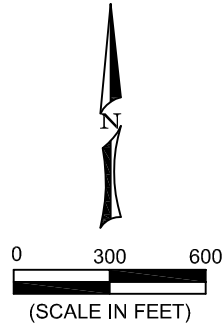
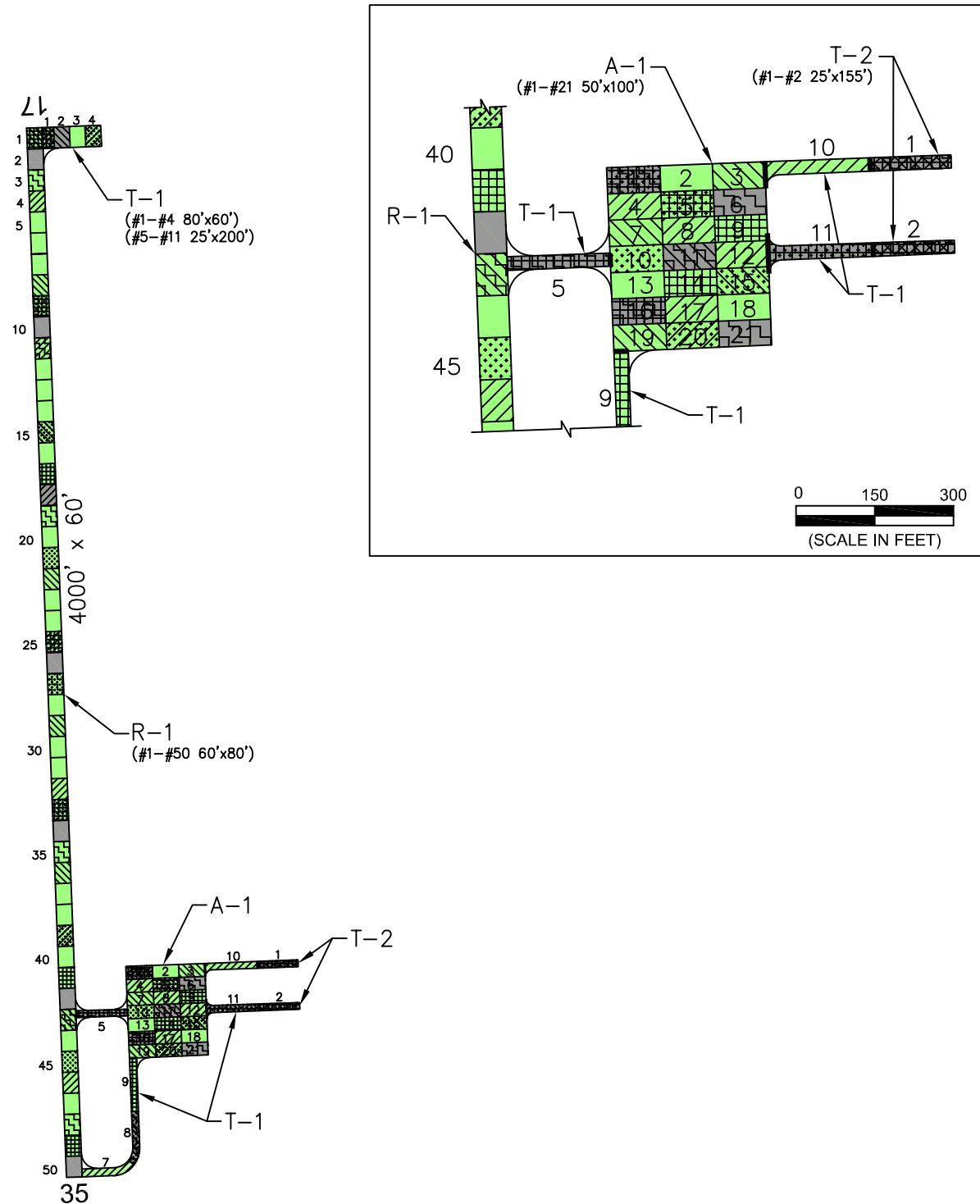


# TOWNSEND



## PAVEMENT STRENGTH SURVEY/PAVEMENT CONDITION SURVEY

PAVE. IDENT.	SOIL CLASS	SUB GRADE CLASS	SUBBASE COURSE	BASE COURSE	SURFACE COURSE	OVERLAY	PAVEMENT STRENGTH			REMARKS
							MAX. GROSS LOAD (LBS)			
							SINGLE	DUAL	DUAL TAN.	
<b>RUNWAYS</b>										
R-1			10" P-152	4" P-208	3" P-401	2"P-401,P-609	12,500			1,2,3,4,5,6
<b>TAXIWAYS</b>										
T-1			10" P-152	4" P-208	3" P-401	2"P-401,P-609	12,500			1,2,3,4,5,6
T-2			P-152	12" P-208	4" P-401		12,500			3,4,5,6
<b>APRONS</b>										
A-1			10" P-152	4" P-208	3" P-401	2"P-401,P-609	12,500			1,2,3,4,5,6

