 478,832
			Eq. Annual Cost*	$20,468				Eq. Annual Cost*	$22,690				Eq. Annual Cost*	$21,319
			% of Low Cost	100%				% of Low Cost	111%				% of Low Cost	104%

* Equivalent Annual Cost is included for information only.

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

District	1
Performed By	CM/SH
Analysis Period	35
Discount Rate	2.5

Project Number	SP 6904-49
Date	4/8/2013
Funding Category	RC
Low Cost Option #	2
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
3" Mill 9" Reclaim 5" Bituminous					3" Mill & 3" Overlay					FDR and 6"x6'x6' PCC Overlay				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			20	BIT				16	BIT				20	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0	BM		3" Mill 9" Reclaim 5" Bituminous	$ 151,360	0	AK		3" Mill & 3" Overlay	$ 82,000	0	BN		FDR and 6"x6'x6' PCC Overlay	$ 152,000
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3				$ -	3	AA		Crack Treatment	$ 1,100	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7				$ -	7	AB		Surface Treatment	$ 9,500	7				$ -
8	AA		Crack Treatment	$ 1,100	8				$ -	8				$ -
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12	AB		Surface Treatment	$ 9,500	12				$ -	12				$ -
13				$ -	13				$ -	13	AN		Reseal Joints (6'X6')	$ 56,000
14				$ -	14				$ -	14				$ -
15				$ -	15				$ -	15				$ -
16				$ -	16	BG		2nd 2" Mill & 2" Overlay	$ 54,912	16				$ -
17				$ -	17				$ -	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19	AA		Crack Treatment	$ 1,100	19				$ -
20	AH		2" Mill & 2" Overlay	$ 54,912	20				$ -	20				$ -
21				$ -	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23	AA		Crack Treatment	$ 1,100	23	AB		Surface Treatment	$ 9,500	23				$ -
24				$ -	24				$ -	24				$ -
25				$ -	25				$ -	25	AR		Major CPR (6'X6')	$ 119,000
26				$ -	26				$ -	26				$ -
27	AB		Surface Treatment	$ 9,500	27				$ -	27				$ -
28				$ -	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31	BG		2nd 2" Mill & 2" Overlay	$ 54,912	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34	AA		Crack Treatment	$ 1,100	34				$ -
35	AH	0%	Remaining Service Life Value**	$ -	35	BG	71%	Remaining Service Life Value**	$ (38,988)	35	AQ	0%	Remaining Service Life Value**	$ -
			Total Present Worth	$ 198,338				Total Present Worth	$ 143,663				Total Present Worth	$ 256,811
			Eq. Annual Cost*	$8,569				Eq. Annual Cost*	$6,207				Eq. Annual Cost*	$11,096
			% of Low Cost	138%				% of Low Cost	100%				% of Low Cost	179%

* Equivalent Annual Cost is included for information only.

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

District	1
Performed By	CM/SH
Analysis Period	35
Discount Rate	2.5

Project Number	SP 6904-49
Date	4/8/2013
Funding Category	RC
Low Cost Option #	1
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
3" Mill 9" Reclaim 5" Bituminous					4" Mill 6" PCC Pavement					FDR and 6"x6'x6' PCC Pavement				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			20	BIT				35	PCC				20	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0	BM		3" Mill 9" Reclaim 5" Bituminous	$ 151,360	0	BN		4" Mill 6" PCC Pavement	$ 179,168	0	BP		FDR and 6"x6'x6' PCC Pavement	$ 152,000
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3				$ -	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7				$ -	7				$ -	7				$ -
8	AA		Crack Treatment	$ 1,100	8				$ -	8				$ -
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12	AB		Surface Treatment	$ 9,500	12				$ -	12				$ -
13				$ -	13				$ -	13	AN		Reseal Joints (6'X6')	$ 59,000
14				$ -	14				$ -	14				$ -
15				$ -	15				$ -	15				$ -
16				$ -	16				$ -	16				$ -
17				$ -	17	AO		Reseal Joints (15')	$ 10,000	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20	AH		2" Mill & 2" Overlay	$ 54,912	20				$ -	20				$ -
21				$ -	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23	AA		Crack Treatment	$ 1,100	23				$ -	23				$ -
24				$ -	24				$ -	24				$ -
25				$ -	25				$ -	25	AR		Major CPR (6'X6')	$ 119,000
26				$ -	26				$ -	26				$ -
27	AB		Surface Treatment	$ 9,500	27	AQ		Minor CPR (15')	$ 125,000	27				$ -
28				$ -	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31				$ -	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34				$ -	34				$ -
35	AH	0%	Remaining Service Life Value**	$ -	35	AQ	38%	Remaining Service Life Value**	$ (48,077)	35	AQ	0%	Remaining Service Life Value**	$ -
			Total Present Worth	$ 198,338				Total Present Worth	$ 229,657				Total Present Worth	$ 258,987
			Eq. Annual Cost*	$8,569				Eq. Annual Cost*	$9,922				Eq. Annual Cost*	$11,190
			% of Low Cost	100%				% of Low Cost	116%				% of Low Cost	131%

* Equivalent Annual Cost is included for information only.

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

SP 6911-38

District	1
Performed By	CM
Analysis Period	35
Discount Rate	2.5

Project Number	SP 6911-38
Date	3/28/2013
Funding Category	RC
Low Cost Option #	2
Chosen Option #	

District	1
Performed By	CM
Analysis Period	35
Discount Rate	2.5

OPTION #1

DESCRIPTION: FDR & 6" Bituminous

DESIGN LIFE: 20 **TYPE**: BIT

Year	#	Life	Description	Cost/Mile
0	BH		FDR & 6" Bituminous	$ 160,000
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8	AA		Crack Treatment	$ 1,100
9				$ -
10				$ -
11				$ -
12	AB		Surface Treatment	$ 9,500
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	AH		2" Mill & 2" Overlay	$ 55,000
21				$ -
22				$ -
23	AA		Crack Treatment	$ 1,100
24				$ -
25				$ -
26				$ -
27	AB		Surface Treatment	$ 9,500
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35	AH	0%	Remaining Service Life Value**	$ -
			Total Present Worth	$ 207,032
			Eq. Annual Cost*	$8,945
			% of Low Cost	144%

