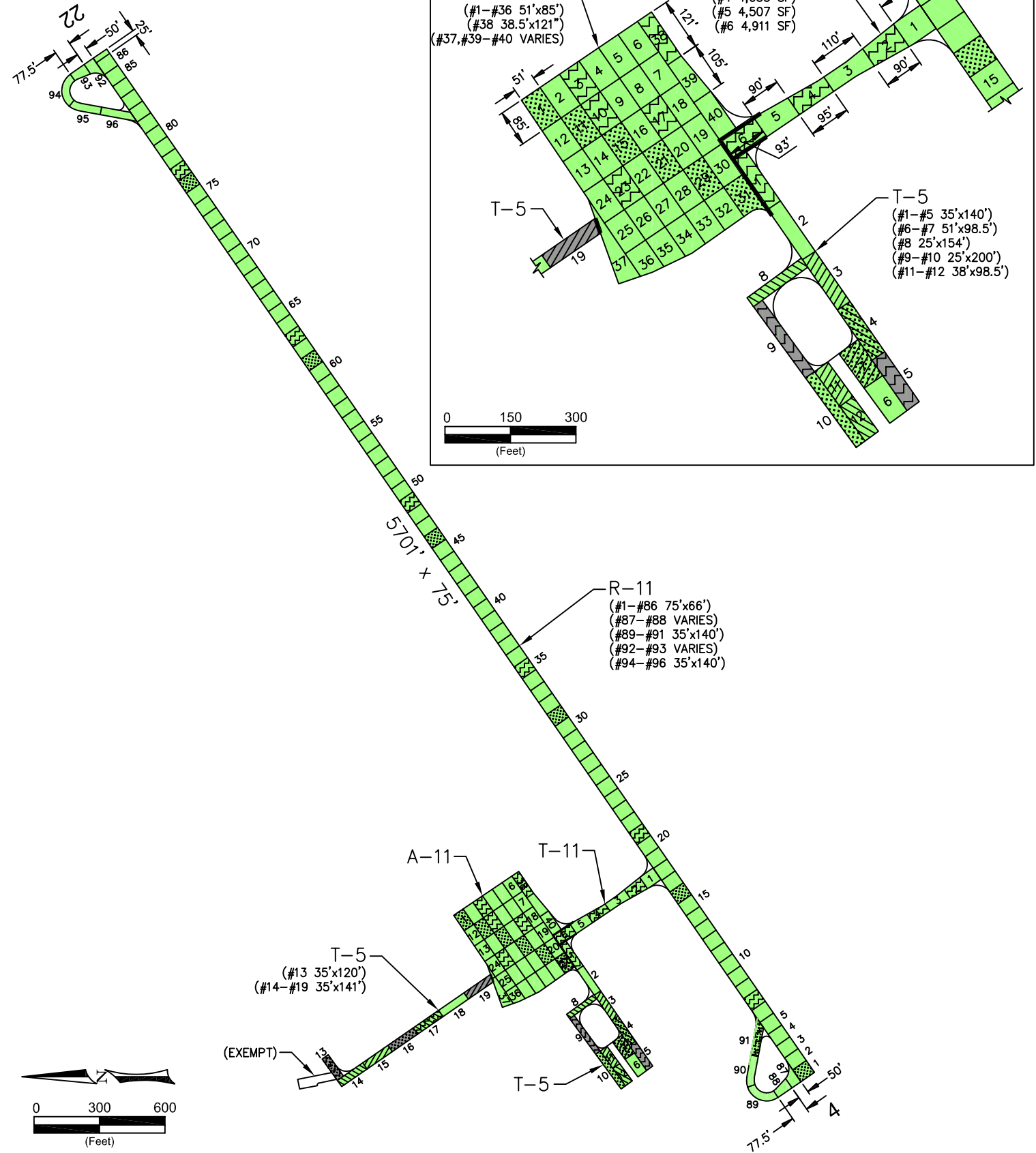
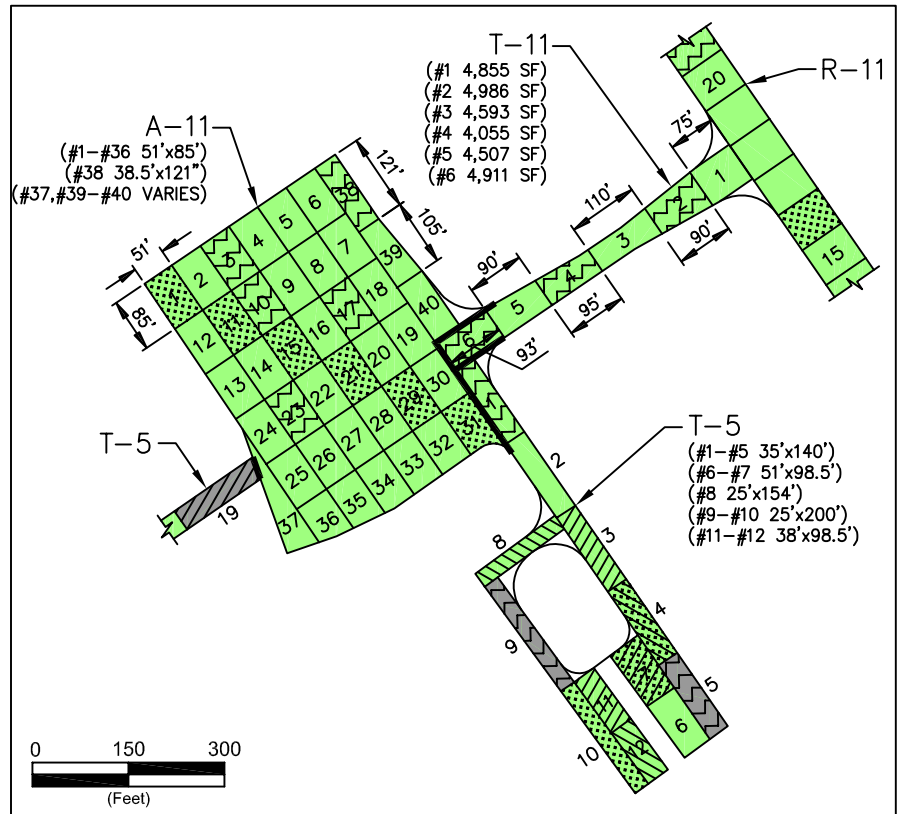


