

MONUMENT MUNICIPAL AIRPORT

This report describes how your Pavement Maintenance Management Program (PMMP) was developed. Your Program was developed as part of the Oregon Continuous Aviation System Plan sponsored in part by the Oregon Department of Aviation and the Federal Aviation Administration (FAA). The information and data contained in this report ensures you are in compliance with the requirements of FAA Grant Assurance Number 11 which states that any airport requesting federal funds for pavement improvement projects must have implemented a pavement maintenance management program.

DATA COLLECTION

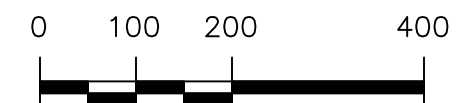
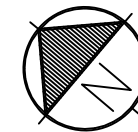
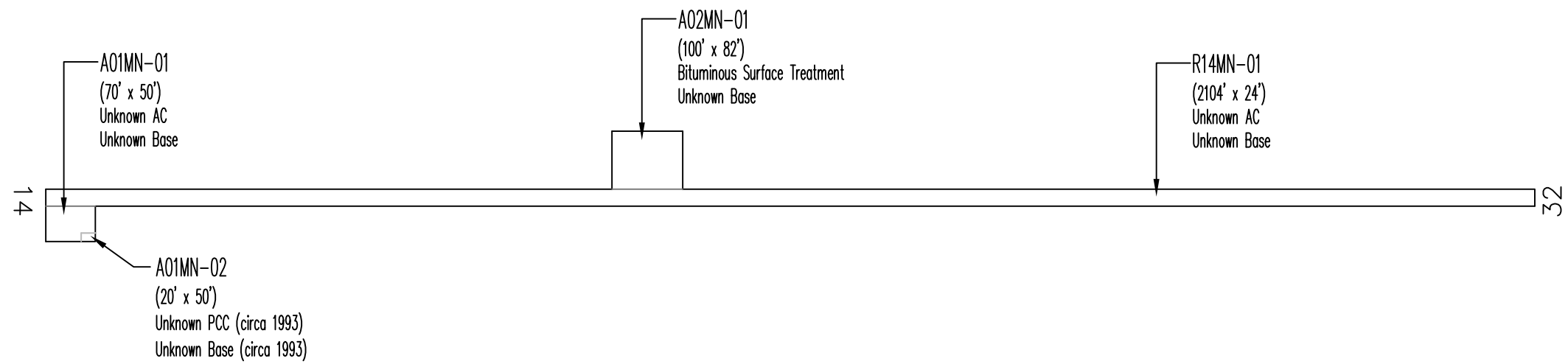
To determine how your pavements were constructed and their age, a records review was conducted. Figure MN-1 shows the records review results. This figure identifies pavement boundaries, dimensions, pavement layer types, thicknesses and dates of construction. The most recent construction date for each pavement can also be found in the Section Condition Report in Appendix 2. Figure MN-1 and the information contained in Appendices 1, 2 and 4 ensure that your airport complies with the “pavement inventory” requirement of FAA’s PMMP guidelines.

The pavements at your airport were divided into branches, sections and sample units in accordance with the methodology outlined in the current edition of ASTM D5430, *Standard Test Method for Airport Condition Index Surveys*. The branches, sections and sample units established at your airport are shown in Figure MN-2. A Branch Condition Report showing all branches, their associated areas, and their area-weighted average condition is provided in Appendix 1. Additionally, the Appendix 2 Section Condition Report provides information used to define each branch and section in the Micro PAVER database.

Using the branch, section and sample unit divisions established, a visual condition survey was conducted at Monument Municipal Airport in August 2014. During the inspection, pavement defects were identified and measured in accordance with the methodology outlined in ASTM D5430. This inspection ensures your airport complies with the “detailed inspection” requirement of FAA’s PMMP guidelines. After collection, the data were entered into the Micro PAVER software for analysis. These data are reproduced in the Re-Inspection Report attached as Appendix 4.