OPTION #2

DESCRIPTION: 3" Mill & 3" Overlay

DESIGN LIFE: 16 **TYPE**: BIT

Year	#	Life	Description	Cost/Mile
0	AK		3" Mill & 3" Overlay	$ 82,000
1				$ -
2				$ -
3	AA		Crack Treatment	$ 1,100
4				$ -
5				$ -
6				$ -
7	AB		Surface Treatment	$ 9,500
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16	BG		2nd 2" Mill & 2" Overlay	$ 55,000
17				$ -
18				$ -
19	AA		Crack Treatment	$ 1,100
20				$ -
21				$ -
22				$ -
23	AB		Surface Treatment	$ 9,500
24				$ -
25				$ -
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31	BG		2nd 2" Mill & 2" Overlay	$ 55,000
32				$ -
33				$ -
34	AA		Crack Treatment	$ 1,100
35	BG	71%	Remaining Service Life Value**	$ (39,050)
			Total Present Worth	$ 143,736
			Eq. Annual Cost*	$6,210
			% of Low Cost	100%

OPTION #3

DESCRIPTION: 6"x12'x12' PCC Overlay (whitetopping)

DESIGN LIFE: 35 **TYPE**: PCC

Year	#	Life	Description	Cost/Mile
0	BK		6"x12'x12' PCC Overlay (whiteto	$ 156,000
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	AO		Reseal Joints (12')	$ 18,000
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	AQ		Minor CPR (12')	$ 92,000
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35	AQ	38%	Remaining Service Life Value**	$ (35,385)
			Total Present Worth	$ 200,152
			Eq. Annual Cost*	$8,648
			% of Low Cost	139%

OPTION #4

DESCRIPTION: FDR and 6"x6'x6' PCC Pavement

DESIGN LIFE: 20 **TYPE**: PCC

Year	#	Life	Description	Cost/Mile
0	BJ		FDR and 6"x6'x6' PCC Pavemen	$ 152,000
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13	AN		Reseal Joints (6'X6')	$ 59,000
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	AR		Major CPR (6'X6')	$ 119,000
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35	AQ	0%	Remaining Service Life Value**	$ -
			Total Present Worth	$ 258,987
			Eq. Annual Cost*	$11,190
			% of Low Cost	180%

* Equivalent Annual Cost is included for information only.

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

* Equivalent Annual Cost is included for informatic

District	1
Performed By	CM/SH
Analysis Period	35
Discount Rate	2.5

Project Number	SP 6928-28
Date	4/8//2013
Funding Category	RC
Low Cost Option #	2
Chosen Option #	

OPTION #1

DESCRIPTION	DESIGN LIFE	TYPE
9" FDR and 5" Bituminous	20	BIT

Year	#	Life	Description	Cost/Mile
0	BL		9" FDR and 5" Bituminous	$ 135,000
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8	AA		Crack Treatment	$ 1,100
9				$ -
10				$ -
11				$ -
12	AB		Surface Treatment	$ 9,500
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	AH		2" Mill & 2" Overlay	$ 55,000
21				$ -
22				$ -
23	AA		Crack Treatment	$ 1,100
24				$ -
25				$ -
26				$ -
27	AB		Surface Treatment	$ 9,500
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35	AH	0%	Remaining Service Life Value**	$ -
			Total Present Worth	$ 182,032
			Eq. Annual Cost*	$7,865
			% of Low Cost	129%

OPTION #2

DESCRIPTION	DESIGN LIFE	TYPE
1.5" Mill & 3" Overlay	16	BIT

Year	#	Life	Description	Cost/Mile
0	AI		1.5" Mill & 3" Overlay	$ 79,000
1				$ -
2				$ -
3	AA		Crack Treatment	$ 1,100
4				$ -
5				$ -
6				$ -
7	AB		Surface Treatment	$ 9,500
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16	BG		2nd 2" Mill & 2" Overlay	$ 55,000
17				$ -
18				$ -
19	AA		Crack Treatment	$ 1,100
20				$ -
21				$ -
22				$ -
23	AB		Surface Treatment	$ 9,500
24				$ -
25				$ -
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31	BG		2nd 2" Mill & 2" Overlay	$ 55,000
32				$ -
33				$ -
34	AA		Crack Treatment	$ 1,100
35	BG	71%	Remaining Service Life Value**	$ (39,050)
			Total Present Worth	$ 140,736
			Eq. Annual Cost*	$6,081
			% of Low Cost	100%

OPTION #3

DESCRIPTION	DESIGN LIFE	TYPE
9" FDR and 6"x6'x6' PCC Pavement	20	PCC

Year	#	Life	Description	Cost/Mile
0	BM		9" FDR and 6"x6'x6' PCC Pavement	$ 152,000
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13	AN		Reseal Joints (6'X6')	$ 59,000
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	AR		Major CPR (6'X6')	$ 119,000
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35	AR	0%	Remaining Service Life Value**	$ -
			Total Present Worth	$ 258,987
			Eq. Annual Cost*	$11,190
			% of Low Cost	184%

* Equivalent Annual Cost is included for information only.

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

District	1
Performed By	CM/SH
Analysis Period	35
Discount Rate	2.5

Project Number	6934-115
Date	1/7/2013
Funding Category	RC
Low Cost Option #	2
Chosen Option #	2

District	1
Performed By	CM/SH
Analysis Period	35
Discount Rate	2.5

OPTION #1

DESCRIPTION	DESIGN LIFE	TYPE
Reconstruction Bituminous	20	BIT

Year	#	Life	Description	Cost/Mile
0				$ 388,899
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6	AA		Crack Treatment	$ 2,200
7				$ -
8				$ -
9				$ -
10	BF		Microsurface	$ 54,000
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	BB		Medium Mill and Overlay - 2/4.5"	$ 207,962
21				$ -
22				$ -
23	AA		Crack Treatment	$ 2,200
24				$ -
25				$ -
26				$ -
27	BF		Microsurface	$ 54,000
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 588,864
			Eq. Annual Cost*	$25,442
			% of Low Cost	124%

OPTION #2

DESCRIPTION	DESIGN LIFE	TYPE
Thick Bituminous Overlay	19	BIT

Year	#	Life	Description	Cost/Mile
0				$ 152,186
1				$ -
2				$ -
3	AA		Crack Treatment	$ 2,200
4				$ -
5				$ -
6				$ -
7	BF		Microsurface	$ 54,000
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13	AD		2" Overlay	$ 160,301
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19	BA		Thin Mill and Overlay - 1.5/3"	$ 137,280
20				$ -
21				$ -
22	AA		Crack Treatment	$ 2,200
23				$ -
24				$ -
25				$ -
26	BA		Thin Mill and Overlay - 1.5/3"	$ 137,280
27				$ -
28				$ -
29	AA		Crack Treatment	$ 2,200
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 476,410
			Eq. Annual Cost*	$20,584
			% of Low Cost	100%

OPTION #3

DESCRIPTION	DESIGN LIFE	TYPE
Unbonded PCC Overlay	35	PCC

Year	#	Life	Description	Cost/Mile
0				$ 587,671
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	AQ		Minor CPR (15')	$ 212,183
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	AQ		Minor CPR (15')	$ 212,183
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 836,051
			Eq. Annual Cost*	$36,122
			% of Low Cost	175%

OPTION #4

DESCRIPTION	DESIGN LIFE	TYPE
Reconstruction PCC	35	PCC

Year	#	Life	Description	Cost/Mile
0				$ 646,944
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	AQ		Minor CPR (15')	$ 212,183
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	AQ		Minor CPR (15')	$ 212,183
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 895,324
			Eq. Annual Cost*	$38,683
			% of Low Cost	188%

* Equivalent Annual Cost is included for information only.