# LIVINGSTON





## 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-11		CBR=18.6		6" P-209	4" P-401		75,000	99,999		2,3
<b>TAXIWAYS</b>										
T-5		CBR=18.6	8" P-154	6" P-209	3" P-401	P-609	30,000	30,000		1,2,3
T-11		CBR=18.6		6" P-209	4" P-401		75,000	99,999		2,3
<b>APRONS</b>										
A-11		CBR=18.6		6" P-209	4" P-401		75,000	99,999		2,3

**REMARKS:**  
 ADAP-01, 1972, EXTEND RUNWAY AND CONSTRUCT RUNWAY 22 TURNAROUND.  
 AIP-001-1983, CHIP SEAL ALL PAVEMENTS (P-602).  
 AIP-002-1993, 1" OVERLAY, APRON EXPANSION, AND CONSTRUCT RUNWAY 22 TURNAROUND EXTENSION.  
 AIP-003-2002, CRACK SEAL, FOG SEAL, AND REMARK ALL PAVEMENTS.

- AIP-004-2005, CONSTRUCT TAXIWAYS (T-5). SELECT ON-SITE BORROW WAS USED TO REPLACE UNSUITABLE SUBGRADE, TYPICALLY RANGING FROM 0" TO 6" (SPOT LOCATIONS WERE AS DEEP AS 4 FT.).
- AIP-006/007-2011, RECONSTRUCT RUNWAY (R-11), CONNECTING TAXIWAY (T-11), AND APRON (A-11); CONSTRUCT RUNWAY TURNAROUNDS AND APRON EXPANSION; FOG SEAL TAXIWAYS (T-5). [NEW PAVEMENTS NOT INSPECTED IN 2012.]
- AIP-009-2016, CRACK SEAL, SURFACE SEAL AND REMARK ALL PAVEMENTS.

