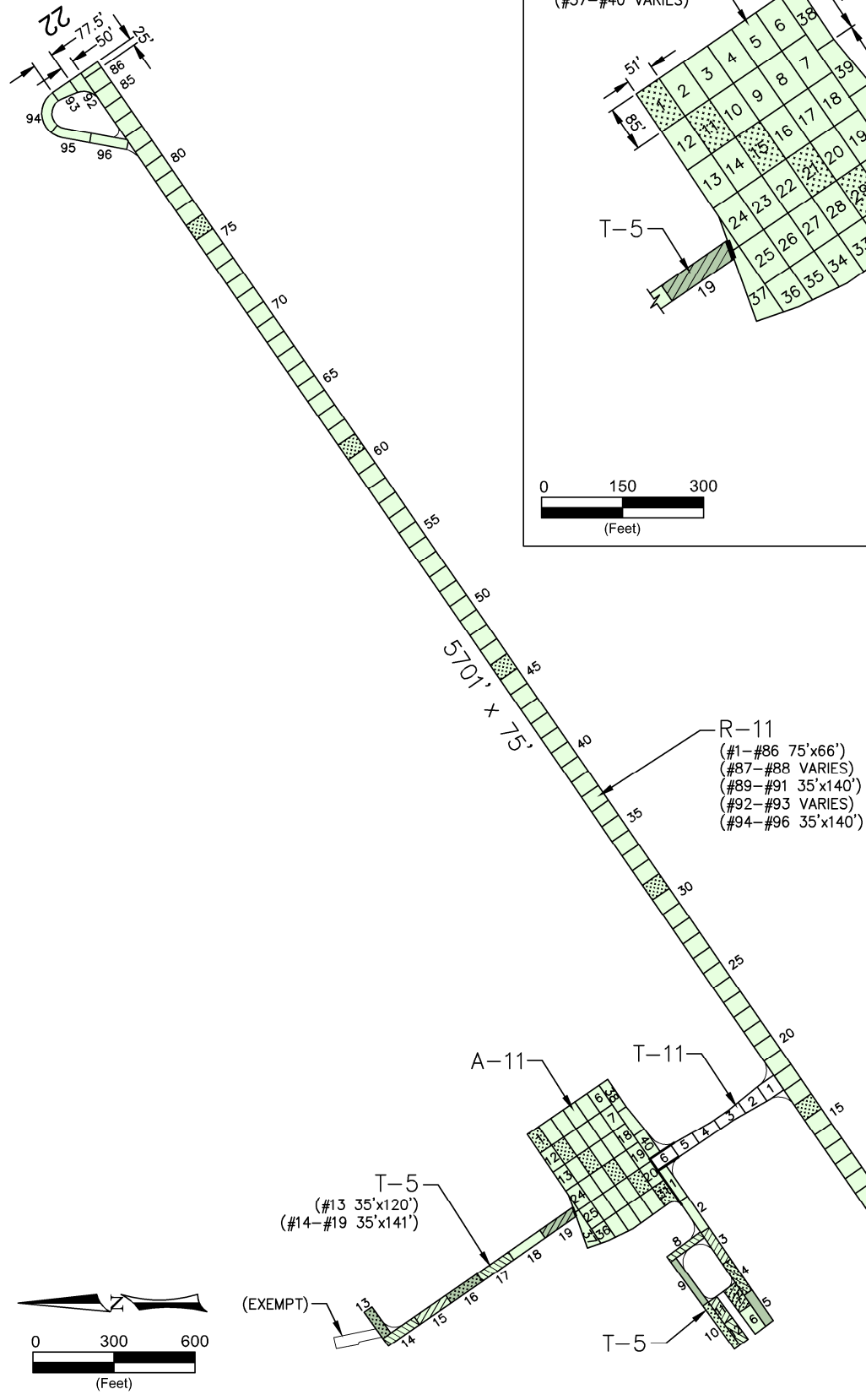
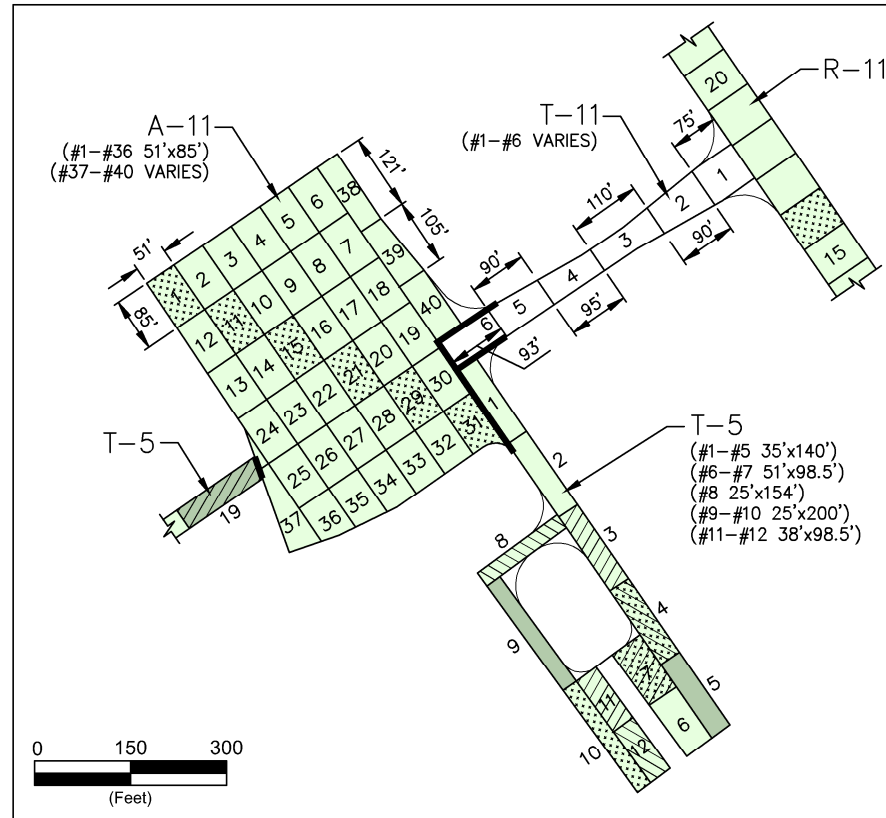


LIVINGSTON



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.	
RUNWAYS										
R-11		CBR=18.6		6" P-209	4" P-401		75,000	99,999		2
TAXIWAYS										
T-5		CBR=18.6	8" P-154	6" P-209	3" P-401	P-609	30,000	30,000		1,2
T-11		CBR=18.6		6" P-209	4" P-401		75,000	99,999		2
APRONS										
A-11		CBR=18.6		6" P-209	4" P-401		75,000	99,999		2

REMARKS:

- ADAP-01, 1972, EXTEND RUNWAY AND CONSTRUCT RUNWAY 22 TURNAROUND.
 AIP-01, 1983, CHIP SEAL ALL PAVEMENTS (P-602).
 AIP-02, 1993, 1" OVERLAY, APRON EXPANSION, AND CONSTRUCT RUNWAY 22 TURNAROUND EXTENSION.
 AIP-03, 2002, CRACK SEAL, FOG SEAL, AND REMARK ALL PAVEMENTS.
 1. 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.).
 2. 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.]

LEGEND

- 2003 SURVEY AREA (N/A)
- 2006 SURVEY AREA
- 2009 SURVEY AREA
- 2012 SURVEY AREA
- 2015 SURVEY AREA
- MAINTAIN: PCI > 60
- TRANSITION: PCI 45 TO 60
- RECONSTRUCT: PCI < 45

DATE OF PAVEMENT STRENGTH SURVEY:	DEC. 1992
EVALUATED BY:	G. GATES
DATE OF MOST RECENT PAVEMENT CONDITION SURVEY:	SEPT. 11, 2015
EVALUATED BY:	S. MARKWARDT
LOCATION:	LIVINGSTON MONTANA

**MONTANA AVIATION SYSTEM PLAN
2015 UPDATE - PAVEMENT CONDITION INDEXES**

**MISSION FIELD
(LVM)**

Date: DECEMBER 2015
 Prepared For: MONTANA DEPARTMENT OF TRANSPORTATION
 Prepared By: RPA Robert Peccia & Associates, Inc.