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

* Equivalent Annual Cost is included for informatio

District	Metro
Performed By	Jon Re
Analysis Period	35
Discount Rate	2.5

Project Number	7080-51, I35
Date	1/14/2013
Funding Category	RD
Low Cost Option #	2
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
Rubberlization & 9.5" Bit					UBCO 10"					UBCO 8"				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			20	BIT				35	PCC				20	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0			Rubberlization & 9.5" Bit	$ 566,745	0			UBCO 10"	$ 633,655	0			UBCO 8"	$ 591,923
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3				$ -	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7				$ -	7				$ -	7				$ -
8	BC		Light Crack Treatment	$ 2,375	8				$ -	8				$ -
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12	BD		Chip Seal	$ 32,000	12				$ -	12				$ -
13				$ -	13				$ -	13	BE		Reseal Joints (8" UBCO)	$ 64,112
14				$ -	14				$ -	14				$ -
15				$ -	15				$ -	15				$ -
16				$ -	16				$ -	16				$ -
17				$ -	17	BF		Reseal Joints (10" UBCO)	$ 48,952	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20	AK		3" Mill & 3" Overlay	$ 197,811	20				$ -	20				$ -
21				$ -	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23	AA		Crack Treatment	$ 4,750	23				$ -	23				$ -
24				$ -	24				$ -	24				$ -
25				$ -	25				$ -	25	BG		Major CPR (8" UBCO)	$ 166,075
26				$ -	26				$ -	26				$ -
27	BD		Chip Seal	$ 32,000	27	BH		Minor CPR (10" UBCO)	$ 113,875	27				$ -
28				$ -	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31				$ -	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34				$ -	34				$ -
35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ (43,798.09)	35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 732,327				Total Present Worth	$ 705,835				Total Present Worth	$ 728,010
			Eq. Annual Cost*	$31,641				Eq. Annual Cost*	$30,496				Eq. Annual Cost*	$31,454
			% of Low Cost	104%				% of Low Cost	100%				% of Low Cost	103%

* Equivalent Annual Cost is included for information only.

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

District		Metro	
Performed By	RD	Jon Re	
Analysis Period		35	
Discount Rate		2.5	

Project Number	7101-61, TH10
Date	1/14/2013
Funding Category	4
Low Cost Option #	1
Chosen Option #	

RD

BIT		PCC	OPTION #1		PCC			OPTION #2		PCC			OPTION #3	
DESCRIPTION					DESCRIPTION					DESCRIPTION				
2.5" Mill & 4.0" Overlay					4" Mill & 8" Concrete Whitetopping					Mill 2", FDR 9", 7" Bit Overlay				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			14	1				20	2				20	3
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0			2.5" Mill & 4.0" Overlay	$ 206,274	0			4" Mill & 8" Concrete Whitetoppin	$ 510,975	0			Mill 2", FDR 9", 7" Bit Overlay	$ 548,816
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3	AA		Crack Treatment	$ 4,625	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7	BE		Chip Seal	$ 30,833	7				$ -	7				$ -
8				$ -	8				$ -	8	BC		Light Crack Treatment	$ 2,312
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12				$ -	12				$ -	12	BE		Chip Seal	$ 30,833
13				$ -	13	AQ		Minor CPR (15')	$ 64,112	13				$ -
14	BA		3.5" M&O	$ 221,849	14				$ -	14				$ -
15				$ -	15				$ -	15				$ -
16				$ -	16				$ -	16				$ -
17	AA		Crack Treatment	$ 4,625	17				$ -	17				$ -
18				$ -	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20				$ -	20				$ -	20	AK		3" Mill & 3" Overlay	$ 192,606
21	BE		Chip Seal	$ 30,833	21				$ -	21				$ -
22				$ -	22				$ -	22				$ -
23				$ -	23				$ -	23	AA		Crack Treatment	$ 4,625
24				$ -	24				$ -	24				$ -
25				$ -	25	AS		Major CPR (15')	$ 165,949	25				$ -
26				$ -	26				$ -	26				$ -
27	BB		4" M&O	$ 251,526	27				$ -	27	BE		Chip Seal	$ 30,833
28				$ -	28				$ -	28				$ -
29				$ -	29				$ -	29				$ -
30	AA		Crack Treatment	$ 4,625	30				$ -	30				$ -
31				$ -	31				$ -	31				$ -
32				$ -	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34	BE		Chip Seal	$ 30,833	34				$ -	34				$ -
35			Remaining Service Life Value**	$ (83,841.86)	35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 524,239				Total Present Worth	$ 646,994				Total Present Worth	$ 709,632
			Eq. Annual Cost*	$22,650				Eq. Annual Cost*	$27,954				Eq. Annual Cost*	$30,660
			% of Low Cost	100%				% of Low Cost	123%				% of Low Cost	135%

District	3 - Baxter
Performed By	D. Nelson
Analysis Period	35
Discount Rate	2.5

Project Number	7106-78 TH 169
Date	7/31/2012
Funding Category	RS
Low Cost Option #	1
Chosen Option #	1

OPTION #1

DESCRIPTION: 3.0" Mill and Fill, ML & TL Only

DESIGN LIFE: 15 Years — TYPE: BIT

Year	#	Life	Description	Cost/Mile
0	BC		3.0" Mill & Fill - ML Only	$ 153,212
1				$ -
2				$ -
3				$ -
4	AA		Crack Treatment	$ 5,000
5				$ -
6				$ -
7				$ -
8	AC		Micro Surface	$ 45,000
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15	BD		1.5" ML Mill & Fill, 1.5" OL	$ 162,393
16				$ -
17				$ -
18				$ -
19	AA		Crack Treatment	$ 5,000
20				$ -
21				$ -
22				$ -
23	AC		Micro Surface	$ 45,000
24				$ -
25				$ -
26				$ -
27				$ -
28				$ -
29	BC		3.0" Mill & Fill - ML Only	$ 153,212
30				$ -
31				$ -
32				$ -
33	AA		Crack Treatment	$ 5,000
34				$ -
35			Remaining Service Life Value**	$ (82,498.77)
			Total Present Worth	$ 377,751
			Eq. Annual Cost*	$16,321
			% of Low Cost	100%

OPTION #2

DESCRIPTION: 7.5" Concrete Whitetopping ML, 3" Bit Shldrs

DESIGN LIFE: 15 Years — TYPE: PCC

Year	#	Life	Description	Cost/Mile
0	AX		7.5" Concrete Whitetopping	$ 317,339
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15	AR		Major CPR (6'X6')	$ 150,000
16				$ -
17				$ -
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	BF		Rem and Rep Conc Surf	$ 407,679
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (135,893.00)
			Total Present Worth	$ 583,546
			Eq. Annual Cost*	$25,212
			% of Low Cost	154%

OPTION #3

DESCRIPTION: 2" Mill and Fill ML & TL Only

DESIGN LIFE: 10 Years — TYPE: BIT

Year	#	Life	Description	Cost/Mile
0	BA		2.0" Mill & Fill, ML & TL Only	$ 106,650
1				$ -
2				$ -
3	AA		Crack Treatment	$ 5,000
4				$ -
5				$ -
6	AC		Micro Surface	$ 45,000
7				$ -
8				$ -
9				$ -
10	BB		2" ML & TL Mill, 1.5" OL Full Wid	$ 189,172
11				$ -
12				$ -
13				$ -
14	AA		Crack Treatment	$ 5,000
15				$ -
16				$ -
17				$ -
18	AC		Micro Surface	$ 45,000
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	BC		3.0" Mill & Fill - ML Only	$ 153,212
26				$ -
27				$ -
28				$ -
29	AA		Crack Treatment	$ 5,000
30				$ -
31				$ -
32				$ -
33	AC		Micro Surface	$ 45,000
34				$ -
35			Remaining Service Life Value**	$ (43,774.86)
			Total Present Worth	$ 416,829
			Eq. Annual Cost*	$18,009
			% of Low Cost	110%

* Equivalent Annual Cost is included for information only.

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

SP 7201-44

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

Project Number	7201-44
Date	3/15/2012
Funding Category	
Low Cost Option #	1
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
Bituminous Mill and Overlay					Concrete Reconstruction					Bituminous Reconstruction				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			15	Bit				20	PCC				20	BIT
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0			Initial Construction	$ 147,705	0			Initial Construction	$ 753,687	0			Initial Construction	$ 364,780
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3	AA		Crack Treatment	$ 5,000	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7	BB		Chip Seal	$ 20,000	7				$ -	7				$ -
8				$ -	8				$ -	8	BA		Light Crack Treatment	$ 2,500
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12				$ -	12				$ -	12	BB		Chip Seal	$ 20,000
13				$ -	13	BE		Minor CPR	$ 27,331	13				$ -
14				$ -	14				$ -	14				$ -
15	BD		2" Mill & 3.5" Overlay	$ 177,273	15				$ -	15				$ -
16				$ -	16				$ -	16				$ -
17				$ -	17				$ -	17				$ -
18	AA		Crack Treatment	$ 5,000	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20				$ -	20				$ -	20	BC		2" Mill & 4" Overlay	$ 180,425
21				$ -	21				$ -	21				$ -
22	BB		Chip Seal	$ 20,000	22				$ -	22				$ -
23				$ -	23				$ -	23	AA		Crack Treatment	$ 5,000
24				$ -	24				$ -	24				$ -
25				$ -	25	BF		1st Major CPR	$ 74,649	25				$ -
26				$ -	26				$ -	26				$ -
27				$ -	27				$ -	27	BB		Chip Seal	$ 20,000
28				$ -	28				$ -	28				$ -
29	BD		2" Mill & 3.5" Overlay	$ 177,273	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31				$ -	31				$ -
32	AA		Crack Treatment	$ 5,000	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34				$ -	34				$ -
35			Remaining Service Life Value**	$ (95,454.78)	35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ -
				$ -					$ -					$ -
				$ -					$ -					$ -
				$ -					$ -					$ -
				$ -					$ -					$ -
				$ -					$ -					$ -
				$ -					$ -					$ -
				$ -					$ -					$ -
				$ -					$ -					$ -
				$ -					$ -					$ -
				$ -					$ -					$ -
				$ -					$ -					$ -
				$ -					$ -					$ -
				$ -					$ -					$ -
				$ -					$ -					$ -
				$ -					$ -					$ -
				$ -					$ -					$ -
			Total Present Worth	$ 348,445				Total Present Worth	$ 811,367				Total Present Worth	$ 499,677
			Eq. Annual Cost*	$9,956				Eq. Annual Cost*	$23,182				Eq. Annual Cost*	$14,276
			% of Low Cost	100%				% of Low Cost	233%				% of Low Cost	143%

* Equivalent Annual Cost is included for information only.

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

SP 7201-112

District	7
Performed By	DV
Analysis Period	35
Discount Rate	2.5

Project Number	7201-112
Date	1/7/2013
Funding Category	RS
Low Cost Option #	5
Chosen Option #	1 and 5

District	7
Performed By	DV
Analysis Period	35
Discount Rate	2.5

Project Number	7201-112
Date	1/7/2013
Funding Category	RS
Low Cost Option #	1 and 5
Chosen Option #	1 and 5

OPTION #1				
DESCRIPTION				
4" mill / 7" WT (28 ft width)				
DESIGN LIFE			TYPE	
35			PCC	
Year	#	Life	Description	Cost/Mile
0			OPTION #1 - Initial Const	$ 344,521
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	AO		Reseal Joints (15')	$ 57,111
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	AQ		Minor CPR (15')	$ 130,791
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (50,304)
			Total Present Worth	$ 428,005
			Eq. Annual Cost*	$18,492
			% of Low Cost	103%

OPTION #2				
DESCRIPTION				
7" mill / 12" FDR / 7" PCC (28 ft width)				
DESIGN LIFE			TYPE	
35			PCC	
Year	#	Life	Description	Cost/Mile
0			OPTION #2 - Initial Const	$ 364,116
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	AO		Reseal Joints (15')	$ 57,111
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	AQ		Minor CPR (15')	$ 130,791
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (50,304)
			Total Present Worth	$ 447,600
			Eq. Annual Cost*	$19,339
			% of Low Cost	108%

OPTION #3				
DESCRIPTION				
4" mill / 6" WT (28 ft width)				
DESIGN LIFE			TYPE	
20			PCC	
Year	#	Life	Description	Cost/Mile
0			OPTION #3 - Initial Const	$ 295,396
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13	BB		1st CPR (20 yr design)	$ 93,497
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	BA		2nd CPR (20 yr design)	$ 233,228
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 489,022
			Eq. Annual Cost*	$21,128
			% of Low Cost	118%