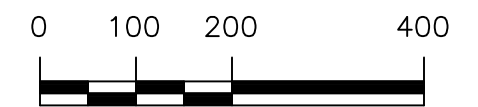
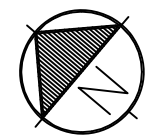
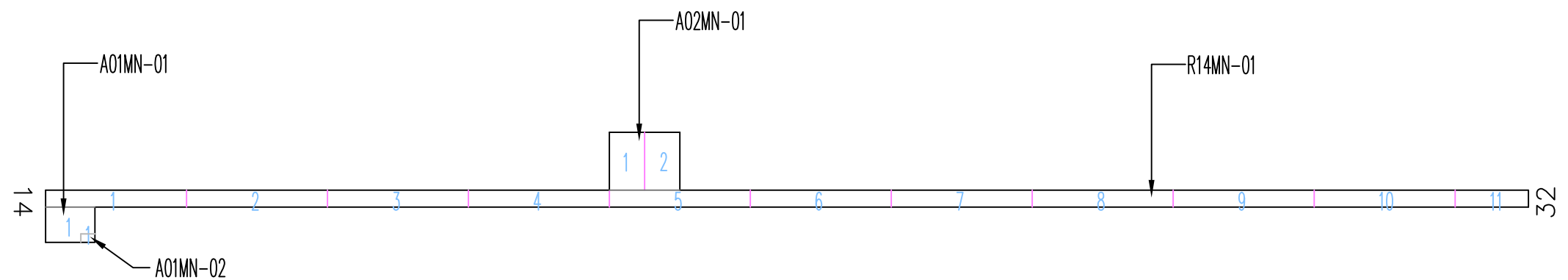
The Micro PAVER database updated during this project ensures your airport complies with the “record keeping and information retrieval” requirements of FAA’s PMMP guidelines.

Figure MN-1. Airport Layout, Dimensions and Pavement Cross-Sections.
Monument Municipal Airport



Drawing Date: August 2014

Figure MN-2. Pavement Branch, Section and Sample Unit Layout.
Monument Municipal Airport



Drawing Date: August 2014

RESULTS

Using the data collected during the visual inspection, the Micro PAVER software was used to calculate an area-weighted average Pavement Condition Index (PCI) for each pavement section inspected using the sample units evaluated. Using each section's PCI, a Pavement Condition Rating (PCR) was assigned. The PCIs measured during this inspection are shown in Table 1. The table also contains PCIs from past inspections as well as projected PCIs for 2019 and 2024. The projections were based on pavement deterioration models developed by Micro PAVER using the inspection data from other pavements in the same airport category as your airport, located in the same climatic region, and with the same surface type and use.

The Branch Condition Report in Appendix 1 summarizes current pavement condition by branch while the Section Condition Report in Appendix 2 lists pavement condition by section. The current PCR is shown graphically in Figure MN-3.

Table 1. Past, Present and Future Pavement Condition Indices.

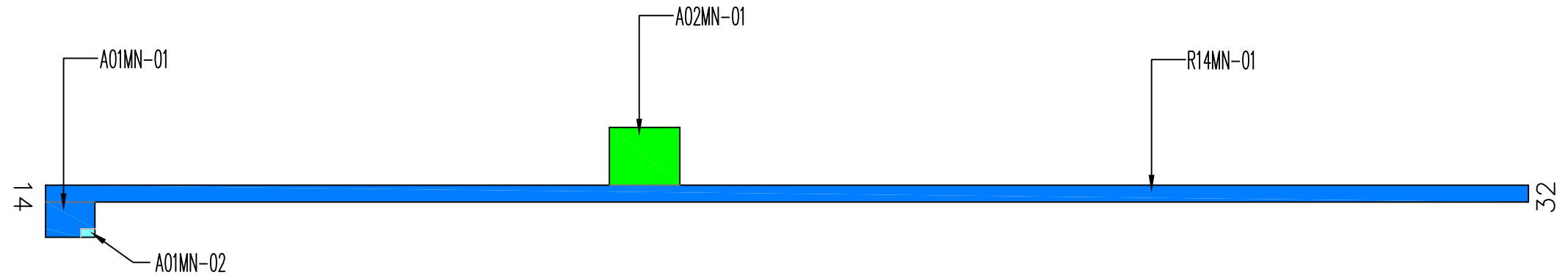
Branch	Section	Inspections			Forecast	
		2006	2011	2014	2019	2024
A01MN	01	100	81	70	68	67
A01MN	02	-	2	72	60	57
A02MN	01	30	20	43	36	32
R14MN	01	100	83	70	56	41

Section PCIs at Monument Municipal Airport range from a low of 42 (a PCR of "Poor") to a high of 72 (a PCR of "Satisfactory"). The area-weighted average PCI for all airport pavements is 66, corresponding to an overall PCR of "Fair". Figure MN-4 shows how much pavement area is associated with each Pavement Condition Rating category and also shows pavement condition distribution from the inspections conducted in 2006 and 2011.