LIVINGSTON AIRPORT

9/11/2015



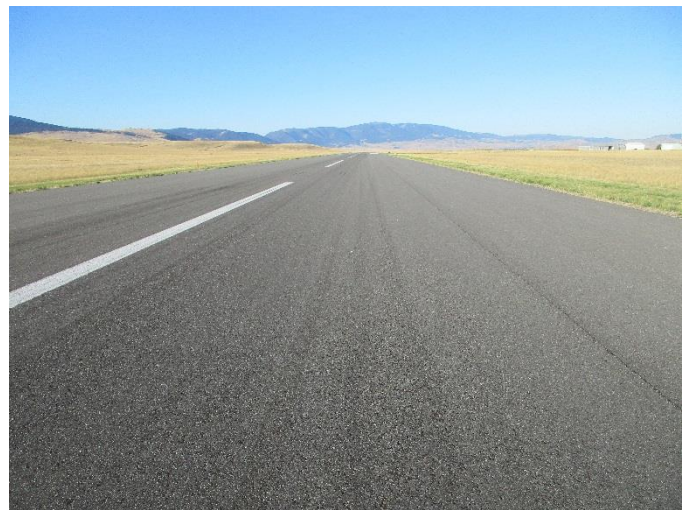
A-11, Overview



A-11, Surface detail with gouging



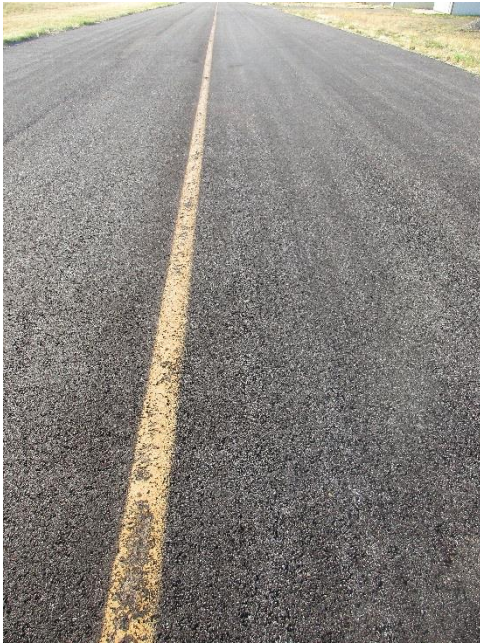
R-11, Surface detail



R-11, Overview

LIVINGSTON AIRPORT

9/11/2015



T-5, Overview



T-5, Surface detail with roller checking

LIVINGSTON AIRPORT

Branch: 24A

APRON

A-11

Length: 510 LF **Width:** 360 LF **Area:** 183,600 SF **Last Const. :** 2011 **Family:** ACAH15
From: T-11 **To:** T-5 **Surface:** AC

Inspections

Samples Surveyed: 6 **Total Samples:** 40 **Last Inspection Date (RPA)** 9/11/2015 **PCI:** **83**

Sample # 1 **Area:** 4335 SF

Distress Description	Severity	Quantity
WEATHERING	L	129 SF
RAVELING	L	86 SF
RAVELING	H	3 SF

Sample # 11 **Area:** 4335 SF

Distress Description	Severity	Quantity
WEATHERING	L	129 SF
RAVELING	L	86 SF
PATCHING	L	19 SF
DEPRESSION	H	6 SF
RAVELING	H	1 SF

Sample # 15 **Area:** 4335 SF

Distress Description	Severity	Quantity
WEATHERING	L	129 SF
RAVELING	L	86 SF
RAVELING	H	1 SF
PATCHING	L	1 SF

Sample # 21 **Area:** 4335 SF

Distress Description	Severity	Quantity
WEATHERING	L	129 SF
LONGITUDINAL/TRANSVERSE CRACKING	L	38 LF
RAVELING	L	86 SF
PATCHING	L	9 SF
DEPRESSION	L	3 SF

Sample # 29 **Area:** 4335 SF

Distress Description	Severity	Quantity
LONGITUDINAL/TRANSVERSE CRACKING	L	90 LF
WEATHERING	L	129 SF
RAVELING	L	86 SF
OIL SPILLAGE	N	1 SF

Sample # 31 **Area:** 4335 SF

Distress Description	Severity	Quantity
WEATHERING	L	129 SF
LONGITUDINAL/TRANSVERSE CRACKING	L	34 LF
RAVELING	L	86 SF
OIL SPILLAGE	N	34 SF
RAVELING	H	23 SF
DEPRESSION	L	3 SF

Extrapolated Distress Quantities*

Distress Description	Severity	Quantity	Density	Deduct
DEPRESSION	H	42 SF	0.02 %	12.00
RAVELING	H	198 SF	0.11 %	6.36
LONGITUDINAL/TRANSVERSE CRACKING	L	1144 LF	0.62 %	4.26
RAVELING	L	3642 SF	1.98 %	3.97
OIL SPILLAGE	N	247 SF	0.13 %	2.09
PATCHING	L	205 SF	0.11 %	2.00
WEATHERING	L	5464 SF	2.98 %	0.82
DEPRESSION	L	42 SF	0.02 %	0.30

* 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 55.0 % Climate/Durability 45.0 % Other

LIVINGSTON AIRPORT

Branch: 24R

RUNWAY

R-11

Length: 5,701 LF **Width:** 75 LF **Area:** 427,575 SF **Last Const. :** 2011 **Family:** ACRH15
From: STA 0+00 **To:** STA 57+01 **Surface:** AC

Inspections

Samples Surveyed: 7 **Total Samples:** 96 **Last Inspection Date (RPA)** 9/11/2015 **PCI:** 82