OPTION #4				
DESCRIPTION				
5" mill / 5" overlay (28 ft width)				
DESIGN LIFE			TYPE	
15			BIT	
Year	#	Life	Description	Cost/Mile
0			OPTION #4 - Initial Const	$ 267,118
1				$ -
2				$ -
3	AA		Crack Treatment	$ 3,000
4				$ -
5				$ -
6				$ -
7	AB		Surface Treatment	$ 20,000
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15	BE		2" Mill & 3.5" Overlay	$ 171,147
16				$ -
17				$ -
18	AA		Crack Treatment	$ 3,000
19				$ -
20				$ -
21				$ -
22	AB		Surface Treatment	$ 20,000
23				$ -
24				$ -
25				$ -
26				$ -
27				$ -
28				$ -
29	BE		2" Mill & 3.5" Overlay	$ 171,147
30				$ -
31				$ -
32	AA		Crack Treatment	$ 3,000
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (92,156)
			Total Present Worth	$ 464,603
			Eq. Annual Cost*	$20,073
			% of Low Cost	112%

OPTION #5				
DESCRIPTION				
7" mill / 12" FDR / 1.5" add agg / 4.5" overlay				
DESIGN LIFE			TYPE	
20			BIT	
Year	#	Life	Description	Cost/Mile
0			OPTION #5 - Initial Const	$ 281,238
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8	BC		Light Crack Treatment	$ 1,500
9				$ -
10				$ -
11				$ -
12	AB		Surface Treatment	$ 20,000
13				$ -
14				$ -
15				$ -
16				$ -
17				$ -
18				$ -
19				$ -
20	BE		2" Mill & 3.5" Overlay	$ 171,147
21				$ -
22				$ -
23	AA		Crack Treatment	$ 3,000
24				$ -
25				$ -
26				$ -
27	AB		Surface Treatment	$ 20,000
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 413,754
			Eq. Annual Cost*	$17,876
			% of Low Cost	100%

* Equivalent Annual Cost is included for information only.

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

* Equivalent Annual Cost is included for information only.

Cost Analysis I-35 NB & SB From 1.13 Mi. N. Br#74804 to 0.65 Mi. S. T.H. 14 & From 0.4 Mi. N. Old T.H. 14 to CSAH 48

Givens:

Length =	32.33	miles		
Width of Road =	24	feet(Conc.)	24 feet(Bit.)	01/23/13-TRM
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.5	%		
Inflation Rate =	0	%		

***Note:** Aggregate and shoulder quantities were not included in each option.

MILL 2" & 3.5" min. Bituminous Overlay(15 years)

Item	Course	Unit	Price/Unit	Total Cost
2" MILL BITUMINOUS		SY	0.50	$227,603.20
PATCH		Ton	120.00	$155,184.00
TACK COAT		GAL	1.00	$91,041.28
3.5" SPWEB440E	Wear	TON	55.00	$4,950,938.61
		Total Cost:		**$5,424,767**
		Cost/Mile:		**$167,794**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$167,794	1.000	$167,794	$7,250
Rout & seal	2	$2,000	0.952	$1,904	$82
Mill & 3" Overlay	15	$147,440	0.690	$101,802	$4,398
Rout & seal	17	$2,000	0.657	$1,314	$57
Mill & 3" Overlay	29	$147,440	0.489	$72,048	$3,113
Rout & seal	31	$2,000	0.465	$930	$40
Remaining Life Value	35	($79,391)	0.421	-$33,453	-$1,445
		Total Present Worth:		**$312,339**	$13,495
		Equivalent Annual Cost:		**$13,495**	$13,495

9.5" Whitetopping-Doweled(15 years)

Item	Course	Unit	Price/Unit	Total Cost
6" MILL BITUMINOUS		SY	1.50	$682,809.60
Conc Std Width 9.5		SY	3.35	$1,524,941.44
Structural Concrete		CY	75.17	$9,030,094.60
Reinforcement Bars	Epoxy	lb	0.86	$172,939.64
Dowel Bars	Epoxy	each	8.19	$2,236,884.25
		Total Cost:		**$13,647,670**
		Cost/Mile:		**$422,136**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$422,136	1.000	$422,136	$18,239
Major CPR	20	$150,000	0.610	$91,541	$3,955
3" Overlay	30	$138,077	0.477	$65,827	$2,844
Rout & seal	32	$2,000	0.454	$908	$39
Remaining Life Value	35	($94,928)	0.421	-$40,000	-$1,728
		Total Present Worth:		**$540,412**	$23,349
		Equivalent Annual Cost:		**$23,349**	$23,349

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,whitetopping-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.

District	4
Performed By	SM
Analysis Period	35
Discount Rate	2.7

Project Number	7601-17
Date	5/9/2012
Funding Category	RS
Low Cost Option #	1
Chosen Option #	

OPTION #1					OPTION #2				
DESCRIPTION					DESCRIPTION				
Mill 1.5", Pave 3"(SPWEB340B)					6" Whitetopping				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			20	BIT				20	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0			Initial Cost	$ 104,404	0			Initial Cost	$ 269,370
1				$ -	1				$ -
2				$ -	2				$ -
3	AA	2	Crack Treatment	$ 2,000	3				$ -
4				$ -	4				$ -
5	AB	15	Surface Treatment	$ 20,000	5				$ -
6				$ -	6				$ -
7				$ -	7				$ -
8				$ -	8				$ -
9				$ -	9				$ -
10				$ -	10				$ -
11				$ -	11				$ -
12				$ -	12				$ -
13				$ -	13				$ -
14				$ -	14				$ -
15				$ -	15				$ -
16				$ -	16				$ -
17				$ -	17				$ -
18				$ -	18				$ -
19				$ -	19				$ -
20	AK	19	3" Mill & 3" Overlay	$ 110,000	20	BA	15	Major CPR and plane	$ 200,000
21				$ -	21				$ -
22				$ -	22				$ -
23	AA	2	Crack Treatment	$ 2,000	23				$ -
24				$ -	24				$ -
25	AB	14	Surface Treatment	$ 20,000	25				$ -
26				$ -	26				$ -
27				$ -	27				$ -
28				$ -	28				$ -
29				$ -	29				$ -
30				$ -	30				$ -
31				$ -	31				$ -
32				$ -	32				$ -
33				$ -	33				$ -
34				$ -	34				$ -
35			Remaining Service Life Value**	$ (24,000)	35			Remaining Service Life Value**	$ -
			Total Present Worth	$ 190,231				Total Present Worth	$ 386,757
			Eq. Annual Cost*	$8,470				Eq. Annual Cost*	$17,220
			% of Low Cost	100%				% of Low Cost	203%

* Equivalent Annual Cost is included for information only.

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

District	4
Performed By	SM
Analysis Period	35
Discount Rate	2.7

Project Number	7606-26
Date	6/5/2012
Funding Category	RS
Low Cost Option #	1
Chosen Option #	

OPTION #1					OPTION #2				
DESCRIPTION					DESCRIPTION				
Mill 3", Pave 3"(SPWEB340B)					6" Unbonded Concrete Overlay				
			DESIGN LIFE	TYPE				DESIGN LIFE	TYPE
			18	BIT				18	PCC
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0			Initial Cost	$ 110,388	0			Initial Cost	$ 386,197
1				$ -	1				$ -
2				$ -	2				$ -
3	AA	2	Crack Treatment	$ 2,000	3				$ -
4				$ -	4				$ -
5	AB	13	Surface Treatment	$ 20,000	5				$ -
6				$ -	6				$ -
7				$ -	7				$ -
8				$ -	8				$ -
9				$ -	9				$ -
10				$ -	10				$ -
11				$ -	11				$ -
12				$ -	12				$ -
13				$ -	13				$ -
14				$ -	14				$ -
15				$ -	15				$ -
16				$ -	16				$ -
17				$ -	17				$ -
18	AK	17	3" Mill & 3" Overlay	$ 110,388	18	BA	9	Major CPR and plane	$ 200,000
19				$ -	19				$ -
20				$ -	20				$ -
21	AA	2	Crack Treatment	$ 2,000	21				$ -
22				$ -	22				$ -
23	AB	12	Surface Treatment	$ 20,000	23				$ -
24				$ -	24				$ -
25				$ -	25				$ -
26				$ -	26				$ -
27				$ -	27	AZ	25	New Bituminous Structure	$ 345,300
28				$ -	28				$ -
29				$ -	29				$ -
30				$ -	30	AA	2	Crack Treatment	$ 2,000
31				$ -	31				$ -
32				$ -	32	AB	20	Surface Treatment	$ 20,000
33				$ -	33				$ -
34				$ -	34				$ -
35			Remaining Service Life Value**	$ -	35			Remaining Service Life Value**	$ (234,804)
			Total Present Worth	$ 210,057				Total Present Worth	$ 595,208
			Eq. Annual Cost*	$9,353				Eq. Annual Cost*	$26,501
			% of Low Cost	100%				% of Low Cost	283%

* Equivalent Annual Cost is included for information only.

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

District	3 - Baxter
Performed By	SZ
Analysis Period	35
Discount Rate	2.7

Project Number	7708-38
Date	6/27/2012
Funding Category	RS
Low Cost Option #	1
Chosen Option #	1

OPTION #1

DESCRIPTION	DESIGN LIFE	TYPE
1.5" Mill 3.0" OL, ML & Shldr	14 Years	BIT

Year	#	Life	Description	Cost/Mile
0	BD		1.5" ML Mill & Fill, 1.5" OL ML & S	$ 190,238
1				$ -
2				$ -
3				$ -
4	AA		Crack Treatment	$ 5,000
5				$ -
6				$ -
7				$ -
8				$ -
9	AB		Surface Treatment	$ 25,000
10				$ -
11				$ -
12				$ -
13				$ -
14	BC		3.0" Mill & Fill - ML Only	$ 143,405
15				$ -
16				$ -
17				$ -
18	AA		Crack Treatment	$ 5,000
19				$ -
20				$ -
21				$ -
22				$ -
23	AB		Surface Treatment	$ 25,000
24				$ -
25				$ -
26				$ -
27	BD		1.5" ML Mill & Fill, 1.5" OL ML & S	$ 190,238
28				$ -
29				$ -
30				$ -
31	AA		Crack Treatment	$ 5,000
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (63,413)
			Total Present Worth	$ 399,695
			Eq. Annual Cost*	$17,796
			% of Low Cost	100%

OPTION #2

DESCRIPTION	DESIGN LIFE	TYPE
6.0" Concrete Whitetopping	15 Years	PCC

Year	#	Life	Description	Cost/Mile
0	AX		6.0" Concrete Whitetopping	$ 342,252
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15	AR		Major CPR (6'X6')	$ 150,000
16				$ -
17				$ -
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25	BF		Rem and Rep Conc Surf	$ 478,943
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (159,648)
			Total Present Worth	$ 626,053
			Eq. Annual Cost*	$27,874
			% of Low Cost	157%

OPTION #3

DESCRIPTION	DESIGN LIFE	TYPE
3" Mill & 3" Overlay, ML & SHLD	14 Years	BIT

Year	#	Life	Description	Cost/Mile
0	BE		3" Mill & 3" Overlay, ML & SHLD	$ 251,293
1				$ -
2				$ -
3				$ -
4	AA		Crack Treatment	$ 5,000
5				$ -
6				$ -
7				$ -
8	AB		Surface Treatment	$ 25,000
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14	BC		3.0" Mill & Fill - ML Only	$ 143,405
15				$ -
16				$ -
17				$ -
18	AA		Crack Treatment	$ 5,000
19				$ -
20				$ -
21				$ -
22	AB		Surface Treatment	$ 25,000
23				$ -
24				$ -
25				$ -
26				$ -
27	BD		1.5" ML Mill & Fill, 1.5" OL ML & S	$ 190,238
28				$ -
29				$ -
30				$ -
31	AB		Surface Treatment	$ 25,000
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (63,412.67)
			Total Present Worth	$ 470,404
			Eq. Annual Cost*	$20,944
			% of Low Cost	118%

OPTION #4

DESCRIPTION	DESIGN LIFE	TYPE
4" Mill & Fill ML, 1.5" Mill & 3" Fill shld	15 Years	BIT

Year	#	Life	Description	Cost/Mile
0	BG		4" Mill & Fill ML, 1.5" Mill &3" Fill S	$ 296,701
1				$ -
2				$ -
3				$ -
4	AA		Crack Treatment	$ 5,000
5				$ -
6				$ -
7				$ -
8				$ -
9	AB		Surface Treatment	$ 25,000
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15	BC		3.0" Mill & Fill - ML Only	$ 143,405
16				$ -
17				$ -
18				$ -
19	AA		Crack Treatment	$ 5,000
20				$ -
21				$ -
22				$ -
23				$ -
24	AB		Surface Treatment	$ 25,000
25				$ -
26				$ -
27				$ -
28				$ -
29	BD		1.5" ML Mill & Fill, 1.5" OL ML & S	$ 190,238
30				$ -
31				$ -
32				$ -
33	AA		Crack Treatment	$ 5,000
34				$ -
35			Remaining Service Life Value**	$ (102,436)
			Total Present Worth	$ 482,844
			Eq. Annual Cost*	$21,498
			% of Low Cost	121%

* Equivalent Annual Cost is included for information only.

