Your Airport Report

TOLEDO STATE 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

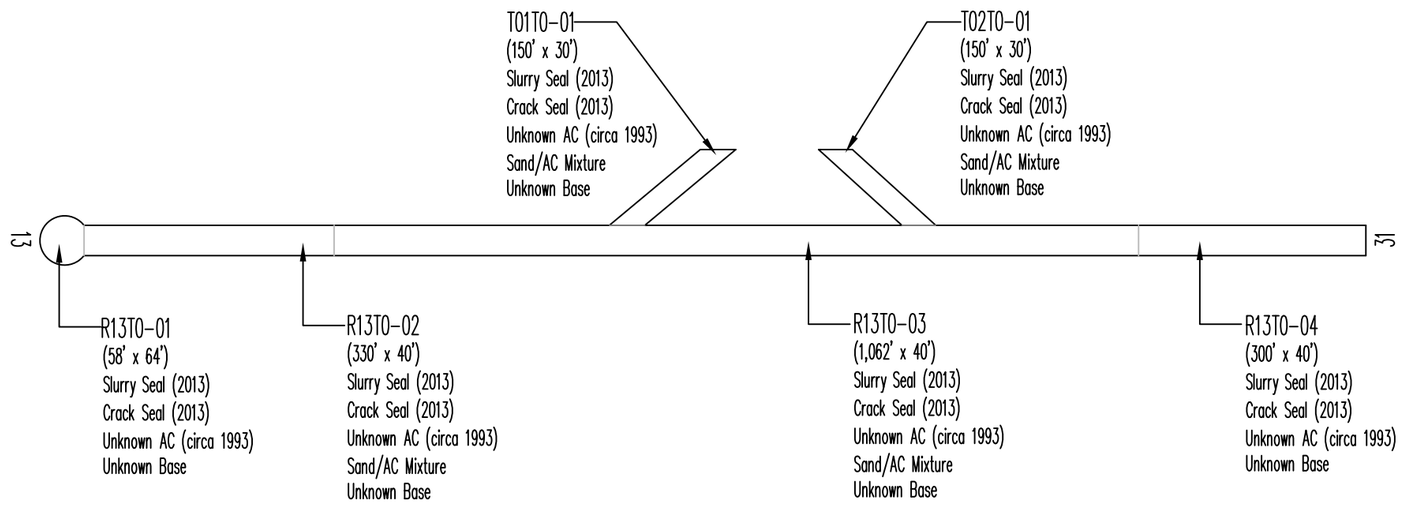
To determine how your pavements were constructed and their age, a records review was conducted. Figure TO-1 shows the records review results. This figure identifies pavement boundaries, dimensions, pavement layer types, thicknesses and dates of construction. The most recent construction date for each pavement can also be found in the Section Condition Report in Appendix 2. Figure TO-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.

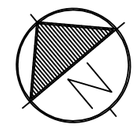
The pavements at your airport were divided into branches, sections and sample units in accordance with the methodology outlined in the current edition of ASTM D5430, *Standard Test Method for Airport Condition Index Surveys*. The branches, sections and sample units established at your airport are shown in Figure TO-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.

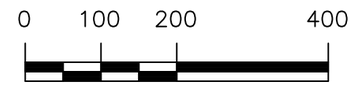
Using the branch, section and sample unit divisions established, a visual condition survey was conducted at Toledo State Airport in September 2015. During the inspection, pavement defects were identified and measured in accordance with the methodology outlined in ASTM D5430. This inspection ensures your 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 T0-1. Airport Layout, Dimensions and Pavement Cross-Sections.
Toledo State Airport