<b>LEGEND</b> ■ 2006 SURVEY AREA (N/A) ▨ 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:		<b>MONTANA AVIATION SYSTEM PLAN</b> <b>2018 UPDATE - PAVEMENT CONDITION INDEXES</b> <b>MISSION FIELD (LVM)</b> Date: _____ Prepared For: _____ Prepared By: _____ DECEMBER 2018  
	EVALUATED BY:		
	DATE OF MOST RECENT PAVEMENT CONDITION SURVEY:	SEPT. 7, 2018	
	EVALUATED BY:	N. SCHROHT	
LOCATION:	LIVINGSTON MONTANA		



**A-11, Overview**



**A-11, Cracking**



**R-11, Overview**



**R-11, Patch-Core**



**T-5, Overview**



**T-5, Slip Crack**



**T-11, Overview**



**T-11, Patch-Core**



# LIVINGSTON AIRPORT

Branch: 24A      **APRON**

**A-11**

**Length:** 510 LF      **Width:** 360 LF      **Area:** 183,600 SF      **Last Const:** 2011      **Family:** ACAH  
**From:** T-11      **To:** T-5      **Surface:** AC

**Inspections**

**Samples Surveyed:** 6      **Total Samples:** 40      **Last Inspection Date:** 9/7/2018      **PCI:** 87

**Sample # 3**      **Area:** 4,335 SF

Distress Description	Severity	Quantity
WEATHERING	L	4335 SF

**Sample # 10**      **Area:** 4,335 SF

Distress Description	Severity	Quantity
RAVELING	L	78 SF
WEATHERING	L	4335 SF
PATCHING	L	12.37 SF

**Sample # 17**      **Area:** 4,335 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	44 LF
PATCHING	L	0.2 SF
WEATHERING	L	4335 SF

**Sample # 23**      **Area:** 4,335 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	20 LF
PATCHING	L	1.77 SF

**Sample # 31**      **Area:** 4,335 SF

Distress Description	Severity	Quantity
RAVELING	L	240 SF
RAVELING	H	25 SF
WEATHERING	L	4335 SF
LONGITUDINAL/TRANSVERSE CRACKING	L	60 LF

**Sample # 38**      **Area:** 4,658 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	28 LF
RAVELING	H	3 SF
WEATHERING	L	4658 SF

**Extrapolated Distress Quantities\***

Distress Description	Severity	Quantity	Density	Deduct
LONGITUDINAL/TRANSVERSE CRACKING	LOW	1,060 LF	0.58%	4.19
PATCHING	LOW	100 SF	0.05%	2.00
RAVELING	HIGH	195 SF	0.11%	6.30
RAVELING	LOW	2,217 SF	1.21%	2.93
WEATHERING	LOW	153,376 SF	83.54%	5.77

\* 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      100.0 % Climate/Durability      0.0 % Other

**LIVINGSTON AIRPORT**

Branch: 24R RUNWAY

**R-11**

Length: 5,701 LF  
From: 0+00

Width: 75 LF

Area: 427,575 SF  
To: 57+01

Last Const: 2011

Family: ACAH  
Surface: AC

**Inspections**

Samples Surveyed: 7      Total Samples: 96      Last Inspection Date: 9/7/2018      **PCI: 86**