Sample # 1	<table border="0"> <tr> <th style="text-align: left;">Distress Description</th> <th style="text-align: left;">Severity</th> <th style="text-align: left;">Quantity</th> </tr> <tr> <td>LONGITUDINAL/TRANSVERSE CRACKING</td> <td>L</td> <td>203 LF</td> </tr> <tr> <td>WEATHERING</td> <td>L</td> <td>488 SF</td> </tr> <tr> <td>RAVELING</td> <td>L</td> <td>98 SF</td> </tr> <tr> <td>WEATHERING</td> <td>M</td> <td>20 SF</td> </tr> <tr> <td>RAVELING</td> <td>M</td> <td>5 SF</td> </tr> </table>	Distress Description	Severity	Quantity	LONGITUDINAL/TRANSVERSE CRACKING	L	203 LF	WEATHERING	L	488 SF	RAVELING	L	98 SF	WEATHERING	M	20 SF	RAVELING	M	5 SF	Area: 4875 SF			
Distress Description	Severity	Quantity																					
LONGITUDINAL/TRANSVERSE CRACKING	L	203 LF																					
WEATHERING	L	488 SF																					
RAVELING	L	98 SF																					
WEATHERING	M	20 SF																					
RAVELING	M	5 SF																					
Sample # 16	<table border="0"> <tr> <th style="text-align: left;">Distress Description</th> <th style="text-align: left;">Severity</th> <th style="text-align: left;">Quantity</th> </tr> <tr> <td>WEATHERING</td> <td>L</td> <td>488 SF</td> </tr> <tr> <td>LONGITUDINAL/TRANSVERSE CRACKING</td> <td>L</td> <td>119 LF</td> </tr> <tr> <td>RAVELING</td> <td>L</td> <td>98 SF</td> </tr> <tr> <td>PATCHING</td> <td>L</td> <td>1 SF</td> </tr> </table>	Distress Description	Severity	Quantity	WEATHERING	L	488 SF	LONGITUDINAL/TRANSVERSE CRACKING	L	119 LF	RAVELING	L	98 SF	PATCHING	L	1 SF	Area: 4875 SF						
Distress Description	Severity	Quantity																					
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Distress Description	Severity	Quantity																					
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RAVELING	M	24 SF																					
PATCHING	L	1 SF																					
Sample # 46	<table border="0"> <tr> <th style="text-align: left;">Distress Description</th> <th style="text-align: left;">Severity</th> <th style="text-align: left;">Quantity</th> </tr> <tr> <td>WEATHERING</td> <td>L</td> <td>488 SF</td> </tr> <tr> <td>LONGITUDINAL/TRANSVERSE CRACKING</td> <td>L</td> <td>119 LF</td> </tr> <tr> <td>RAVELING</td> <td>L</td> <td>98 SF</td> </tr> <tr> <td>WEATHERING</td> <td>M</td> <td>28 SF</td> </tr> </table>	Distress Description	Severity	Quantity	WEATHERING	L	488 SF	LONGITUDINAL/TRANSVERSE CRACKING	L	119 LF	RAVELING	L	98 SF	WEATHERING	M	28 SF	Area: 4875 SF						
Distress Description	Severity	Quantity																					
WEATHERING	L	488 SF																					
LONGITUDINAL/TRANSVERSE CRACKING	L	119 LF																					
RAVELING	L	98 SF																					
WEATHERING	M	28 SF																					
Sample # 61	<table border="0"> <tr> <th style="text-align: left;">Distress Description</th> <th style="text-align: left;">Severity</th> <th style="text-align: left;">Quantity</th> </tr> <tr> <td>WEATHERING</td> <td>L</td> <td>487 SF</td> </tr> <tr> <td>LONGITUDINAL/TRANSVERSE CRACKING</td> <td>L</td> <td>125 LF</td> </tr> <tr> <td>RAVELING</td> <td>L</td> <td>98 SF</td> </tr> </table>	Distress Description	Severity	Quantity	WEATHERING	L	487 SF	LONGITUDINAL/TRANSVERSE CRACKING	L	125 LF	RAVELING	L	98 SF	Area: 4875 SF									
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LONGITUDINAL/TRANSVERSE CRACKING	L	125 LF																					
RAVELING	L	98 SF																					
Sample # 76	<table border="0"> <tr> <th style="text-align: left;">Distress Description</th> <th style="text-align: left;">Severity</th> <th style="text-align: left;">Quantity</th> </tr> <tr> <td>WEATHERING</td> <td>L</td> <td>487 SF</td> </tr> <tr> <td>LONGITUDINAL/TRANSVERSE CRACKING</td> <td>L</td> <td>96 LF</td> </tr> <tr> <td>RAVELING</td> <td>L</td> <td>98 SF</td> </tr> <tr> <td>WEATHERING</td> <td>M</td> <td>10 SF</td> </tr> </table>	Distress Description	Severity	Quantity	WEATHERING	L	487 SF	LONGITUDINAL/TRANSVERSE CRACKING	L	96 LF	RAVELING	L	98 SF	WEATHERING	M	10 SF	Area: 4875 SF						
Distress Description	Severity	Quantity																					
WEATHERING	L	487 SF																					
LONGITUDINAL/TRANSVERSE CRACKING	L	96 LF																					
RAVELING	L	98 SF																					
WEATHERING	M	10 SF																					
Sample # 91	<table border="0"> <tr> <th style="text-align: left;">Distress Description</th> <th style="text-align: left;">Severity</th> <th style="text-align: left;">Quantity</th> </tr> <tr> <td>WEATHERING</td> <td>M</td> <td>488 SF</td> </tr> <tr> <td>LONGITUDINAL/TRANSVERSE CRACKING</td> <td>L</td> <td>64 LF</td> </tr> <tr> <td>RAVELING</td> <td>L</td> <td>98 SF</td> </tr> <tr> <td>RAVELING</td> <td>M</td> <td>2 SF</td> </tr> <tr> <td>PATCHING</td> <td>L</td> <td>1 SF</td> </tr> <tr> <td>DEPRESSION</td> <td>L</td> <td>1 SF</td> </tr> </table>	Distress Description	Severity	Quantity	WEATHERING	M	488 SF	LONGITUDINAL/TRANSVERSE CRACKING	L	64 LF	RAVELING	L	98 SF	RAVELING	M	2 SF	PATCHING	L	1 SF	DEPRESSION	L	1 SF	Area: 4875 SF
Distress Description	Severity	Quantity																					
WEATHERING	M	488 SF																					
LONGITUDINAL/TRANSVERSE CRACKING	L	64 LF																					
RAVELING	L	98 SF																					
RAVELING	M	2 SF																					
PATCHING	L	1 SF																					
DEPRESSION	L	1 SF																					