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

* Equivalent Annual Cost is included for informatio

District	7
Performed By	Kyle Vogt
Analysis Period	35
Discount Rate	2.2

Project Number	8307-09 (TH 30)
Date	12/9/2013
Funding Category	
Low Cost Option #	
Chosen Option #	

OPTION #1					OPTION #2					OPTION #3				
DESCRIPTION					DESCRIPTION					DESCRIPTION				
3.5" Mill & 3.5" Bituminous Overlay					12" Reclaimation & 4" Bituminous Overlay					3" Mill & 5" Whitetopping (No Dowels)				
DESIGN LIFE			TYPE		DESIGN LIFE			TYPE		DESIGN LIFE			TYPE	
15			Bit.		20			Bit.		20			Conc.	
Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile	Year	#	Life	Description	Cost/Mile
0		15	3.5" Mill & 3.5" Bit. Overlay	$ 310,956	0		20	12" Reclaim. & 4" Bit. Overlay	$ 387,117	0		20	3" Mill & 5" Whitetopping	$ 355,378
1				$ -	1				$ -	1				$ -
2				$ -	2				$ -	2				$ -
3	AA		Crack Treatment	$ 3,000	3				$ -	3				$ -
4				$ -	4				$ -	4				$ -
5				$ -	5				$ -	5				$ -
6				$ -	6				$ -	6				$ -
7	AB		Surface Treatment	$ 20,000	7				$ -	7				$ -
8				$ -	8	AA		Crack Treatment	$ 3,000	8				$ -
9				$ -	9				$ -	9				$ -
10				$ -	10				$ -	10				$ -
11				$ -	11				$ -	11				$ -
12				$ -	12	AB		Surface Treatment	$ 20,000	12				$ -
13				$ -	13				$ -	13	BB		13 yr. - Reseal Jts. & Part. Depth Rpr	$ 194,289
14				$ -	14				$ -	14				$ -
15	BN	14	2.5" Mill & 3.5" Bituminous Overla	$ 165,169	15				$ -	15				$ -
16				$ -	16				$ -	16				$ -
17				$ -	17				$ -	17				$ -
18	AA		Crack Treatment	$ 3,000	18				$ -	18				$ -
19				$ -	19				$ -	19				$ -
20				$ -	20	BP		2.5" Mill & 4" Bituminous Overlay	$ 187,830	20				$ -
21				$ -	21				$ -	21				$ -
22	AB		Surface Treatment	$ 20,000	22				$ -	22				$ -
23				$ -	23	AA		Crack Treatment	$ 3,000	23				$ -
24				$ -	24				$ -	24				$ -
25				$ -	25				$ -	25	BE		25 yr. - Major CPR (No Dowels)	$ 532,073
26				$ -	26				$ -	26				$ -
27				$ -	27	AB		Surface Treatment	$ 20,000	27				$ -
28				$ -	28				$ -	28				$ -
29	BN	13	2.5" Mill & 3.5" Bituminous Overla	$ 165,169	29				$ -	29				$ -
30				$ -	30				$ -	30				$ -
31				$ -	31				$ -	31				$ -
32	AA		Crack Treatment	$ 3,000	32				$ -	32				$ -
33				$ -	33				$ -	33				$ -
34				$ -	34				$ -	34				$ -
35			Remaining Service Life (7/13)	$ (88,937)	35			No Remaining Service Life	$ -	35			No Remaining Service Life	$ -
			Total Present Worth	$ 512,372				Total Present Worth	$ 539,521				Total Present Worth	$ 810,609
			Eq. Annual Cost*	$21,144				Eq. Annual Cost*	$22,265				Eq. Annual Cost*	$33,452
			% of Low Cost	100%				% of Low Cost	105%				% of Low Cost	158%

* Equivalent Annual Cost is included for information only.

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

District	4
Performed By	SJ
Analysis Period	35
Discount Rate	2.2

Project Number	8407-37
Date	11/8/2013
Funding Category	RS
Low Cost Option #	1
Chosen Option #	1

OPTION #1

DESCRIPTION	DESIGN LIFE	TYPE
Variable Depth Mill and Bituminous Overlay	17	BIT

Year	#	Life	Description	Cost/Mile
0			Initial Cost	$ 92,645
1				$ -
2	AA	2	Crack Treatment	$ 2,000
3				$ -
4	AB	13	Surface Treatment	$ 20,000
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	BA	16	2" Mill & 4" Overlay	$ 135,000
18				$ -
19	AA	2	Crack Treatment	$ 2,000
20				$ -
21	AB	12	Surface Treatment	$ 20,000
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27				$ -
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33	AK		3" Mill & 3" Overlay	$ 107,000
34				$ -
35			Remaining Service Life Value**	$ (93,000)
			Total Present Worth	$ 228,892
			Eq. Annual Cost*	$9,446
			% of Low Cost	100%

OPTION #2

DESCRIPTION	DESIGN LIFE	TYPE
6" Unbonded Concrete Overlay	17	PCC

Year	#	Life	Description	Cost/Mile
0			Initial Cost	$ 326,240
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	BD	9	Major CPR	$ 200,000
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26	BC	5	Minor CPR and Planing	$ 100,000
27				$ -
28				$ -
29				$ -
30				$ -
31	BE		Concrete Reconstruct	$ 387,000
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (343,000)
			Total Present Worth	$ 558,161
			Eq. Annual Cost*	$23,034
			% of Low Cost	244%

OPTION #3

DESCRIPTION	DESIGN LIFE	TYPE
Concrete Reconstruct	35	PCC

Year	#	Life	Description	Cost/Mile
0			Initial Cost	$ 387,644
1				$ -
2				$ -
3				$ -
4				$ -
5				$ -
6				$ -
7				$ -
8				$ -
9				$ -
10				$ -
11				$ -
12				$ -
13				$ -
14				$ -
15				$ -
16				$ -
17	BF	10	Joint Reseal and Minor CPR	$ 100,000
18				$ -
19				$ -
20				$ -
21				$ -
22				$ -
23				$ -
24				$ -
25				$ -
26				$ -
27	BG	13	Minor CPR & some full depth rep	$ 100,000
28				$ -
29				$ -
30				$ -
31				$ -
32				$ -
33				$ -
34				$ -
35			Remaining Service Life Value**	$ (38,000)
			Total Present Worth	$ 494,547
			Eq. Annual Cost*	$20,409
			% of Low Cost	216%

* Equivalent Annual Cost is included for information only.