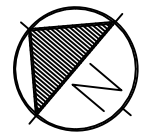
The primary distresses observed during the inspection asphalt concrete pavements were: longitudinal and transverse cracking, block cracking, raveling, and swell. The primary distress observed during the inspection of portland cement concrete pavement was corner spalls.

A graphical representation of the projected PCIs listed in Table 1 is shown in Figure MN-5.

Figure MN-3. Pavement Condition in August 2014.
 Monument Municipal Airport

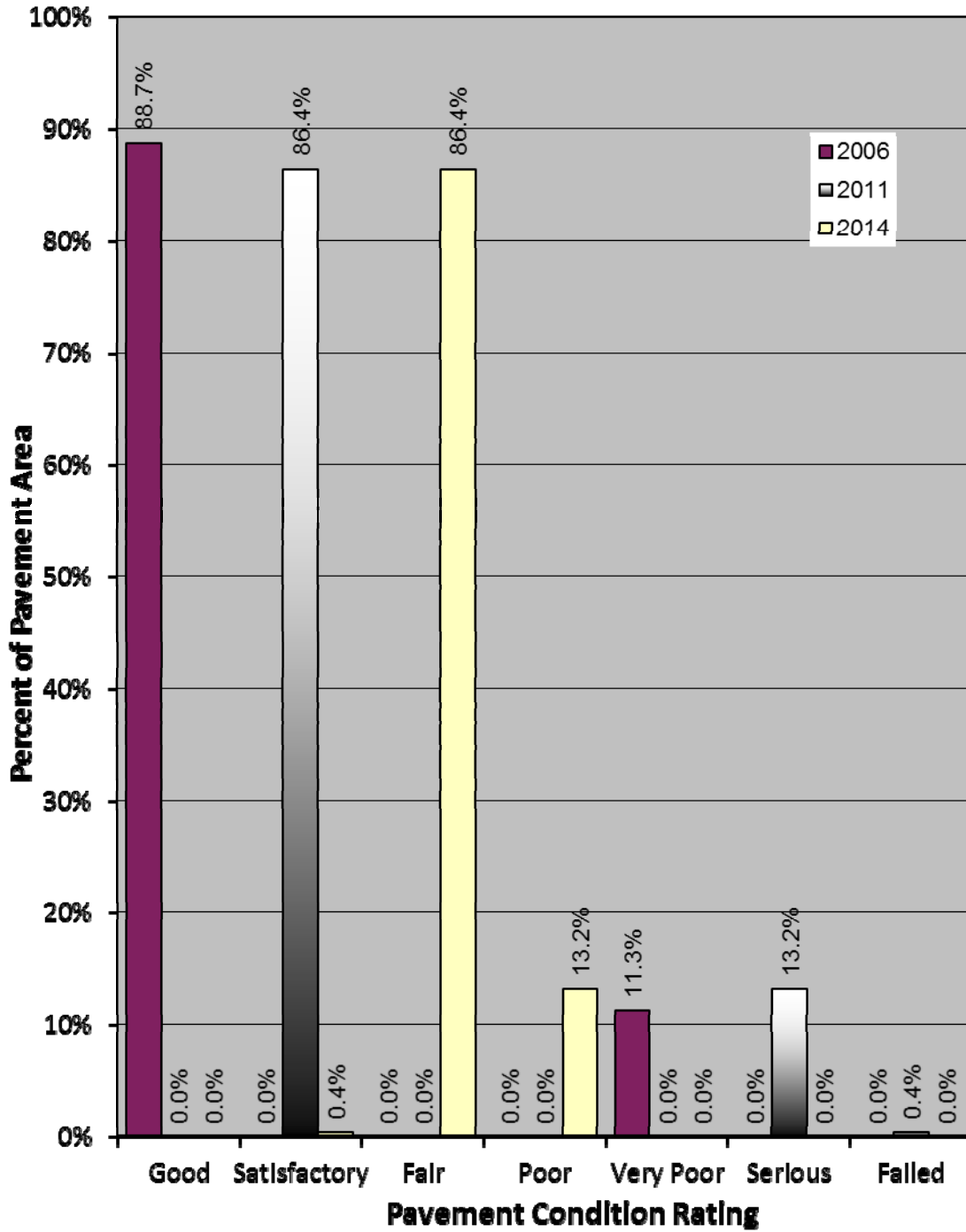


PCI	PCR
100	GOOD
85	SATISFACTORY
70	FAIR
55	POOR
40	VERY POOR
25	SERIOUS
10	FAILED
0	



Drawing Date: August 2014

**Figure MN-4. Distribution of Pavement Condition
Monument Municipal Airport**

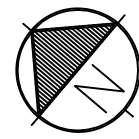


Predicted Condition in 2019.