<b>Sample # 7</b>	<b>Distress Description</b> WEATHERING LONGITUDINAL/TRANSVERSE CRACKING	<b>Severity</b> L L	<b>Quantity</b> 4875 SF 63 LF	<b>Area:</b> 4,875 SF
<b>Sample # 21</b>	<b>Distress Description</b> LONGITUDINAL/TRANSVERSE CRACKING WEATHERING	<b>Severity</b> L L	<b>Quantity</b> 106 LF 4875 SF	<b>Area:</b> 4,875 SF
<b>Sample # 35</b>	<b>Distress Description</b> WEATHERING PATCHING LONGITUDINAL/TRANSVERSE CRACKING	<b>Severity</b> L L L	<b>Quantity</b> 4875 SF 0.2 SF 118 LF	<b>Area:</b> 4,875 SF
<b>Sample # 49</b>	<b>Distress Description</b> LONGITUDINAL/TRANSVERSE CRACKING WEATHERING	<b>Severity</b> L L	<b>Quantity</b> 120 LF 4875 SF	<b>Area:</b> 4,875 SF
<b>Sample # 63</b>	<b>Distress Description</b> WEATHERING LONGITUDINAL/TRANSVERSE CRACKING	<b>Severity</b> L L	<b>Quantity</b> 4875 SF 152 LF	<b>Area:</b> 4,875 SF
<b>Sample # 77</b>	<b>Distress Description</b> LONGITUDINAL/TRANSVERSE CRACKING WEATHERING	<b>Severity</b> L L	<b>Quantity</b> 90 LF 4875 SF	<b>Area:</b> 4,875 SF
<b>Sample # 91</b>	<b>Distress Description</b> WEATHERING RAVELING LONGITUDINAL/TRANSVERSE CRACKING PATCHING	<b>Severity</b> L H L L	<b>Quantity</b> 4900 SF 1 SF 38 LF 0.09 SF	<b>Area:</b> 4,900 SF

**Extrapolated Distress Quantities\***

Distress Description	Severity	Quantity	Density	Deduct
LONGITUDINAL/TRANSVERSE CRACKING	LOW	8,602 LF	2.01%	7.44
PATCHING	LOW	4 SF	0.00%	2.00
RAVELING	HIGH	13 SF	0.00%	6.00
WEATHERING	LOW	427,575 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      100.0 % Climate/Durability      0.0 % Other

# LIVINGSTON AIRPORT

Branch: 24T TAXIWAY

**T-5**

Length: 2,565 LF      Width: 35 LF      Area: 89,775 SF      Last Const: 2005      Family: ACRH  
 From: T-1 / A-1      To: HANGARS      Surface: AC

**Inspections**

**Samples Surveyed:** 5      **Total Samples:** 19      **Last Inspection Date:** 9/7/2018      **PCI:** 68

Sample #	Distress Description	Severity	Quantity	Area:
1	BLEEDING	NA	8 SF	4,900 SF
	LONGITUDINAL/TRANSVERSE CRACKING	L	178 LF	
	PATCHING	L	0.09 SF	
5	RAVELING	H	25 SF	4,900 SF
	LONGITUDINAL/TRANSVERSE CRACKING	L	27 LF	
9	PATCHING	L	0.4 SF	5,000 SF
	LONGITUDINAL/TRANSVERSE CRACKING	L	47 LF	
	RAVELING	H	2 SF	
	SLIPPAGE	NA	720 SF	
13	BLEEDING	NA	1 SF	4,200 SF
	LONGITUDINAL/TRANSVERSE CRACKING	L	45 LF	
	RAVELING	H	243 SF	
17	LONGITUDINAL/TRANSVERSE CRACKING	L	184 LF	4,935 SF

**Extrapolated Distress Quantities\***

Distress Description	Severity	Quantity	Density	Deduct
BLEEDING	N/A	34 SF	0.04%	0.00
LONGITUDINAL/TRANSVERSE CRACKING	LOW	1,804 LF	2.01%	7.44
PATCHING	LOW	2 SF	0.00%	2.00
RAVELING	HIGH	1,013 SF	1.13%	18.32
SLIPPAGE	N/A	2,701 SF	3.01%	26.57

\* 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      51.0 % Climate/Durability      49.0 % Other

# LIVINGSTON AIRPORT

Branch: 24T TAXIWAY

**T-11**

**Length:** 463 LF      **Width:** 35 LF      **Area:** 16,205 SF      **Last Const:** 2011      **Family:** ACRH  
**From:** RUNWAY      **To:** APRON      **Surface:** AC