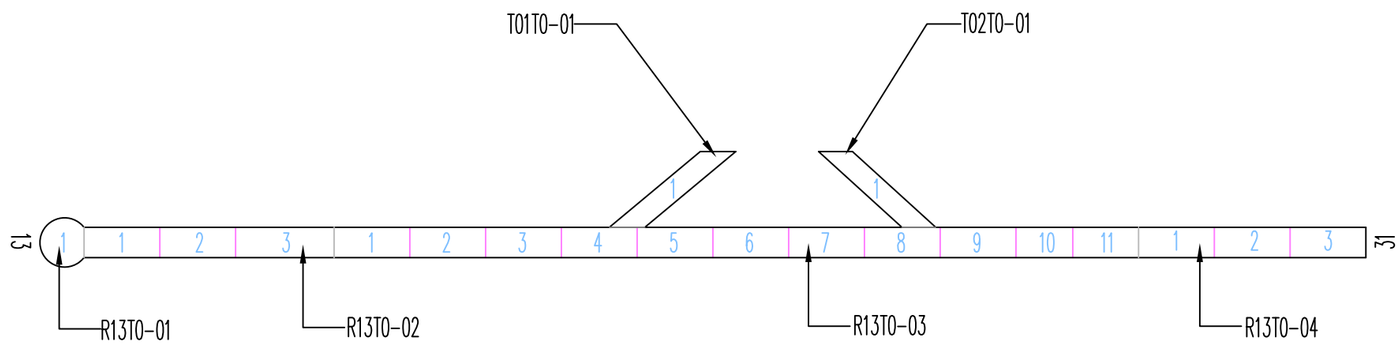


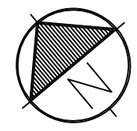


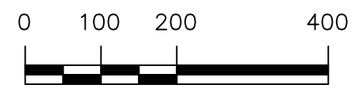
Drawing Date: September 2015

PAVEMENT CONSULTANTS INC.

Figure TO-2. Pavement Branch, Section and Sample Unit Layout.
Toledo State Airport







Drawing Date: September 2015

PAVEMENT CONSULTANTS INC.

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 2020 and 2025. 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 TO-3.

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

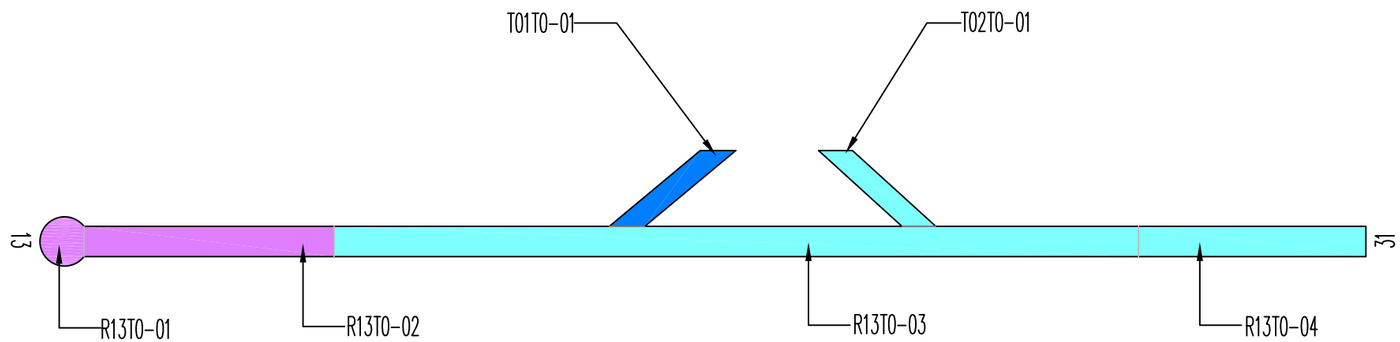
Branch	Section	Inspections			Forecast	
		2008	2012	2015	2020	2025
R13TO	1	70	69	87	74	69
R13TO	2	75	48	91	76	69
R13TO	3	84	77	85	79	78
R13TO	4	53	59	81	71	68
T01TO	1	39	47	68	57	54
T02TO	1	58	63	83	63	55

Section PCIs at Toledo State Airport range from a low of 68 (a PCR of "Fair") to a high of 91 (a PCR of "Good"). The area-weighted average PCI for all airport pavements is 84, corresponding to an overall PCR of "Satisfactory". Figure TO-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 2008 and 2012.