Extrapolated Distress Quantities*

Distress Description	Severity	Quantity	Density	Deduct
LONGITUDINAL/TRANSVERSE CRACKING	L	10625 LF	2.48 %	8.70
RAVELING	M	388 SF	0.09 %	4.00
RAVELING	L	8595 SF	2.01 %	4.00
WEATHERING	M	6841 SF	1.60 %	2.08
PATCHING	L	38 SF	0.01 %	2.00
WEATHERING	L	36662 SF	8.57 %	1.54
DEPRESSION	L	13 SF	0.00 %	0.30

* 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

LIVINGSTON AIRPORT

Branch: 24T

TAXIWAY

T-5

Length: 2,565 LF **Width:** 35 LF **Area:** 89,775 SF **Last Const. :** 2005 **Family:** ACRH15
From: T-1 / A-1 **To:** HANGARS **Surface:** AC

Inspections

Samples Surveyed: 5 **Total Samples:** 19 **Last Inspection Date (RPA)** 9/11/2015 **PCI:** **74**

Sample # 4 **Distress Description** **Severity** **Quantity** **Area:** 4900 SF

LONGITUDINAL/TRANSVERSE CRACKING	L	57 LF
WEATHERING	L	150 SF
RAVELING	L	100 SF

Sample # 7 **Distress Description** **Severity** **Quantity** **Area:** 5024 SF

LONGITUDINAL/TRANSVERSE CRACKING	L	109 LF
WEATHERING	L	150 SF
RAVELING	L	100 SF
PATCHING	L	73 SF
LONGITUDINAL/TRANSVERSE CRACKING	M	19 LF

Sample # 10 **Distress Description** **Severity** **Quantity** **Area:** 5000 SF

LONGITUDINAL/TRANSVERSE CRACKING	L	2228 LF
WEATHERING	L	500 SF
RAVELING	L	100 SF
OIL SPILLAGE	N	6 SF
PATCHING	L	3 SF
RAVELING	M	3 SF

Sample # 13 **Distress Description** **Severity** **Quantity** **Area:** 4200 SF

WEATHERING	L	126 SF
LONGITUDINAL/TRANSVERSE CRACKING	L	31 LF
RAVELING	L	84 SF
RAVELING	M	7 SF
PATCHING	L	1 SF

Sample # 16 **Distress Description** **Severity** **Quantity** **Area:** 4905 SF

LONGITUDINAL/TRANSVERSE CRACKING	L	110 LF
WEATHERING	L	126 SF
RAVELING	L	84 SF
RAVELING	H	2 SF
PATCHING	L	1 SF
RAVELING	M	1 SF
BLEEDING	N	1 SF

Extrapolated Distress Quantities*

Distress Description	Severity	Quantity	Density	Deduct
LONGITUDINAL/TRANSVERSE CRACKING	L	9471 LF	10.55 %	24.00
RAVELING	H	7 SF	0.01 %	6.00
RAVELING	M	41 SF	0.05 %	4.00
LONGITUDINAL/TRANSVERSE CRACKING	M	71 LF	0.08 %	4.00
RAVELING	L	1748 SF	1.95 %	3.92
PATCHING	L	291 SF	0.32 %	2.15
OIL SPILLAGE	N	22 SF	0.02 %	2.00
WEATHERING	L	3930 SF	4.38 %	1.01
BLEEDING	N	4 SF	0.00 %	0.00

* 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 96.0 % Climate/Durability 4.0 % Other