**Inspections**

**Samples Surveyed:** 3      **Total Samples:** 6      **Last Inspection Date:** 9/7/2018      **PCI:** 93

<b>Sample #</b> 2	<b>Distress Description</b> WEATHERING	<b>Severity</b> L	<b>Quantity</b> 4986 SF	<b>Area:</b> 4,986 SF
<b>Sample #</b> 4	<b>Distress Description</b> WEATHERING PATCHING	<b>Severity</b> L L	<b>Quantity</b> 4107 SF 0.2 SF	<b>Area:</b> 4,107 SF
<b>Sample #</b> 6	<b>Distress Description</b> WEATHERING LONGITUDINAL/TRANSVERSE CRACKING	<b>Severity</b> L L	<b>Quantity</b> 491 SF 69 LF	<b>Area:</b> 4,911 SF

**Extrapolated Distress Quantities\***

Distress Description	Severity	Quantity	Density	Deduct
LONGITUDINAL/TRANSVERSE CRACKING	LOW	80 LF	0.49%	4.05
PATCHING	LOW	0 SF	0.00%	2.00
WEATHERING	LOW	11,090 SF	68.44%	5.45

\* 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      100.0 % Climate/Durability      0.0 % Other

**LIVINGSTON AIRPORT (24)**

**FIFTEEN YEAR PROJECTIONS** **ESTIMATED AVERAGE ANNUAL COST: \$78,741**

Plan Year: 2019 Estimated Cost: \$252,253 PCI

Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI	
							Before	After
T-11	Global MR	\$0	\$5,510	\$0	\$0	\$5,510	93	96
A-11	Preventive + Global MR	\$665	\$62,423	\$0	\$0	\$63,089	86	92
R-11	Preventive + Global MR	\$1,998	\$145,374	\$0	\$0	\$147,372	85	91
T-5	Preventive + Global MR	\$5,759	\$30,523	\$0	\$0	\$36,282	67	75

Plan Year: 2020 Estimated Cost: \$3,927 PCI

Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI	
							Before	After
R-11	Preventive	\$246	\$0	\$0	\$0	\$246	89	90
T-5	Preventive	\$3,681	\$0	\$0	\$0	\$3,681	72	72
A-11	None	\$0	\$0	\$0	\$0	\$0	90	90
T-11	None	\$0	\$0	\$0	\$0	\$0	95	95

Plan Year: 2021 Estimated Cost: \$5,845 PCI

Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI	
							Before	After
A-11	Preventive	\$307	\$0	\$0	\$0	\$307	88	88
R-11	Preventive	\$1,045	\$0	\$0	\$0	\$1,045	88	88
T-5	Preventive	\$4,493	\$0	\$0	\$0	\$4,493	70	70
T-11	None	\$0	\$0	\$0	\$0	\$0	94	94

Plan Year: 2022 Estimated Cost: \$7,973 PCI

Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI	
							Before	After
A-11	Preventive	\$626	\$0	\$0	\$0	\$626	87	87
R-11	Preventive	\$1,839	\$0	\$0	\$0	\$1,839	86	86
T-5	Preventive	\$5,508	\$0	\$0	\$0	\$5,508	68	68
T-11	None	\$0	\$0	\$0	\$0	\$0	93	93

Plan Year: 2023 Estimated Cost: \$10,105 PCI

Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI	
							Before	After
A-11	Preventive	\$945	\$0	\$0	\$0	\$945	85	85
R-11	Preventive	\$2,642	\$0	\$0	\$0	\$2,642	84	84
T-5	Preventive	\$6,518	\$0	\$0	\$0	\$6,518	65	66
T-11	None	\$0	\$0	\$0	\$0	\$0	92	92

Plan Year: 2024 Estimated Cost: \$256,062 PCI

Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI	
							Before	After
T-11	Global MR	\$0	\$5,510	\$0	\$0	\$5,510	91	94
A-11	Preventive + Global MR	\$1,264	\$62,423	\$0	\$0	\$63,687	83	89
R-11	Preventive + Global MR	\$3,440	\$145,374	\$0	\$0	\$148,814	82	88
T-5	Preventive + Global MR	\$7,527	\$30,523	\$0	\$0	\$38,050	63	71