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

Cost Analysis/ TH 43 From E. Jct. I-90 to T.H. 61

Givens:

Length =	7.679	miles		
Width of Road =	24	feet(Conc.)	24 feet(Bit.)	11/05/12-TRM
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.5	%		
Inflation Rate =	0	%		

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

Item	Course	Unit	Price/Unit	Total Cost
2" MILL BITUMINOUS		SY	0.80	$86,496.26
PATCH		Ton	100.00	$30,716.00
TACK COAT		GAL	$1.00	$21,624.06
3.5" SPWEB340B	Wear	TON	55.00	$1,175,943.63
		Total Cost:		**$1,314,780**
		Cost/Mile:		**$171,218**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$171,218	1.000	$171,218	$7,398
Rout & seal	2	$2,000	0.952	$1,904	$82
Chipseal	4	$20,000	0.906	$18,119	$783
Mill & 3" Overlay	17	$146,525	0.657	$96,296	$4,161
Rout & seal	19	$2,000	0.626	$1,251	$54
Chipseal	21	$20,000	0.595	$11,908	$514
Mill & 3" Overlay	33	$146,525	0.443	$64,867	$2,803
Remaining Life Value	35	($126,988)	0.421	-$53,509	-$2,312
	Total Present Worth:			**$312,052**	$13,482
	Equivalent Annual Cost:			**$13,482**	$13,482

5" Whitetopping(15 Year Fix)

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	1.25	$135,150.40
Conc Std Width 6		SY	5.00	$540,601.60
Structural Concrete		CY	68.50	$1,234,373.65
Reinforcement Bars	Epoxy	lb	0.80	$38,210.70
		Total Cost:		**$1,948,336**
		Cost/Mile:		**$253,723**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$253,723	1.000	$253,723	$10,962
Major CPR	15	$150,000	0.690	$103,570	$4,475
3.5" Bit. Overlay	25	$160,754	0.539	$86,709	$3,746
Rout & Seal	27	$2,000	0.513	$1,027	$44
Remaining Life Value	35	($66,198)	0.421	-$27,894	-$1,205
	Total Present Worth:			**$417,134**	$18,023
	Equivalent Annual Cost:			**$18,023**	$18,023

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, whitetopping-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.

Cost Analysis I-90 WB From 0.8 Mi. W. T.H. 76 to 0.69 Mi. W. CSAH 12

Givens:

Length =	8.439	miles		
Width of Road =	24	feet(Conc.)	24 feet(Bit.)	08/23/12-TRM
1" Bituminous =	113	lbs/SY		
Interest Rate =	2.5	%		
Inflation Rate =	0	%		

***Note:** Aggregate and shoulder quantities were not included in each option.

MILL & 3" min. Bituminous Overlay(15 years)

Item	Course	Unit	Price/Unit	Total Cost
1.5" MILL BITUMINOUS		SY	0.50	$59,410.56
PATCH		Ton	100.00	$33,756.00
TACK COAT		GAL	1.00	$23,764.22
3" SPWEB440E	Wear	TON	55.00	$1,107,709.89
		Total Cost:		**$1,224,641**
		Cost/Mile:		**$145,117**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$145,117	1.000	$145,117	$6,270
Rout & seal	2	$2,000	0.952	$1,904	$82
Mill & 3" Overlay	15	$147,440	0.690	$101,802	$4,398
Rout & seal	17	$2,000	0.657	$1,314	$57
Mill & 3" Overlay	29	$147,440	0.489	$72,048	$3,113
Rout & seal	31	$2,000	0.465	$930	$40
Remaining Life Value	35	($79,391)	0.421	-$33,453	-$1,445
		Total Present Worth:		**$289,663**	$12,515
		Equivalent Annual Cost:		**$12,515**	$12,515

8" Unbonded Concrete Overlay(30 years)

Item	Course	Unit	Price/Unit	Total Cost
2" MILL BITUMINOUS		SY	0.58	$68,916.25
PASSRC		Ton	44.57	$375,373.98
Conc Std Width 9		SY	3.35	$398,050.75
Structural Concrete		CY	75.17	$1,994,765.00
Reinforcement Bars	Epoxy	lb	0.86	$45,141.90
Dowel Bars	Epoxy	each	8.19	$583,886.98
		Total Cost:		**$3,466,135**
		Cost/Mile:		**$410,728**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$410,728	1.000	$410,728	$17,746
Minor CPR, plane	22	$150,000	0.581	$87,130	$3,764
Remaining Life Value	35	$0	0.421	$0	$0
		Total Present Worth:		**$497,858**	$21,510
		Equivalent Annual Cost:		**$21,510**	$21,510

6.5" Unbonded Concrete Overlay-Doweled(20 years)

Item	Course	Unit	Price/Unit	Total Cost
2" MILL BITUMINOUS		SY	0.58	$68,916.25
PASSRC		Ton	44.57	$375,373.98
Conc Std Width 6		SY	3.35	$398,050.75
Structural Concrete		CY	75.17	$1,607,721.05
Reinforcement Bars	Epoxy	lb	0.86	$45,141.90
Dowel Bars	Epoxy	each	8.19	$583,886.98
		Total Cost:		**$3,079,091**
		Cost/Mile:		**$364,864**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$364,864	1.000	$364,864	$15,764
Major CPR	20	$150,000	0.610	$91,541	$3,955
3" Overlay	30	$138,077	0.477	$65,827	$2,844
Rout & seal	32	$2,000	0.454	$908	$39
Remaining Life Value	35	($94,928)	0.421	-$40,000	-$1,728
		Total Present Worth:		**$483,140**	$20,874
		Equivalent Annual Cost:		**$20,874**	$20,874

3" MILL & 4.5" Bituminous Overlay(20 years)

Item	Course	Unit	Price/Unit	Total Cost
3" MILL BITUMINOUS		SY	1.20	$142,585.34
PATCH		Ton	100.00	$33,756.00
TACK COAT		GAL	1.00	$35,646.34
4.5" SPWEB440E	Wear	TON	55.00	$1,661,564.84
		Total Cost:		**$1,873,553**
		Cost/Mile:		**$222,011**

Strategy	Year	Cost/Mile	P/F	Present Worth	Annual Cost
Initial Cost	0	$222,011	1.000	$222,011	$9,592
Rout & seal	2	$2,000	0.952	$1,904	$82
Mill & 3" Overlay	20	$147,440	0.610	$89,978	$3,888
Rout & seal	22	$2,000	0.581	$1,162	$50
Remaining Life Value	35	($31,040)	0.421	-$13,079	-$565
		Total Present Worth:		**$301,976**	$13,047
		Equivalent Annual Cost:		**$13,047**	$13,047

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,thick overlay-20 years , thick unbonded-30 years,thin 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.