The primary distresses observed during the inspection were: longitudinal and transverse cracking and depressions.

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

Figure TO-3. Pavement Condition in September 2015.
Toledo State Airport



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

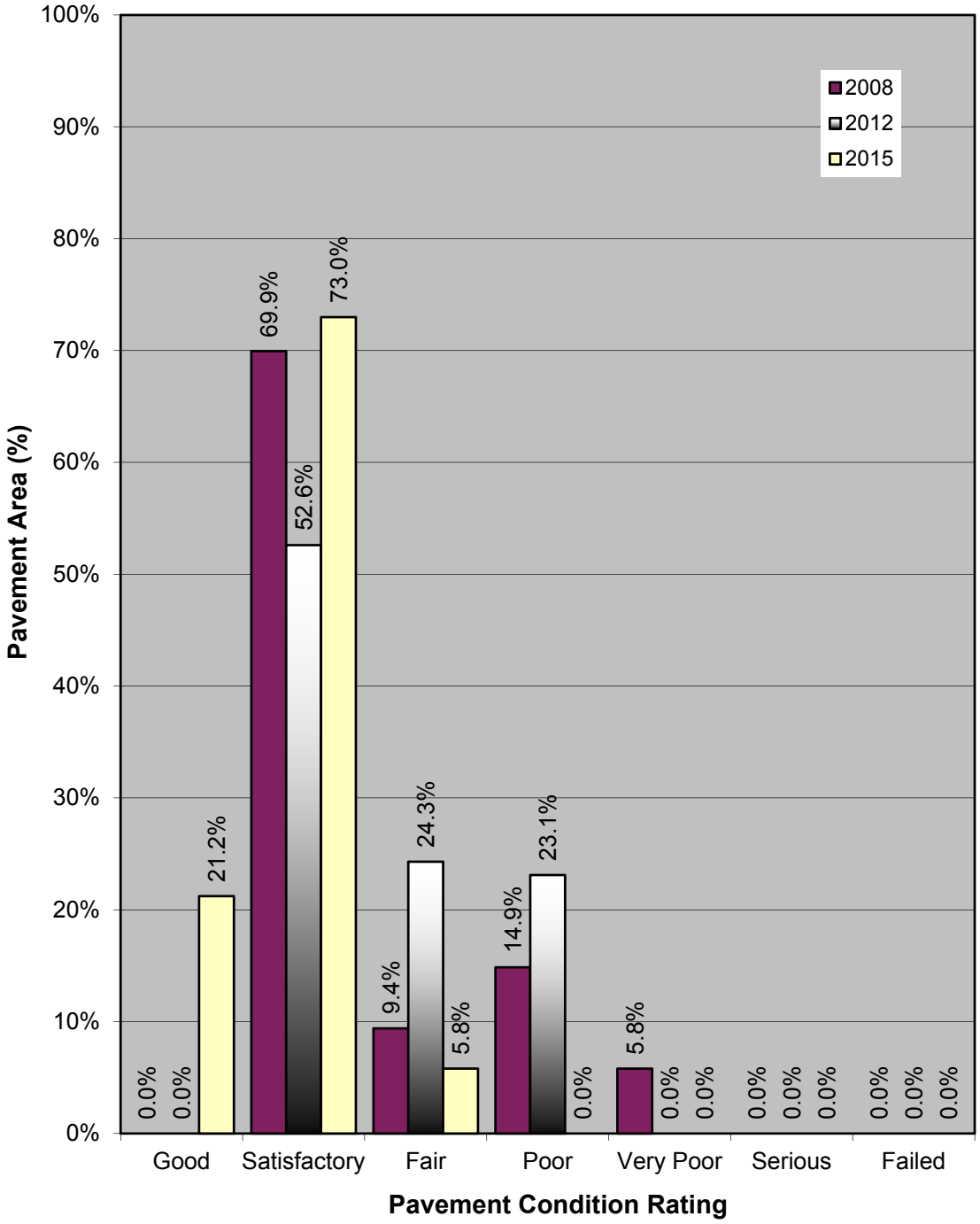
N

0 100 200 400

Drawing Date: September 2015

PAVEMENT CONSULTANTS INC.

Figure TO-4. Pavement Condition Distribution
Toledo State Airport



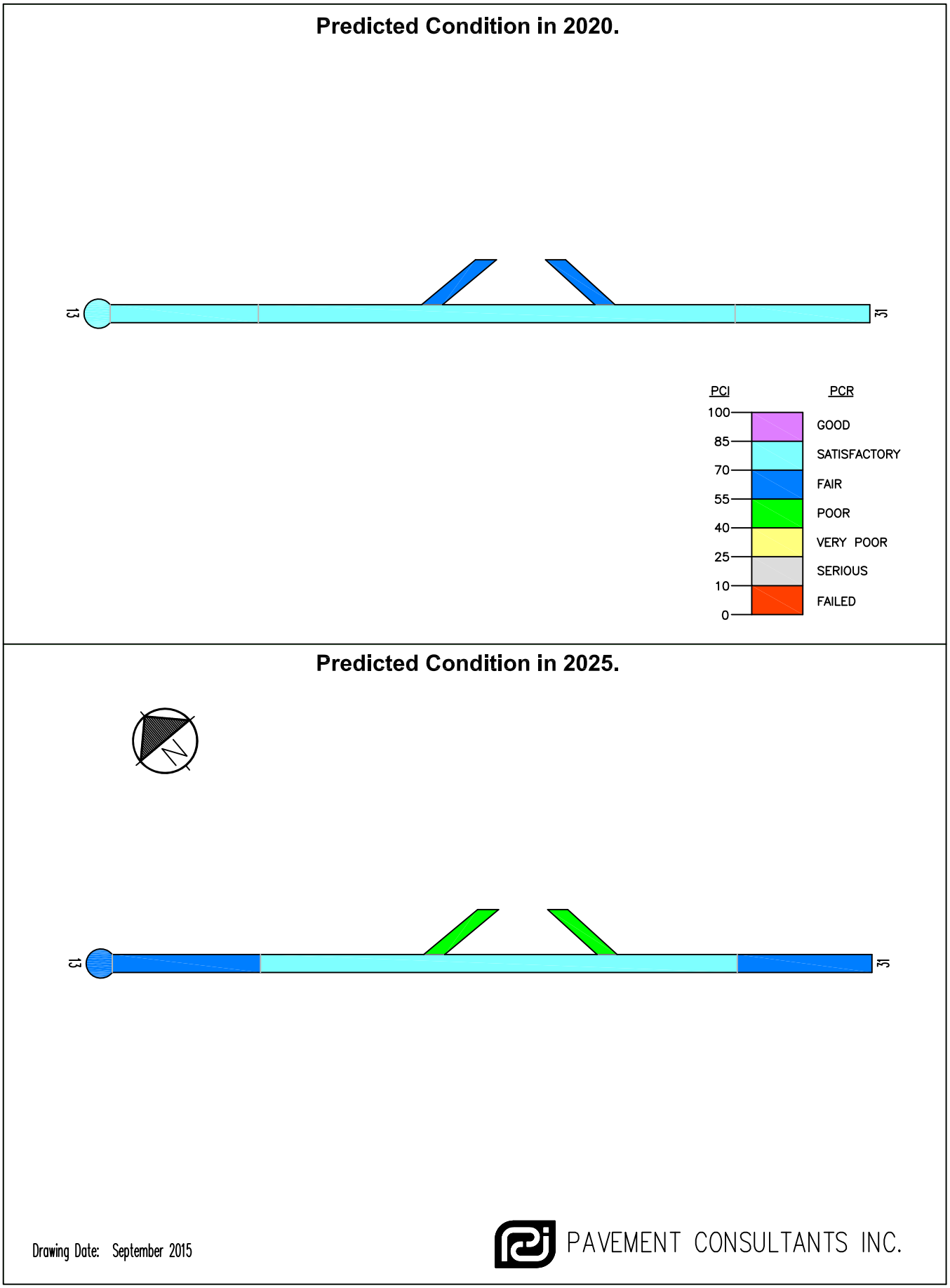


Figure TO-5. Future Pavement Condition.