**REMARKS:**

- AIP-003-1992, NEW CONSTRUCTION; 0.25" P-609 COMPLETED IN SEPTEMBER 1993.
- NON-AIP, 1996, CRACK SEAL, FOG SEAL, AND REMARK ALL PAVEMENTS.
- AIP-004-2002, CRACK SEAL AND OVERLAY RUNWAY (R-1), TAXIWAYS (T-1), AND APRON (A-1); CONSTRUCT HANGAR ACCESS TAXIWAY EXTENSIONS (T-2).
- AIP-007-2007, CRACK SEAL, FOG SEAL, AND REMARK ALL PAVEMENTS.
- AIP-010-2012, CRACK SEAL, FOG SEAL, AND REMARK ALL PAVEMENTS.
- AIP-011-2017, CRACK SEAL, SURFACE SEAL AND REMARK ALL PAVEMENTS.

**LEGEND**

- 2006 SURVEY AREA
- 2009 SURVEY AREA
- 2012 SURVEY AREA
- 2015 SURVEY AREA
- 2018 SURVEY AREA
- MAINTAIN: PCI > 60
- TRANSITION: PCI 45 TO 60
- RECONSTRUCT: PCI < 45

DATE OF PAVEMENT STRENGTH SURVEY:	
EVALUATED BY:	
DATE OF MOST RECENT PAVEMENT CONDITION SURVEY:	OCT. 16, 2018
EVALUATED BY:	N. SCHROHT
LOCATION:	TOWNSEND MONTANA

**MONTANA AVIATION SYSTEM PLAN  
2018 UPDATE - PAVEMENT CONDITION INDEXES**

**TOWNSEND AIRPORT  
(8U8)**

Date: Prepared For: Prepared By:

DECEMBER 2018



TOWNSEND



**A-1, Overview**



**A-1, Bleeding**



**R-1, Overview**



**R-11, Crack with Depression**



**T-1, Overview**



**T-1, Block Crack**



**T-2, Overview**



**T-2, Patch**

# TOWNSEND AIRPORT

Branch: 55A      **APRON**

**A-1**

**Length:** 350 LF      **Width:** 300 LF      **Area:** 105,000 SF      **Last Const:** 2002      **Family:** ACAM  
**From:** ENTIRE APRON      **To:**      **Surface:** AAC

**Inspections**

**Samples Surveyed:** 5      **Total Samples:** 21      **Last Inspection Date:** 10/16/2018      **PCI:** 66

**Sample # 1**      **Area:** 5,000 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	575 LF
BLEEDING	NA	2 SF
WEATHERING	L	5000 SF
DEPRESSION	L	5 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	48 LF

**Sample # 6**      **Area:** 5,000 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	650 LF
RAVELING	L	1900 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	7 LF
WEATHERING	L	5000 SF

**Sample # 11**      **Area:** 5,000 SF

Distress Description	Severity	Quantity
WEATHERING	L	5000 SF
LONGITUDINAL/TRANSVERSE CRACKING	L	360 LF
DEPRESSION	L	17 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	64 LF

**Sample # 16**      **Area:** 5,000 SF

Distress Description	Severity	Quantity
WEATHERING	L	5000 SF
RAVELING	L	64 SF
LONGITUDINAL/TRANSVERSE CRACKING	L	311 LF
LONGITUDINAL/TRANSVERSE CRACKING	M	40 LF

**Sample # 21**      **Area:** 5,000 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	M	11 LF
WEATHERING	L	5000 SF
LONGITUDINAL/TRANSVERSE CRACKING	L	431 LF

**Extrapolated Distress Quantities\***

Distress Description	Severity	Quantity	Density	Deduct
BLEEDING	N/A	8 SF	0.01%	0.00
DEPRESSION	LOW	92 SF	0.09%	0.30
LONGITUDINAL/TRANSVERSE CRACKING	LOW	9,773 LF	9.31%	22.31
LONGITUDINAL/TRANSVERSE CRACKING	MEDIUM	714 LF	0.68%	9.49
RAVELING	LOW	8,249 SF	7.86%	8.68
WEATHERING	LOW	105,000 SF	100.00%	5.96

\* Multiple deduct values are scaled down from their algebraic sum to keep the model consistent with experimental data.

**Percent of Deduct Values Based on Distress Mechanism**

0.0 % Load      99.0 % Climate/Durability      1.0 % Other

# TOWNSEND AIRPORT

Branch: 55R RUNWAY

**R-1**

**Length:** 4,000 LF

**Width:** 60 LF

**Area:** 240,000 SF

**Last Const:** 2002

**Family:** ACRML

**From:** 0+00 R/W 16-34

**To:** 40+00 R/W 16/34

**Surface:** AAC

**Inspections**

**Samples Surveyed:** 7      **Total Samples:** 50      **Last Inspection Date:** 10/16/2018      **PCI:** 70

**Sample # 3**      **Area:** 4,800 SF

Distress Description	Severity	Quantity
WEATHERING	L	4800 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	29 LF
LONGITUDINAL/TRANSVERSE CRACKING	L	340 LF

**Sample # 11**      **Area:** 4,800 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	M	21 LF
WEATHERING	L	4800 SF
LONGITUDINAL/TRANSVERSE CRACKING	L	408 LF

**Sample # 19**      **Area:** 4,800 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	394 LF
LONGITUDINAL/TRANSVERSE CRACKING	M	27 LF
WEATHERING	L	4800 SF

**Sample # 27**      **Area:** 4,800 SF

Distress Description	Severity	Quantity
WEATHERING	L	4800 SF
LONGITUDINAL/TRANSVERSE CRACKING	L	318 LF
LONGITUDINAL/TRANSVERSE CRACKING	M	47 LF

**Sample # 43**      **Area:** 4,800 SF

Distress Description	Severity	Quantity
WEATHERING	L	4800 SF
LONGITUDINAL/TRANSVERSE CRACKING	L	498 LF
LONGITUDINAL/TRANSVERSE CRACKING	M	12 LF

**Sample # 48**      **Area:** 4,800 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	M	12 LF
LONGITUDINAL/TRANSVERSE CRACKING	L	264 LF
WEATHERING	L	4800 SF

**Extrapolated Distress Quantities\***

Distress Description	Severity	Quantity	Density	Deduct
DEPRESSION	MEDIUM	36 SF	0.01%	5.20
LONGITUDINAL/TRANSVERSE CRACKING	LOW	17,743 LF	7.39%	19.33
LONGITUDINAL/TRANSVERSE CRACKING	MEDIUM	1,586 LF	0.66%	9.37
WEATHERING	LOW	240,000 SF	100.00%	5.96

\* Multiple deduct values are scaled down from their algebraic sum to keep the model consistent with experimental data.

**Percent of Deduct Values Based on Distress Mechanism**

0.0 % Load      87.0 % Climate/Durability      13.0 % Other

# TOWNSEND AIRPORT

Branch: 55T TAXIWAY

**T-1**

**Length:** 1,324 LF      **Width:** 26 LF      **Area:** 34,700 SF      **Last Const:** 2002      **Family:** ACRML  
**From:** APRON TO R/W 16-34      **To:** AND R/W TURNAROUNDS      **Surface:** AAC

**Inspections**

**Samples Surveyed:** 4      **Total Samples:** 11      **Last Inspection Date:** 10/16/2018      **PCI:** **69**

**Sample # 3**      **Area:** 4,800 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	M	23 LF
LONGITUDINAL/TRANSVERSE CRACKING	L	390 LF
LONGITUDINAL/TRANSVERSE CRACKING	L	400 LF
WEATHERING	L	4800 SF

**Sample # 5**      **Area:** 5,000 SF

Distress Description	Severity	Quantity
WEATHERING	L	5000 SF
DEPRESSION	L	3 SF
LONGITUDINAL/TRANSVERSE CRACKING	L	300 LF
LONGITUDINAL/TRANSVERSE CRACKING	M	46 LF

**Sample # 8**      **Area:** 5,000 SF

Distress Description	Severity	Quantity
PATCHING	L	51 SF
LONGITUDINAL/TRANSVERSE CRACKING	L	477 LF
WEATHERING	L	5000 SF

**Sample # 10**      **Area:** 5,000 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	M	32 LF
LONGITUDINAL/TRANSVERSE CRACKING	L	215 LF
LONGITUDINAL/TRANSVERSE CRACKING	L	200 LF
WEATHERING	L	500 SF

**Extrapolated Distress Quantities\***

Distress Description	Severity	Quantity	Density	Deduct
DEPRESSION	LOW	5 SF	0.02%	0.30
LONGITUDINAL/TRANSVERSE CRACKING	LOW	3,474 LF	10.01%	23.29
LONGITUDINAL/TRANSVERSE CRACKING	MEDIUM	177 LF	0.51%	8.37
PATCHING	LOW	89 SF	0.26%	2.07
WEATHERING	LOW	26,814 SF	77.27%	5.66

\* Multiple deduct values are scaled down from their algebraic sum to keep the model consistent with experimental data.

**Percent of Deduct Values Based on Distress Mechanism**

0.0 % Load      99.0 % Climate/Durability      1.0 % Other

# TOWNSEND AIRPORT

Branch: 55T TAXIWAY

**T-2**

**Length:** 310 LF      **Width:** 25 LF      **Area:** 7,750 SF      **Last Const:** 2002      **Family:** ACRML  
**From:** T-1      **To:** HANGARS      **Surface:** AC

**Inspections**

**Samples Surveyed:** 2      **Total Samples:** 2      **Last Inspection Date:** 10/16/2018      **PCI:** **62**

**Sample # 1**      **Area:** 3,875 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	152 LF
ALLIGATOR	H	22 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	22 LF
RUTTING	M	22 SF
WEATHERING	L	3875 SF
PATCHING	L	44 SF

**Sample # 2**      **Area:** 3,875 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	221 LF
WEATHERING	L	3875 SF

**Extrapolated Distress Quantities\***

Distress Description	Severity	Quantity	Density	Deduct
ALLIGATOR	HIGH	22 SF	0.28%	25.15
LONGITUDINAL/TRANSVERSE CRACKING	LOW	373 LF	4.81%	14.36
LONGITUDINAL/TRANSVERSE CRACKING	MEDIUM	22 LF	0.28%	6.29
PATCHING	LOW	44 SF	0.57%	2.61
RUTTING	MEDIUM	22 SF	0.28%	17.17

\* Multiple deduct values are scaled down from their algebraic sum to keep the model consistent with experimental data.

**Percent of Deduct Values Based on Distress Mechanism**

59.0 % Load      41.0 % Climate/Durability      0.0 % Other

**TOWNSEND AIRPORT (55)**

FIFTEEN YEAR PROJECTIONS							ESTIMATED AVERAGE ANNUAL COST:		\$75,554	
Plan Year: 2019							Estimated Cost:	\$154,560	PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After		
A-1	Preventive + Global MR	\$7,608	\$35,700	\$0	\$0	\$43,307	66	72		
R-1	Preventive + Global MR	\$12,515	\$81,599	\$0	\$0	\$94,114	70	75		
T-1	Preventive + Global MR	\$1,986	\$11,798	\$0	\$0	\$13,784	69	74		
T-2	Preventive + Global MR	\$719	\$2,635	\$0	\$0	\$3,354	61	69		
Plan Year: 2020							Estimated Cost:	\$16,003	PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After		
A-1	Preventive	\$5,329	\$0	\$0	\$0	\$5,329	70	70		
R-1	Preventive	\$8,756	\$0	\$0	\$0	\$8,756	73	73		
T-1	Preventive	\$1,388	\$0	\$0	\$0	\$1,388	73	73		
T-2	Preventive	\$530	\$0	\$0	\$0	\$530	66	67		
Plan Year: 2021							Estimated Cost:	\$19,044	PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After		
A-1	Preventive	\$6,357	\$0	\$0	\$0	\$6,357	68	68		
R-1	Preventive	\$10,435	\$0	\$0	\$0	\$10,435	72	72		
T-1	Preventive	\$1,638	\$0	\$0	\$0	\$1,638	71	71		
T-2	Preventive	\$614	\$0	\$0	\$0	\$614	64	64		
Plan Year: 2022							Estimated Cost:	\$22,140	PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After		
A-1	Preventive	\$7,387	\$0	\$0	\$0	\$7,387	66	66		
R-1	Preventive	\$12,132	\$0	\$0	\$0	\$12,132	70	70		
T-1	Preventive	\$1,924	\$0	\$0	\$0	\$1,924	69	69		
T-2	Preventive	\$698	\$0	\$0	\$0	\$698	62	62		
Plan Year: 2023							Estimated Cost:	\$48,332	PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After		
A-1	Preventive	\$8,415	\$0	\$0	\$0	\$8,415	64	64		
R-1	Preventive	\$14,232	\$0	\$0	\$0	\$14,232	68	68		
T-2	Major Below Critical	\$0	\$0	\$23,448	\$0	\$23,448	60	100		
T-1	Preventive	\$2,237	\$0	\$0	\$0	\$2,237	67	67		
Plan Year: 2024							Estimated Cost:	\$157,412	PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After		
A-1	Preventive + Global MR	\$9,446	\$35,700	\$0	\$0	\$45,145	62	68		
R-1	Preventive + Global MR	\$16,321	\$81,599	\$0	\$0	\$97,921	66	72		
T-1	Preventive + Global MR	\$2,549	\$11,798	\$0	\$0	\$14,347	65	71		
T-2	None	\$0	\$0	\$0	\$0	\$0	97	97		
Plan Year: 2025							Estimated Cost:	\$20,845	PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After		
A-1	Preventive	\$7,172	\$0	\$0	\$0	\$7,172	66	66		
R-1	Preventive	\$11,808	\$0	\$0	\$0	\$11,808	70	70		
T-1	Preventive	\$1,865	\$0	\$0	\$0	\$1,865	69	69		
T-2	None	\$0	\$0	\$0	\$0	\$0	94	94		
Plan Year: 2026							Estimated Cost:	\$24,227	PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After		
A-1	Preventive	\$8,201	\$0	\$0	\$0	\$8,201	64	65		
R-1	Preventive	\$13,848	\$0	\$0	\$0	\$13,848	68	69		
T-1	Preventive	\$2,177	\$0	\$0	\$0	\$2,177	67	68		
T-2	None	\$0	\$0	\$0	\$0	\$0	91	91		
Plan Year: 2027							Estimated Cost:	\$27,671	PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After		
A-1	Preventive	\$9,230	\$0	\$0	\$0	\$9,230	62	63		
R-1	Preventive	\$15,938	\$0	\$0	\$0	\$15,938	67	67		
T-1	Preventive	\$2,488	\$0	\$0	\$0	\$2,488	66	66		
T-2	Preventive	\$15	\$0	\$0	\$0	\$15	88	88		
Plan Year: 2028							Estimated Cost:	\$31,132	PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After		
A-1	Preventive	\$10,259	\$0	\$0	\$0	\$10,259	60	61		
R-1	Preventive	\$18,036	\$0	\$0	\$0	\$18,036	65	65		
T-1	Preventive	\$2,800	\$0	\$0	\$0	\$2,800	64	64		
T-2	Preventive	\$37	\$0	\$0	\$0	\$37	85	85		



**TOWNSEND AIRPORT (55)**

**FIFTEEN YEAR PROJECTIONS** **ESTIMATED AVERAGE ANNUAL COST: \$75,554**

Plan Year: 2029 Estimated Cost: \$455,316 PCI

Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After
A-1	Major Below Critical	\$0	\$0	\$338,625	\$0	\$338,625	59	100
R-1	Preventive + Global MR	\$20,123	\$81,599	\$0	\$0	\$101,722	63	69
T-2	Preventive	\$58	\$0	\$0	\$0	\$58	82	83
T-1	Preventive + Global MR	\$3,113	\$11,798	\$0	\$0	\$14,911	62	68

Plan Year: 2030 Estimated Cost: \$18,082 PCI

Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After
A-1	None	\$0	\$0	\$0	\$0	\$0	97	97
R-1	Preventive	\$15,565	\$0	\$0	\$0	\$15,565	67	67
T-1	Preventive	\$2,429	\$0	\$0	\$0	\$2,429	66	66
T-2	Preventive	\$87	\$0	\$0	\$0	\$87	80	80

Plan Year: 2031 Estimated Cost: \$20,565 PCI

Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After
A-1	None	\$0	\$0	\$0	\$0	\$0	94	94
R-1	Preventive	\$17,652	\$0	\$0	\$0	\$17,652	65	65
T-1	Preventive	\$2,740	\$0	\$0	\$0	\$2,740	64	64
T-2	Preventive	\$173	\$0	\$0	\$0	\$173	77	77

Plan Year: 2032 Estimated Cost: \$23,061 PCI

Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After
A-1	None	\$0	\$0	\$0	\$0	\$0	91	91
R-1	Preventive	\$19,750	\$0	\$0	\$0	\$19,750	64	64
T-1	Preventive	\$3,052	\$0	\$0	\$0	\$3,052	62	63
T-2	Preventive	\$259	\$0	\$0	\$0	\$259	74	74

Plan Year: 2033 Estimated Cost: \$42,423 PCI

Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	Before	After
A-1	Preventive	\$210	\$0	\$0	\$0	\$210	88	88
R-1	Preventive	\$21,842	\$0	\$0	\$0	\$21,842	62	62
T-1	Preventive	\$3,364	\$0	\$0	\$0	\$3,364	61	61
T-2	Preventive + Global MR	\$345	\$16,662	\$0	\$0	\$17,007	71	87