LIVINGSTON AIRPORT

FIFTEEN YEAR PROJECTIONS: ESTIMATED AVERAGE ANNUAL COST: \$191,828

PLAN YEAR: 2016			ESTIMATED COST:			\$356,540	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
T-5	Prev. & Thin AC	\$2,977	\$175,061			\$178,038	74	89
R-11	Prev. & Seal Coat	\$4,993	\$119,721			\$124,714	80	86
A-11	Prev. & Seal Coat	\$2,379	\$51,408			\$53,788	79	89
PLAN YEAR: 2017			ESTIMATED COST:			\$4,664	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
T-5	Basic Prev.	\$415				\$415	86	86
R-11	Basic Prev.	\$3,191				\$3,191	83	83
A-11	Basic Prev.	\$1,058				\$1,058	84	85
PLAN YEAR: 2018			ESTIMATED COST:			\$7,484	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
R-11	Basic Prev.	\$4,842				\$4,842	80	80
T-5	Basic Prev.	\$737				\$737	82	82
A-11	Basic Prev.	\$1,905				\$1,905	80	81
PLAN YEAR: 2019			ESTIMATED COST:			\$16,043	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
T-5	Basic Prev.	\$1,220				\$1,220	79	80
R-11	Basic Prev.	\$9,792				\$9,792	77	77
A-11	Basic Prev.	\$5,031				\$5,031	76	77
PLAN YEAR: 2020			ESTIMATED COST:			\$25,018	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
T-5	Basic Prev.	\$2,275				\$2,275	77	77
A-11	Basic Prev.	\$8,307				\$8,307	72	73
R-11	Basic Prev.	\$14,436				\$14,436	75	75
PLAN YEAR: 2021			ESTIMATED COST:			\$233,466	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
T-5	Basic Prev.	\$3,259				\$3,259	75	75
A-11	Prev. & Seal Coat	\$13,047	\$59,596			\$72,643	69	78
R-11	Prev. & Seal Coat	\$18,775	\$138,790			\$157,564	73	78
PLAN YEAR: 2022			ESTIMATED COST:			\$27,165	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
T-5	Basic Prev.	\$4,189				\$4,189	73	73
R-11	Basic Prev.	\$14,927				\$14,927	75	75
A-11	Basic Prev.	\$8,049				\$8,049	73	74
PLAN YEAR: 2023			ESTIMATED COST:			\$36,614	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
A-11	Basic Prev.	\$11,968				\$11,968	70	70
T-5	Basic Prev.	\$5,065				\$5,065	71	71
R-11	Basic Prev.	\$19,581				\$19,581	73	73
PLAN YEAR: 2024			ESTIMATED COST:			\$50,541	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
A-11	Basic Prev.	\$20,328				\$20,328	66	67
T-5	Basic Prev.	\$6,231				\$6,231	70	70
R-11	Basic Prev.	\$23,982				\$23,982	71	72
PLAN YEAR: 2025			ESTIMATED COST:			\$65,311	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
A-11	Basic Prev.	\$28,747				\$28,747	63	63
T-5	Basic Prev.	\$8,001				\$8,001	68	68
R-11	Basic Prev.	\$28,563				\$28,563	70	70
PLAN YEAR: 2026			ESTIMATED COST:			\$549,774	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
R-11	Prev. & Seal Coat	\$37,406	\$160,895			\$198,302	68	72
A-11	Prev. & Seal Coat	\$37,381	\$69,088			\$106,469	60	67
T-5	Prev. & Thin AC	\$9,736	\$235,267			\$245,003	67	75
PLAN YEAR: 2027			ESTIMATED COST:			\$62,814	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
T-5	Basic Prev.	\$4,653				\$4,653	73	73
R-11	Basic Prev.	\$29,571				\$29,571	70	70
A-11	Basic Prev.	\$28,590				\$28,590	64	64

PLAN YEAR: 2028			ESTIMATED COST:			\$82,337	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
A-11	Basic Prev.	\$37,695				\$37,695	61	61
T-5	Basic Prev.	\$5,688				\$5,688	71	71
R-11	Basic Prev.	\$38,954				\$38,954	69	69
PLAN YEAR: 2029			ESTIMATED COST:			\$104,930	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
T-5	Basic Prev.	\$6,803				\$6,803	70	70
A-11	Basic Prev.	\$50,030				\$50,030	58	58
R-11	Basic Prev.	\$48,097				\$48,097	67	67
PLAN YEAR: 2030			ESTIMATED COST:			\$1,254,725	PCI	
SectionID	Maintenance	Local	Global	Major<Crit	Major>Crit	Total	before	after
A-11	Reconstruct			\$1,188,607		\$1,188,607	55	100
T-5	Basic Prev.	\$8,881				\$8,881	68	69
R-11	Basic Prev.	\$57,237				\$57,237	66	66