Plan Year: 2025 Estimated Cost: \$7,522 PCI

Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI	
							Before	After
A-11	Preventive	\$570	\$0	\$0	\$0	\$570	87	87
R-11	Preventive	\$1,692	\$0	\$0	\$0	\$1,692	86	86
T-5	Preventive	\$5,260	\$0	\$0	\$0	\$5,260	68	68
T-11	None	\$0	\$0	\$0	\$0	\$0	93	93

Plan Year: 2026 Estimated Cost: \$9,650 PCI

Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI	
							Before	After
A-11	Preventive	\$889	\$0	\$0	\$0	\$889	85	85
R-11	Preventive	\$2,491	\$0	\$0	\$0	\$2,491	84	84
T-5	Preventive	\$6,271	\$0	\$0	\$0	\$6,271	66	66
T-11	None	\$0	\$0	\$0	\$0	\$0	92	92

Plan Year: 2027 Estimated Cost: \$11,775 PCI

Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI	
							Before	After
A-11	Preventive	\$1,206	\$0	\$0	\$0	\$1,206	83	84
R-11	Preventive	\$3,289	\$0	\$0	\$0	\$3,289	82	82
T-5	Preventive	\$7,280	\$0	\$0	\$0	\$7,280	64	64
T-11	None	\$0	\$0	\$0	\$0	\$0	91	91

Plan Year: 2028 Estimated Cost: \$13,910 PCI

Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	PCI	
							Before	After
A-11	Preventive	\$1,525	\$0	\$0	\$0	\$1,525	82	82
R-11	Preventive	\$4,084	\$0	\$0	\$0	\$4,084	80	81
T-11	Preventive	\$6	\$0	\$0	\$0	\$6	90	90
T-5	Preventive	\$8,295	\$0	\$0	\$0	\$8,295	62	62



**LIVINGSTON AIRPORT (24)**

**FIFTEEN YEAR PROJECTIONS ESTIMATED AVERAGE ANNUAL COST: \$78,741**

Plan Year: 2029						Estimated Cost:	\$501,236	PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total		Before	After
T-5	Major Below Critical	\$0	\$0	\$279,290	\$0	\$279,290		59	100
A-11	Preventive + Global MR	\$1,880	\$62,423	\$0	\$0	\$64,303		80	86
R-11	Preventive + Global MR	\$6,737	\$145,374	\$0	\$0	\$152,111		79	85
T-11	Preventive + Global MR	\$22	\$5,510	\$0	\$0	\$5,531		89	92

Plan Year: 2030						Estimated Cost:	\$4,282	PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total		Before	After
A-11	Preventive	\$1,148	\$0	\$0	\$0	\$1,148		84	84
R-11	Preventive	\$3,134	\$0	\$0	\$0	\$3,134		83	83
T-11	None	\$0	\$0	\$0	\$0	\$0		91	91
T-5	None	\$0	\$0	\$0	\$0	\$0		97	97

Plan Year: 2031						Estimated Cost:	\$5,404	PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total		Before	After
A-11	Preventive	\$1,467	\$0	\$0	\$0	\$1,467		82	82
R-11	Preventive	\$3,933	\$0	\$0	\$0	\$3,933		81	81
T-11	Preventive	\$5	\$0	\$0	\$0	\$5		90	90
T-5	None	\$0	\$0	\$0	\$0	\$0		94	94

Plan Year: 2032						Estimated Cost:	\$7,912	PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total		Before	After
A-11	Preventive	\$1,786	\$0	\$0	\$0	\$1,786		80	80
R-11	Preventive	\$6,105	\$0	\$0	\$0	\$6,105		79	79
T-11	Preventive	\$21	\$0	\$0	\$0	\$21		89	89
T-5	None	\$0	\$0	\$0	\$0	\$0		91	91

Plan Year: 2033						Estimated Cost:	\$12,434	PCI	
Section	Maintenance	Local	Global	Major<Crit	Major>Crit	Total		Before	After
A-11	Preventive	\$2,915	\$0	\$0	\$0	\$2,915		79	79
R-11	Preventive	\$9,303	\$0	\$0	\$0	\$9,303		77	77
T-11	Preventive	\$36	\$0	\$0	\$0	\$36		88	88
T-5	Preventive	\$179	\$0	\$0	\$0	\$179		88	88