PCI	PCR
100	GOOD
85	SATISFACTORY
70	FAIR
55	POOR
40	VERY POOR
25	SERIOUS
10	FAILED
0	

Predicted Condition in 2024.



Drawing Date: August 2014



Figure MN-5. Future Pavement Condition.

RECOMMENDATIONS

Data collected during the visual condition survey were used by the Micro PAVER software to generate the Network Maintenance Report contained in Appendix 3. This report identifies, for each pavement section, the recommended localized maintenance activities (i.e.-crack sealing, patching) that should be completed to repair the defects observed during the visual inspection. The repair quantities identified in the report were extrapolated to cover the entire pavement section, based on the distresses measured in the inspected sample units. If the repair activities identified are completed, the pavement deterioration rate will be slowed.

The recommended localized maintenance activities to be applied are selected by the Micro PAVER software based on a Distress Maintenance Policy established for the Oregon airport system. The report results indicate that, over your entire airport, the following quantities of localized maintenance are needed:

- 3,179 linear feet of asphalt concrete crack sealing

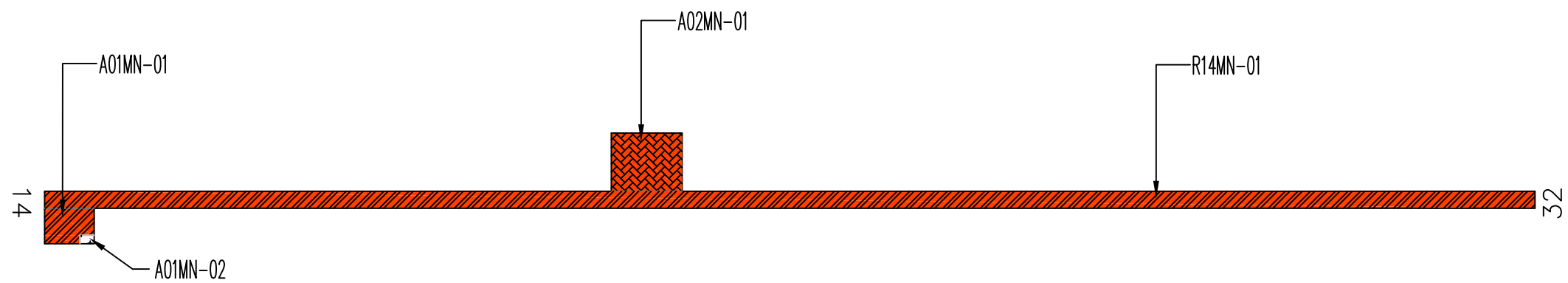
The Micro PAVER software can also identify and schedule recommended global (applied over an entire section) maintenance activities such as fog seals, slurry seals and other surface treatments, as well as major rehabilitation activities such as asphalt concrete overlays and complete reconstruction. Micro PAVER schedules global maintenance on a user-defined interval. To schedule major rehabilitation Micro PAVER uses pavement deterioration models developed during this project. These models are used to estimate future pavement condition and to schedule rehabilitation based on a trigger PCI.

During this project a 5-year program outlining recommended global maintenance and rehabilitation was developed. The program begins in the year 2015 to allow time for project development. These recommendations are presented in Table 2, which identifies the pavement section requiring rehabilitation, the year the action should be completed, the type of action, and an associated cost. This information is also presented graphically in Figure MN-6.

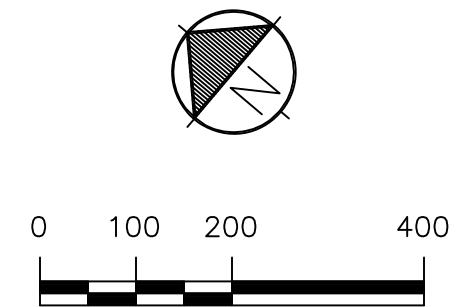
Table 2. Five-Year Global Maintenance and Rehabilitation Plan.