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, no localized maintenance is needed.

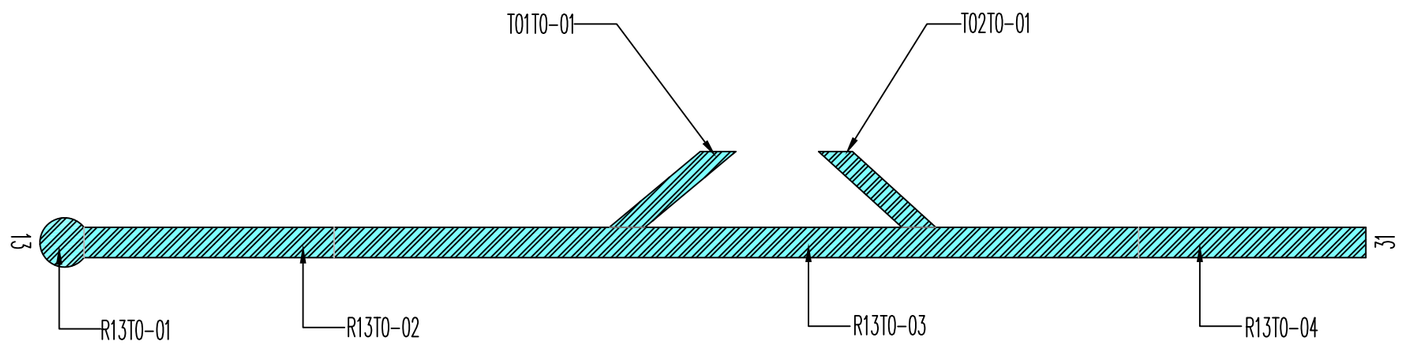
The Micro PAVER software can also identify and schedule recommended global (applied over an entire section) maintenance activities such as fog seals, slurry seals and other surface treatments, as well as major rehabilitation activities such as asphalt concrete overlays and complete reconstruction. Micro 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 2016 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 TO-6.

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

Year	Branch	Section	Action	Area (sf)	Unit Cost ($/sf)	Total Cost ($)
2019	R13TO	1	Slurry Seal	3,130	0.25	$783
2019	R13TO	2	Slurry Seal	14,006	0.25	$3,502
2019	R13TO	3	Slurry Seal	42,480	0.25	$10,620
2019	R13TO	4	Slurry Seal	12,000	0.25	$3,000
2019	T01TO	1	Slurry Seal	4,686	0.25	$1,172
2019	T02TO	1	Slurry Seal	4,460	0.25	$1,115
					2019 Total	**$20,191**
					5-Year Total	**$20,191**

Figure TO-6. Five-Year Pavement Management Plan.
Toledo State Airport



ACTION TIMING

- 2016
- 2017
- 2018
- 2019
- 2020

ACTION

- FOG SEAL
- SLURRY SEAL
- OVERLAY
- RECONSTRUCT
- ROUTINE MAINTENANCE

N

0 100 200 400

Drawing Date: September 2015

PAVEMENT CONSULTANTS INC.

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 2018.

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: 11 /3/2015

Branch Condition Report

Pavement Database: ODA2015 NetworkID: Toledo

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
R13TO (Runway 13/31 Toledo)	4	1,750.00	46.00	71,616.00	RUNWAY	86.00	3.61	85.59
T01TO (Taxiway 01 Toledo)	1	150.00	30.00	4,686.00	TAXIWAY	68.00	0.00	68.00
T02TO (Taxiway 02 Toledo)	1	150.00	30.00	4,460.00	TAXIWAY	83.00	0.00	83.00

Branch Condition Report

Pavement Database: ODA2015

Use Category	Number of Sections	Total Area (SqFt)	Arithmetic Average PCI	Average PCI STD.	Weighted Average PCI
RUNWAY	4	71,616.00	86.00	3.61	85.59
TAXIWAY	2	9,146.00	75.50	7.50	75.31
All	6	80,762.00	82.50	7.21	84.43

Appendix 2
Section Condition Report

Date: 11 /3/2015

Section Condition Report

Pavement Database: ODA2015 *NetworkID: Toledo*

Branch ID	Section ID	Last Const. Date	Surface	Use	Rank	Lanes	True Area (SqFt)	Last Inspection Date	Age At Inspection	PCI
R13TO (Runway 13/31 Toledo)	01	08/01/1993	AC	RUNWAY	P	0	3,130.00	09/17/2015	22	87.00
R13TO (Runway 13/31 Toledo)	02	08/01/1993	AC	RUNWAY	P	0	14,006.00	09/17/2015	22	91.00
R13TO (Runway 13/31 Toledo)	03	08/01/1993	AAC	RUNWAY	P	0	42,480.00	09/17/2015	22	85.00
R13TO (Runway 13/31 Toledo)	04	08/01/1993	AC	RUNWAY	P	0	12,000.00	09/17/2015	22	81.00
T01TO (Taxiway 01 Toledo)	01	08/01/1993	AAC	TAXIWAY	P	0	4,686.00	07/17/2015	22	68.00
T02TO (Taxiway 02 Toledo)	01	08/01/1993	AAC	TAXIWAY	P	0	4,460.00	07/17/2015	22	83.00

Section Condition Report

Pavement Database: ODA2015

Age Category	Average Age At Inspection	Total Area (SqFt)	Number of Sections	Arithmetic Average PCI	PCI Standard Deviation	Weighted Average PCI
21-25	22.00	80,762.00	6	82.50	7.21	84.43
All	22.00	80,762.00	6	82.50	7.21	84.43

Appendix 3
Network Maintenance Report

Network Maintenance Report 2015

Toledo State Airport

Network	Branch	Section	Distress	Severity	Action	Maint. Quantity	Unit	Unit Cost	Work Cost	Section Total Cost
No Localized Maintenance Needed										

Appendix 4
Re-Inspection Report

Re-inspection Report

ODA2015
Report Generated Date: November 03, 2015

Network: Toledo Name: Toledo State

Branch: R13TO Name: Runway 13/31 Toledo Use: RUNWAY Area: 71,616.00SqFt

Section: 01 of 4 From: Runway 13 End To: Section 02 Last Const.: 08/01/1993
Surface: AC Family: OR-Cat5-AC-Central-RW-2015 Zone: 5S4 Category: B Rank: P
Area: 3,130.00SqFt Length: 58.00Ft Width: 64.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 09/17/2015 Total Samples: 1 Surveyed: 1
Conditions: PCI : 87
Inspection Comments:

Sample Number: 01 Type: R Area: 3,130.00SqFt PCI = 87
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	130.00 Ft	Comments:

Re-inspection Report

ODA2015
Report Generated Date: November 03, 2015

Network: Toledo Name: Toledo State

Branch: R13TO Name: Runway 13/31 Toledo Use: RUNWAY Area: 71,616.00SqFt

Section: 02 of 4 From: Section 01 To: Section 03 Last Const.: 08/01/1993
Surface: AC Family: OR-Cat5-AC-Central-RW-2015 Zone: 5S4 Category: B Rank: P
Area: 14,006.00SqFt Length: 330.00Ft Width: 40.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments: Displaced Threshold

Last Insp. Date: 09/17/2015 Total Samples: 3 Surveyed: 2
Conditions: PCI : 91
Inspection Comments:

Sample Number: 01 Type: R Area: 4,000.00SqFt PCI = 89
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	140.00 Ft	Comments:

Sample Number: 02 Type: R Area: 4,000.00SqFt PCI = 94
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	60.00 Ft	Comments:

Re-inspection Report

ODA2015
Report Generated Date: November 03, 2015

Network: Toledo Name: Toledo State

Branch: R13TO Name: Runway 13/31 Toledo Use: RUNWAY Area: 71,616.00SqFt

Section: 03 of 4 From: Section 02 To: Section 04 Last Const.: 08/01/1993
Surface: AAC Family: OR-Cat5-AAC-Central-RW-2015 Zone: 5S4 Category: B Rank: P
Area: 42,480.00SqFt Length: 1,062.00Ft Width: 40.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 09/17/2015 Total Samples: 11 Surveyed: 4
Conditions: PCI : 85
Inspection Comments:

Sample Number: 01 Type: R Area: 4,000.00SqFt PCI = 87
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	165.00	Ft	Comments:

Sample Number: 04 Type: R Area: 4,000.00SqFt PCI = 95
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	40.00	Ft	Comments:

Sample Number: 08 Type: R Area: 4,000.00SqFt PCI = 76
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	260.00	Ft	Comments:
45 DEPRESSION	M	60.00	SqFt	Comments:

Sample Number: 09 Type: R Area: 4,000.00SqFt PCI = 83
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	240.00	Ft	Comments:

Re-inspection Report

ODA2015
Report Generated Date: November 03, 2015

Network: Toledo Name: Toledo State

Branch: R13TO Name: Runway 13/31 Toledo Use: RUNWAY Area: 71,616.00SqFt

Section: 04 of 4 From: Section 03 To: Runway 31 End Last Const.: 08/01/1993
Surface: AC Family: OR-Cat5-AC-Central-RW-2015 Zone: 5S4 Category: B Rank: P
Area: 12,000.00SqFt Length: 300.00Ft Width: 40.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 09/17/2015 Total Samples: 3 Surveyed: 2
Conditions: PCI : 81
Inspection Comments:

Sample Number: 01 Type: R Area: 4,000.00SqFt PCI = 96
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	21.00 Ft	Comments:	

Sample Number: 02 Type: R Area: 4,000.00SqFt PCI = 67
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	320.00 Ft	Comments:	
45 DEPRESSION	M	150.00 SqFt	Comments:	

Re-inspection Report

ODA2015
Report Generated Date: November 03, 2015

Network: Toledo Name: Toledo State

Branch: T01TO Name: Taxiway 01 Toledo Use: TAXIWAY Area: 4,686.00SqFt

Section: 01 of 1 From: Runway 13/31 To: Gravel Apron Last Const.: 08/01/1993
Surface: AAC Family: OR-Cat5-AAC-Central-TW-2015 Zone: 5S4 Category: B Rank: P
Area: 4,686.00SqFt Length: 150.00Ft Width: 30.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/17/2015 Total Samples: 1 Surveyed: 1
Conditions: PCI : 68
Inspection Comments:

Sample Number: 01 Type: R Area: 4,686.00SqFt PCI = 68
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	320.00 Ft	Comments:
45	DEPRESSION	M	150.00 SqFt	Comments:

Re-inspection Report

ODA2015
Report Generated Date: November 03, 2015

Network: Toledo Name: Toledo State

Branch: T02TO Name: Taxiway 02 Toledo Use: TAXIWAY Area: 4,460.00SqFt

Section: 01 of 1 From: Runway 13/31 To: Gravel Apron Last Const.: 08/01/1993
Surface: AAC Family: OR-Cat5-AAC-Central-TW-2015 Zone: 5S4 Category: B Rank: P
Area: 4,460.00SqFt Length: 150.00Ft Width: 30.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/17/2015 Total Samples: 1 Surveyed: 1
Conditions: PCI : 83
Inspection Comments:

Sample Number: 01 Type: R Area: 4,460.00SqFt PCI = 83
Sample Comments:

```
48 LONGITUDINAL/TRANSVERSE CRACKING          L      280.00 Ft       Comments:
```