Year	Branch	Section	Action	Area (sf)	Unit Cost (\$/sf)	Total Cost (\$)
2015	A01MN	1	Slurry Seal	3,260	\$0.20	\$652
2015	A02MN	1	Reconstruct with 2" AC / 6" Crushed Aggregate Base / 12" Subbase	8,200	\$9.00	\$73,800
2015	R14MN	1	Slurry Seal	50,496	\$0.20	\$10,099
2015 Total						\$84,551
TOTAL						\$84,551

Figure MN-6. Five-Year Pavement Management Plan.
Monument Municipal Airport



ACTION TIMING		ACTION	
	2015		FOG SEAL
	2016		SLURRY SEAL
	2017		OVERLAY
	2018		RECONSTRUCT
	2019		ROUTINE MAINTENANCE



If the global maintenance and/or rehabilitation activities recommended in Table 2 are not completed, the localized maintenance activities identified in the Network Maintenance Report (Appendix 3) for that section should be done. Additionally, for those sections not listed in Table 2 as requiring global maintenance or rehabilitation, the localized maintenance activities outlined in the Network Maintenance Report should be completed. By completing the localized maintenance activities, pavement condition is improved, life is extended, deterioration is slowed and the length of time until major repair or rehabilitation is required is increased.

INSPECTION SCHEDULE

To comply with the inspection schedule requirement of FAA Grant Assurance Number 11, a detailed visual inspection should be conducted every 3 years using the methodology described in ASTM D5430. The next scheduled detailed visual inspection should take place in 2017.

In addition, the FAA requires that a drive-by inspection be conducted monthly to detect unforeseen changes in pavement condition. The results of each drive-by inspection should be recorded and kept in a file. At a minimum, the date of the inspection and an indication of any maintenance performed since the last drive-by inspection should be recorded.

Appendix 1
Branch Condition Report

Date: 9 /16/2014

Branch Condition Report

1 of 2

Pavement Database: ODA2014 NetworkID: Monument

Branch ID	Number of Sections	Sum Section Length (Ft)	Avg Section Width (Ft)	True Area (SqFt)	Use	Average PCI	PCI Standard Deviation	Weighted Average PCI
A01MN (Apron 01 Monument)	2	90.00	31.00	3,500.00	APRON	71.00	1.00	70.14
A02MN (Apron 02 Monument)	1	100.00	82.00	8,200.00	APRON	43.00	0.00	43.00
R14MN (Rwy 14/32 Monument)	1	2,104.00	24.00	50,496.00	RUNWAY	70.00	0.00	70.00

Use Category	Number of Sections	Total Area (SqFt)	Arithmetic Average PCI	Average PCI STD.	Weighted Average PCI
APRON	3	11,700.00	61.67	13.22	51.12
RUNWAY	1	50,496.00	70.00	0.00	70.00
All	4	62,196.00	63.75	12.01	66.45

Appendix 2
Section Condition Report

Date: 9 /16/2014

Section Condition Report

1 of 2

Pavement Database: ODA2014 NetworkID: Monument

Branch ID	Section ID	Last Const. Date	Surface	Use	Rank	Lanes	True Area (SqFt)	Last Inspection Date	Age At Inspection	PCI
A01MN (Apron 01 Monument)	01	01/01/1901	AC	APRON	P	0	3,260.00	08/09/2014	113	70.00
A01MN (Apron 01 Monument)	02	09/01/1993	PCC	APRON	P	0	240.00	08/09/2014	21	72.00
A02MN (Apron 02 Monument)	01	09/01/1993	ST	APRON	P	0	8,200.00	08/09/2014	21	43.00
R14MN (Rwy 14/32 Monument)	01	01/01/1901	AC	RUNWAY	P	0	50,496.00	08/09/2014	113	70.00

Section Condition Report*Pavement Database: ODA2014*

Age Category	Average Age At Inspection	Total Area (SqFt)	Number of Sections	Arithmetic Average PCI	PCI Standard Deviation	Weighted Average PCI
21-25	21.00	8,440.00	2	57.50	14.50	43.82
over 40	113.00	53,756.00	2	70.00	0.00	70.00
All	67.00	62,196.00	4	63.75	12.01	66.45

Appendix 3
Network Maintenance Report

**Network Maintenance Report 2014
Monument Municipal Airport**

Network	Branch	Section	Distress	Severity	Action	Maint. Quantity	Unit	Unit Cost	Work Cost	Section Total Cost
Monument	A01MN	1	L & T CR	M	Crack Sealing - AC	220	Ft	\$1.20	\$264	\$264
Monument	R14MN	1	L & T CR	M	Crack Sealing - AC	2,959	Ft	\$1.20	\$3,550	\$3,550
									TOTAL	\$3,814

Appendix 4
Re-Inspection Report

Re-inspection Report

ODA2014

Report Generated Date: September 17, 2014

Network: Monument Name: Monument Municipal

Branch: A01MN Name: Apron 01 Monument Use: APRON Area: 3,500.00SqFt

Section: 01 of 2 From: Northeast End of Runway To: - Last Const.: 01/01/1901
Surface: AC Family: OR-Cat5-AC-East-AP-2014 Zone: 12S Category: O Rank: P
Area: 3,260.00SqFt Length: 70.00Ft Width: 50.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 08/09/2014 Total Samples: 1 Surveyed: 1

Conditions: PCI : 70

Inspection Comments:

Sample Number: 01 Type: R Area: 3,260.00SqFt PCI = 70

Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING M 220.00 Ft Comments:

Re-inspection Report

ODA2014

Report Generated Date: September 17, 2014

Network: Monument Name: Monument Municipal

Branch: A01MN Name: Apron 01 Monument Use: APRON Area: 3,500.00SqFt

Section: 02 of 2 From: - To: - Last Const.: 09/01/1993
Surface: PCC Family: OR-Cat5-PCC-East-AP-2014 Zone: 12S Category: O Rank: P
Area: 240.00SqFt Length: 20.00Ft Width: 12.00Ft
Slabs: 1 Slab Width: 20.00Ft Slab Length: 12.00Ft Joint Length: 0.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 08/09/2014 Total Samples: 1 Surveyed: 1

Conditions: PCI : 72

Inspection Comments:

Sample Number: 01 Type: R Area: 1.00Slabs PCI = 72

Sample Comments:

75 CORNER SPALLING M 1.00 Slabs Comments:

Re-inspection Report

ODA2014

Report Generated Date: September 17, 2014

Network: Monument Name: Monument Municipal

Branch: A02MN Name: Apron 02 Monument Use: APRON Area: 8,200.00SqFt

Section: 01 of 1 From: - To: - Last Const.: 09/01/1993
Surface: ST Family: OR-Cat5-ST-East-AP-2015 Zone: 12S Category: O Rank: P
Area: 8,200.00SqFt Length: 100.00Ft Width: 82.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 08/09/2014 Total Samples: 2 Surveyed: 2

Conditions: PCI : 43

Inspection Comments:

Sample Number: 01 Type: R Area: 4,100.00SqFt PCI = 43
Sample Comments: 52 RAVELING M 4,100.00 SqFt Comments:

Sample Number: 02 Type: R Area: 4,100.00SqFt PCI = 43
Sample Comments: 52 RAVELING M 4,100.00 SqFt Comments:

Re-inspection Report

ODA2014

Report Generated Date: September 17, 2014

Network: Monument Name: Monument Municipal

Branch: R14MN Name: Rwy 14/32 Monument Use: RUNWAY Area: 50,496.00SqFt

Section: 01 of 1 From: - To: - Last Const.: 01/01/1901
Surface: AC Family: OR-Cat5-AC-East-RW-2014 Zone: 12S Category: O Rank: P
Area: 50,496.00SqFt Length: 2,104.00Ft Width: 24.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 08/09/2014 Total Samples: 11 Surveyed: 4

Conditions: PCI : 70

Inspection Comments:

Sample Number: 01 Type: R Area: 4,800.00SqFt PCI = 72

Sample Comments:

43 BLOCK CRACKING L 1,000.00 SqFt Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING M 180.00 Ft Comments:

Sample Number: 04 Type: R Area: 4,800.00SqFt PCI = 70

Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING M 330.00 Ft Comments:

Sample Number: 06 Type: R Area: 4,800.00SqFt PCI = 71

Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING M 295.00 Ft Comments:

Sample Number: 10 Type: R Area: 4,800.00SqFt PCI = 68

Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING M 320.00 Ft Comments:

56 SWELLING L 30.00 SqFt Comments: