2022 ODA Pavement Evaluation Program Boardman Airport

Boardman, Oregon

May 8, 2023

Prepared for

State of Oregon Department of Aviation
3040 25th Street SE
Salem, OR 97303-1125

Prepared by

16520 SW Upper Boones Ferry Road, Suite 100
Tigard, OR 97224-7661
(503) 641-3478 | www.gri.com

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1 OVERVIEW

GRI assisted with updating the Oregon Department of Aviation (ODA) airport pavement management system and developing a five-year plan for global maintenance and rehabilitation (M&R) and preservation work for the Boardman Airport in Boardman, Oregon. This project was implemented as a part of the ODA and Federal Aviation Administration (FAA) Oregon Continuous Aviation System Plan. The information provided in this report ensures compliance with FAA Grant Assurance Number 11, which outlines that an airport shall have an effective airport pavement maintenance-management program in place to receive federal financial assistance for the construction, reconstruction, or repair of airport pavements.

GRI conducted surveys of the airside pavement at Boardman Airport in 2022 in accordance with the procedures of Advisory Circular 150/5380-7B and ASTM International (ASTM) D5340. We uploaded the survey data into the PAVER database and used the software to provide a rapid calculation of the pavement condition index (PCI) rating. The PCI is a numerical indicator that defines the functional condition of the pavement based on visual inspection. The scale ranges from zero to 100, where zero represents a pavement in the worst possible condition with no remaining functional life and 100 represents a pavement in the best possible condition with no defects.

2 PAVEMENT INVENTORY

Boardman Airport is located in Boardman, Oregon, and is owned and operated by the Port of Morrow. The airport consists of one runway that serves a variety of general aviation aircraft. The general location of the airport is shown below on the Boardman Airport Location Map, Figure 2.1.

Figure 2.1 - BOARDMAN AIRPORT LOCATION MAP

Boardman Airport contains one runway, one taxilane, two connector taxiways, and one apron. Airside pavements at Boardman Airport include asphalt concrete (AC). The airport pavements, delineated by surface type and branch use, are shown on the Boardman Airport Percent of Pavement Area by Surface Type, Figure 2.2 and on the Boardman Pavement Area by Branch Use, Figure 2.3. The pavement inventory, including work history for each pavement section, is displayed spatially on the Boardman Airport Pavement Inventory, Figure 2.4. The pavement facilities summarized by branch and section are listed in Tables 1A and 2A, respectively, in Appendix A. The sample unit layout for each section is shown on Figure 1A in Appendix A. We used the sampling rates outlined in Table 3A of Appendix A in our survey. The pavement inventory, including work history for individual airport pavement sections, is provided in the work history report in Table 1F.

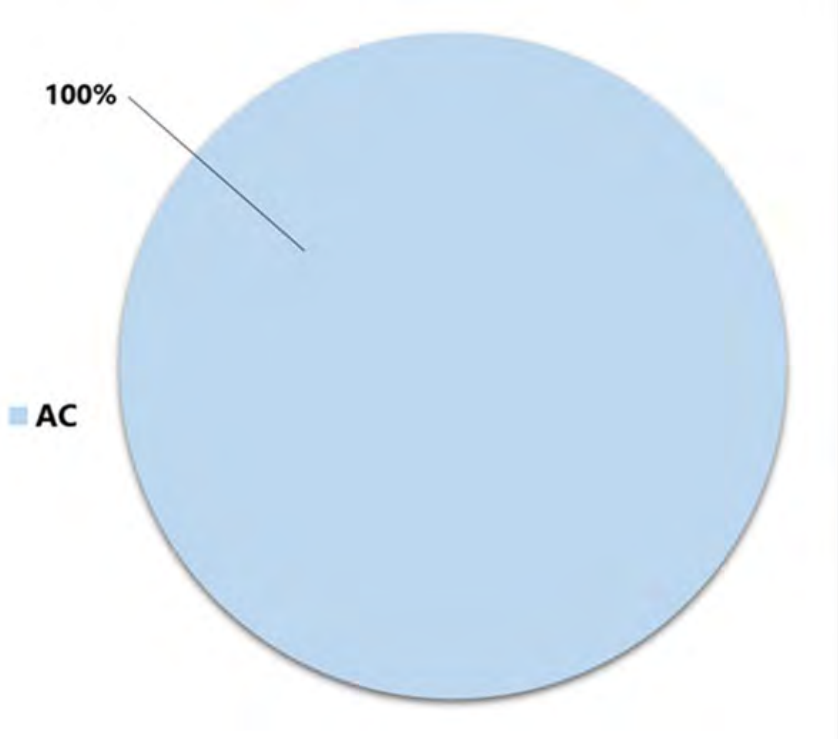


Figure 2.2 - BOARDMAN AIRPORT PERCENT OF PAVEMENT AREA BY SURFACE TYPE

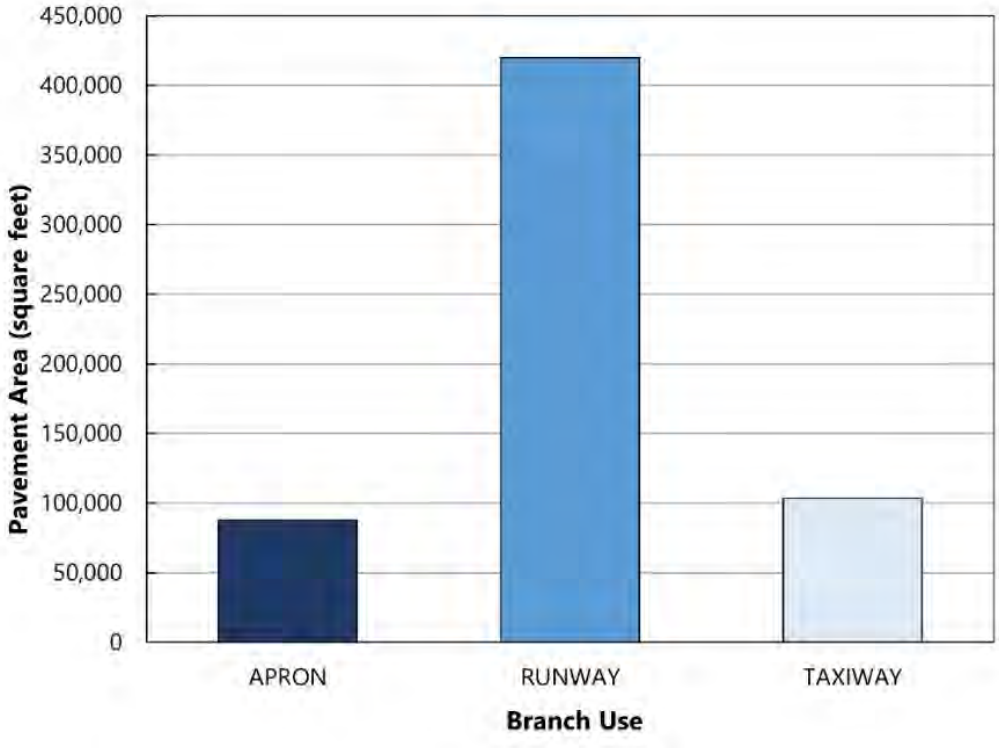
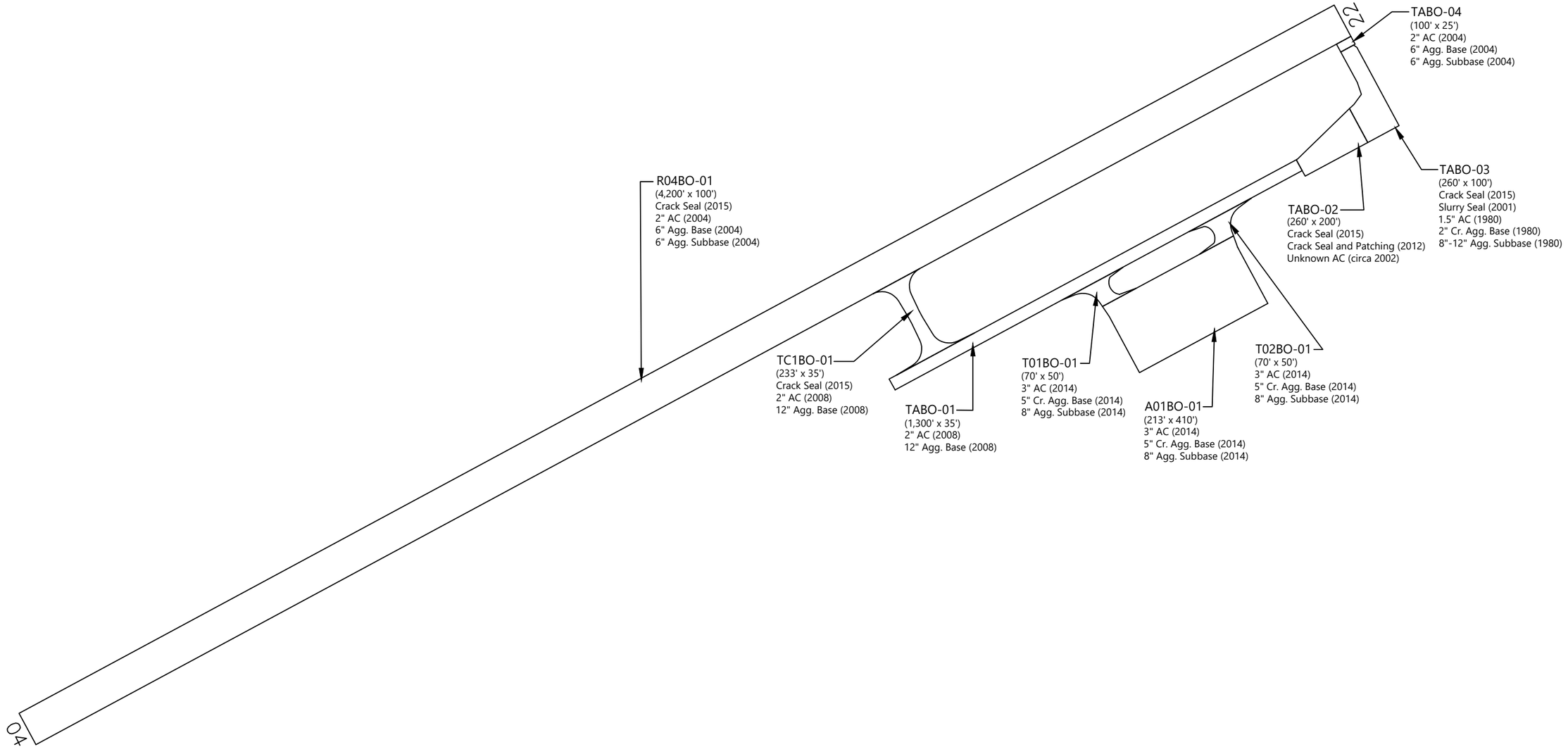
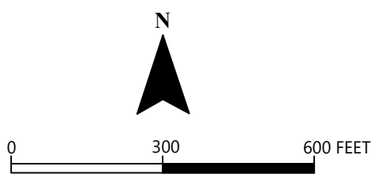


Figure 2.3 - BOARDMAN AIRPORT PAVEMENT AREA BY BRANCH USE



ABBREVIATIONS: AC = ASPHALT CONCRETE; Cr. = CRUSHED; Agg. = AGGREGATE



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STATEWIDE PAVEMENT EVALUATION PROGRA

BOARDMAN AIRPORT PAVEMENT INVENTORY

MAY 2023 JOB NO. 6593-C FIG. 2.4

3 PAVEMENT CONDITION INSPECTION RESULTS

3.1 Introduction

GRI conducted a visual PCI survey of the airside pavements at Boardman Airport in July 2022. The 2022 survey work was performed on sections last inspected in 2017 in order to update the Boardman Airport inspection data. GRI performed the 2022 PCI survey in accordance with the methods described in FAA Advisory Circular 150/5380-6C and ASTM D5340, and further discussed in Appendix B of this report.

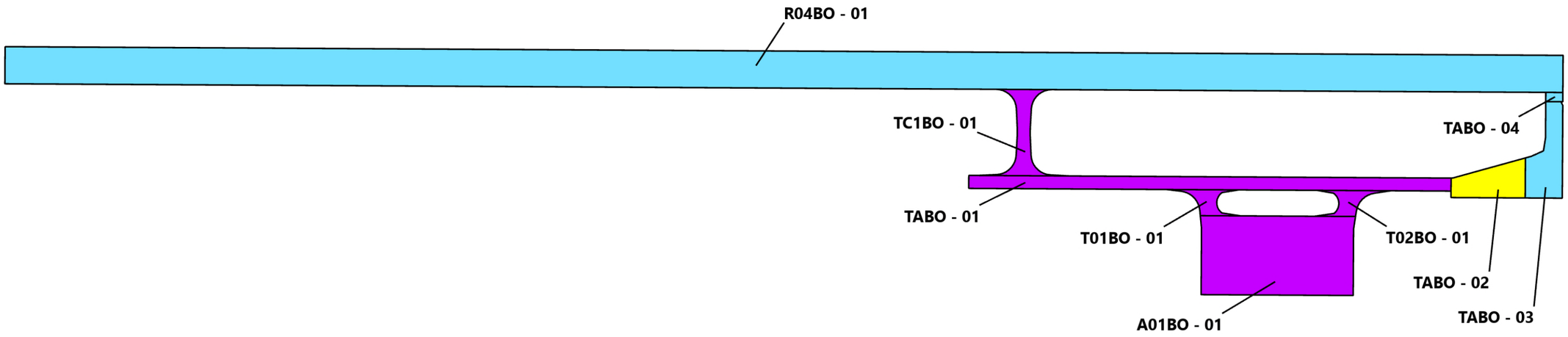
The PCI is based on the type, severity, and quantity of each distress found in an inspected sample unit. Further discussion of distress types for flexible pavement is provided in Appendix B and summarized in Table 1B in Appendix B. The results of the PCI survey are displayed using a seven-category rating scale in accordance with ASTM D5340. Details of the ASTM PCI rating scale are provided in Table 3-1 below.

Table 3-1: ASTM PCI RATING SCALE

PCI Color Legend	PCI Range	PCI Rating and Definition
	86 – 100	GOOD: Pavement has minor or no distresses and should require only routine maintenance.
	71 – 85	SATISFACTORY: Pavement has scattered low-severity distresses that should require only routine maintenance.
	56 – 70	FAIR: Pavement has a combination of generally low- and medium-severity distresses. Maintenance and repair needs may range from routine to major.
	41 – 55	POOR: Pavement has low-, medium-, and high-severity distresses that probably cause some operational problems. M&R needs will be major.
	26 – 40	VERY POOR: Pavement has predominantly medium- and high-severity distresses that cause considerable maintenance and operational problems. M&R needs will be major.
	11 – 25	SERIOUS: Pavement has mainly high-severity distresses that may affect operational safety; immediate repairs are needed.
	0 – 10	FAILED: Pavement deterioration has progressed to the point that safe aircraft operations are no longer possible; complete reconstruction is required.

3.2 Pavement Condition Index Survey Results

The area-weighted average PCI for all airport pavements at Boardman Airport is approximately 81. The section PCIs ranged from a low of 36 to a high of 100. The primary distresses observed on AC-surfaced pavements during the inspection were weathering, longitudinal and transverse cracking, fatigue (alligator) cracking, and patching. Section PCIs following our pavement survey are displayed below spatially on the 2022 PCI Survey Results Boardman Airport, Figure 3.1.



2022 SECTION PCI

- (86 - 100) GOOD
- (71 - 85) SATISFACTORY
- (56 - 70) FAIR
- (41 - 55) POOR
- (26 - 40) VERY POOR
- (11 - 25) SERIOUS
- (0 - 10) FAILED

N

0 300 600 Feet

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2022 PCI SURVEY RESULTS
BOARDMAN AIRPORT

MAY 2023 JOB NO. 6593-C FIG. 3.1

The condition distribution of the network by percent of total pavement area is provided below on the Boardman Airport Pavement Condition Rating by Percent of Area, Figure 3.2. A summary of the pavement condition results by branch and section are included in Tables 2B and 3B of Appendix B, respectively. A comparison between the previous inspection and the 2022 inspection is provided in Table 4B in Appendix B. The re-inspection report that includes inspection details for individual sample units is provided in Table 1E in Appendix E.

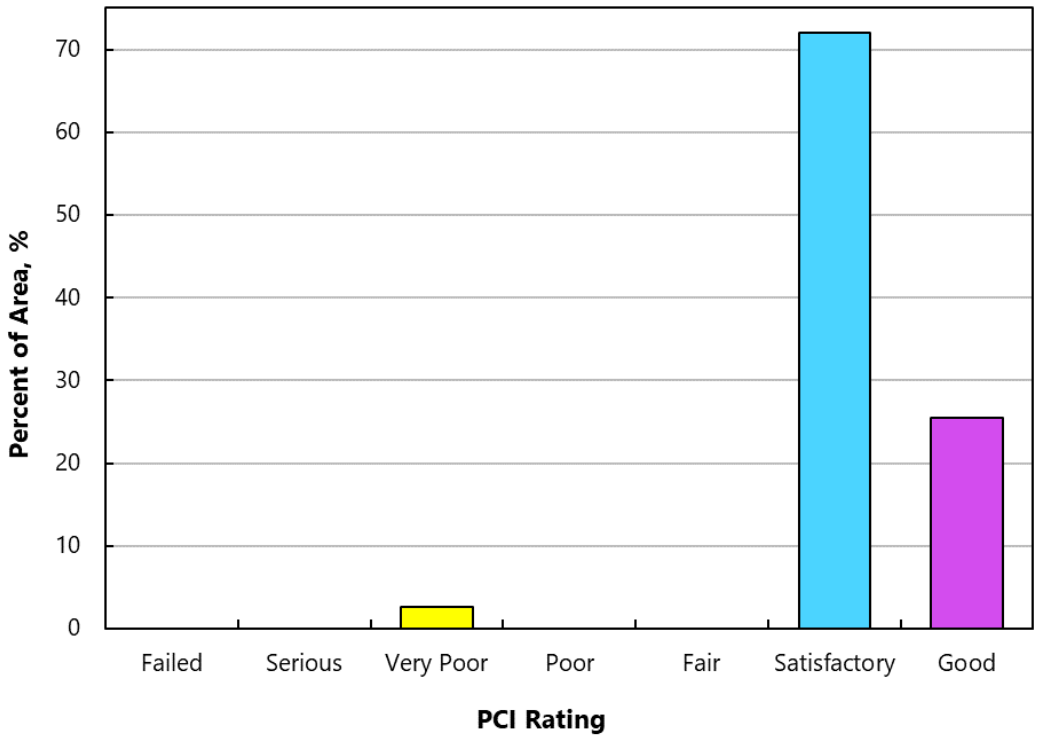


Figure 3.2 - BOARDMAN AIRPORT PAVEMENT CONDITION RATING BY PERCENT OF AREA

4 FUTURE PAVEMENT CONDITION ANALYSIS

4.1 Introduction

In addition to assessing the current condition of a pavement, it is very important from a planning standpoint to be able to predict with reasonable accuracy the future condition. Additional details regarding our future pavement condition analysis, including pavement condition prediction models, are provided in Appendix C. PCI performance curves developed for Boardman Airport are displayed on Figures 1C through 3C in Appendix C.

4.2 Future Condition Analysis

Using the condition prediction models discussed above, the projected condition of each pavement section was determined for 5- and 10-year periods. Based on this analysis, we

project the PCI to decrease from a current value of 81 to a value of 73 in the year 2027 and 66 in year the 2032 if no maintenance or rehabilitation work is performed. The projected pavement condition in five years and ten years for each pavement section at Boardman Airport is displayed spatially on the Future Pavement Condition Boardman Airport, Figure 4.1 and listed in Table 1C in Appendix C, along with the past and present PCI values for the pavement network.

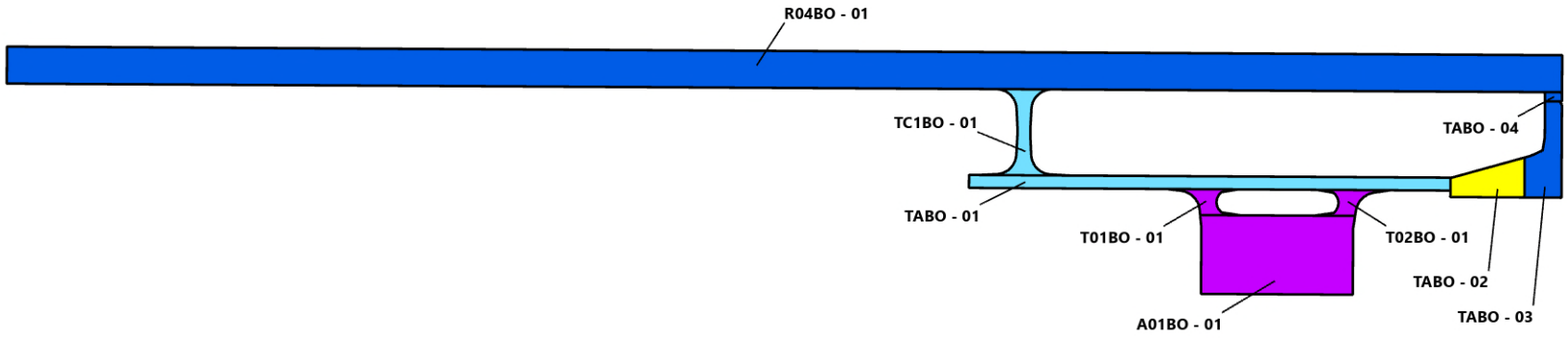
4.3 Functional Remaining Life

The functional remaining life is the practical amount of time a pavement is in service before requiring rehabilitation, as estimated solely based on visual condition. This is not to be confused with structural remaining life, which requires analysis of the structural capacity of a pavement and typically a field exploration and testing program that includes core explorations and falling weight deflectometer (FWD) deflection tests.

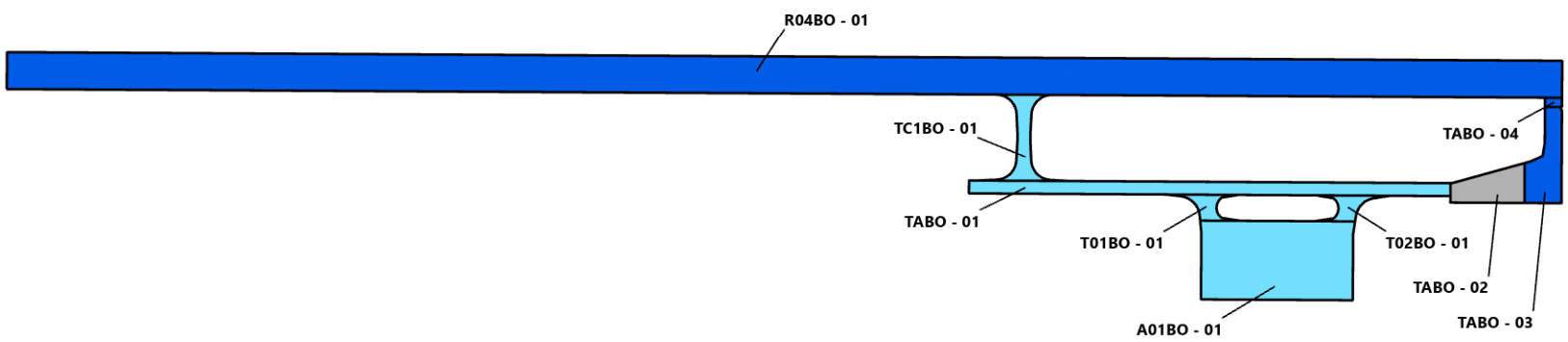
We calculated two forms of functional remaining life based on the current visual condition surveys of the pavement at Boardman Airport. The first type of functional remaining life is the time until rehabilitation, such as an overlay, is needed. The critical PCI, further discussed in Section C.3 of Appendix C, is the threshold used for this type of functional remaining life analysis. The second type of functional remaining life is the time until the pavement is no longer operational due to high foreign object debris (FOD) potential and increased safety concerns for trafficking aircraft. A PCI of 40 was set as the trigger point for the end of the pavement's functional service life with regard to FOD potential.

The two types of functional remaining life for each section at Boardman Airport are summarized in Table 2C in Appendix C.

PREDICTED CONDITION IN 2027

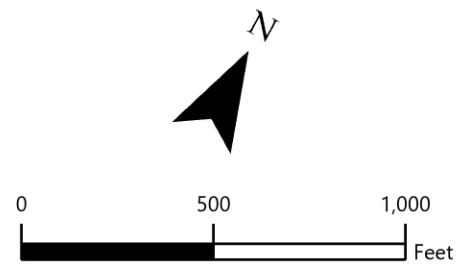


PREDICTED CONDITION IN 2032



SECTION PCI

- (86 - 100) GOOD
- (71 - 85) SATISFACTORY
- (56 - 70) FAIR
- (41 - 55) POOR
- (26 - 40) VERY POOR
- (11 - 25) SERIOUS
- (0 - 10) FAILED



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FUTURE PAVEMENT CONDITION
BOARDMAN AIRPORT

MAY 2023 | JOB NO. 6593-C | FIG. 4.1

5 MAINTENANCE AND REHABILITATION PROJECT RECOMMENDATIONS

5.1 Introduction

We evaluated M&R needs, as determined from the PAVER analysis results, in order to develop localized maintenance, global maintenance, and rehabilitation needs. Details of our M&R work priority and unit costs for work activities are provided in Tables 1D and 2D, respectively, in Appendix D.

Based on the 2022 PCI survey results, shown on Boardman Airport Pavement Network General Treatment Type Distribution Based on PCI, Figure 5.1 displays a breakdown of the Boardman Airport network pavement condition by percent of area and general M&R treatment categories. Approximately 97% and 3% of the area require preservation treatments and reconstruction, respectively.

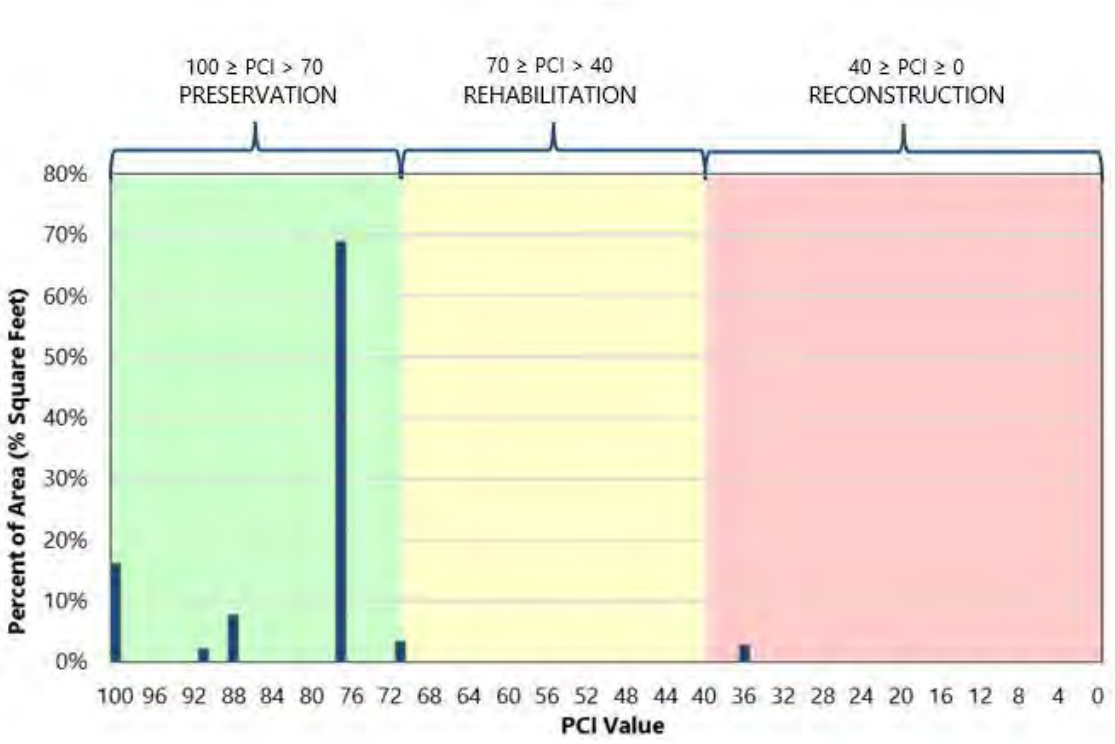


Figure 5.1 - BOARDMAN AIRPORT PAVEMENT NETWORK GENERAL TREATMENT TYPE DISTRIBUTION BASED ON PCI

5.2 Recommended Localized Maintenance

Localized maintenance refers to activities such as crack sealing and patching, which should be performed annually in order to properly maintain aging pavements. Using the PAVER Localized Distress Maintenance Analysis tool, we developed a list of recommended localized maintenance. This list is shown in Table 3D in Appendix D and is independent of the global maintenance and rehabilitation projects associated with the five-year global

maintenance and rehabilitation work plan. A summary of total localized maintenance quantities is provided in Table 5-1 below.

Table 5-1: LOCALIZED MAINTENANCE QUANTITIES

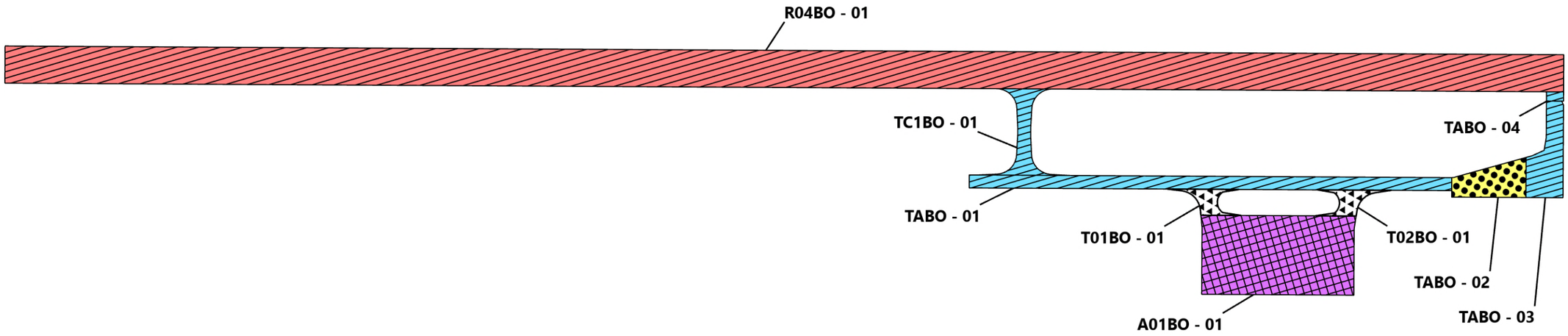
Localized Maintenance Operation	Quantity
Asphalt Concrete Crack Sealing	31,881 linear feet
Asphalt Concrete Wide Crack Sealing	200 linear feet
Asphalt Concrete Full-Depth Patching	621 square feet

5.3 Global Maintenance and Rehabilitation Plan

To develop the five-year work plan, we first ran the eliminate backlog scenario with the PAVER M&R Work Planning Module in order to generate a list, organized by year, of global M&R projects. We then reviewed the project list and refined it into practical construction projects for each year. A summary of global M&R quantities is provided in Table 5-2 below, and maps of the project locations by year are shown on the 5-Year Pavement Management Plan Boardman Airport, Figure 5.2. The complete list of recommended global M&R projects is presented in Table 4D in Appendix D.

Table 5-2: GLOBAL MAINTENANCE AND REHABILITATION QUANTITIES

Global Maintenance or Rehabilitation Operation	Quantity, square feet
Reconstruction	15,942
Fog Seal	87,477
Slurry Seal	497,009



ACTION TIMING

- 2024
- 2025
- 2026
- 2027
- 2028

ACTION

- FOG SEAL
- SLURRY SEAL
- OVERLAY
- RECONSTRUCTION
- ROUTINE MAINTENANCE

N

0 300 600 Feet

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5-YEAR PAVEMENT MANAGEMENT PLAN

BOARDMAN AIRPORT

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6 LIMITATIONS

This report has been prepared to assist the Oregon Department of Aviation (ODA) with pavement-related project planning for the Boardman Airport. The scope is limited to the specific pavement areas described herein. The conclusions and recommendations provided in this report are based on information provided by ODA, estimated costs, and an understanding of the pavement conditions based solely on visual assessment. The global maintenance and rehabilitation recommendations and project selections provided in this report, as well as their corresponding cost estimates, are based on a practical grouping of projects and an estimate of the structural requirements. It is possible that recommendations based on a structural evaluation would differ materially from the recommendations given herein. Therefore, the information included in this report should be used solely for project planning purposes, and it should be understood that rehabilitation costs may vary from the cost estimates given within this report.

Because the condition of the airport pavement network is dynamic, an effective maintenance and rehabilitation program should be reviewed and updated on a regular basis. In addition to regularly surveying and updating the pavement condition, completed construction activities should be tracked in the PAVER database. If Boardman Airport would like to know more about the results presented in this report, please contact the undersigned.

Submitted for GRI,

RENEWS: 06/2023

Lindsi A. Hammond, PE
Principal

Matthew A. Haynes, PE
Project Engineer

Ana-Maria Coca, PhD
Engineering Staff

This document has been submitted electronically.

APPENDIX A

Pavement Inventory Report and Maps

APPENDIX A

PAVEMENT INVENTORY REPORTS AND MAPS

A.1 PAVEMENT NETWORK

Boardman Airport is located in Boardman, Oregon, and is owned and operated by the Port of Morrow. The pavement network/facilities at Boardman Airport serve a variety of general aviation aircraft. Boardman Airport consists of one runway, one taxilane, two connector taxiways, and one apron. The types of airside pavements include asphalt concrete (AC).

The current airport pavement management system (APMS) network at Boardman Airport has an approximate area of 610 thousand square feet of paved airside facilities. The pavement network has previously been divided (by others) into a hierarchical order of branches, sections, and sample units that facilitate inspection and maintenance planning. The pavement facilities summarized by branch and section are listed in Tables 1A and 2A, respectively. Pavement sections and the sample unit layout for each section are shown on Figure 1A in this appendix.

A.2 BRANCHES

A branch, as defined in the PAVER system, is a facility that is a readily identifiable part of a pavement system and has a distinct function. For airports, branches typically consist of individual runways, taxiways, and aprons. The current pavement network for Boardman Airport contains six branches, tabulated in Table 1A and shown on Figure 1A.

A.3 SECTIONS AND SAMPLE UNITS

A pavement section is the smallest management unit used when considering the application and selection of maintenance and rehabilitation (M&R) repairs and treatments and is defined by Section 2.1.8 of ASTM International (ASTM) D5340 as *"a contiguous pavement area having uniform construction, maintenance, usage history, and condition."* All sections should also have the same traffic volume and load intensity. The current pavement network included in the PAVER database for Boardman Airport contains nine sections that are managed by the City of Boardman, which are tabulated in Table 2A and shown spatially on Figure 1A.

PAVER assigns a rank, which designates that pavement's prioritization in receiving maintenance and repair. The highest use or priority pavements, such as runways, taxiways, and terminal aprons, are ranked *Primary*, while the surrounding aprons and shoulders are ranked *Secondary,* and low-use areas are ranked *Tertiary*. The ranks for all sections are shown on Table 2A.

To facilitate the visual survey of the airport pavement, each section is further subdivided into smaller areas called sample units. Similar sizing of these units is critical, and studies have found that maintaining the size of the sample units to within 40% of the established normal distribution reduces the standard error of the average pavement condition index (PCI) values. To meet this criterion, the ASTM method recommends sample units for flexible pavements be 5,000 ± 2,000 square feet. The delineation of sample units for each section is displayed on Figure 1A.

A.4 SAMPLE UNIT DELINEATION

For an APMS survey, a PCI confidence level of 92% and an allowable error (e) of eight PCI points are used for all airport pavements. To determine the number of sample units that need to be inspected to achieve the required confidence level and allowable error, the following equation is used:

$$n = \frac{N \times s^2}{\left(e^2/_4\right)(N-1)+s^2} \qquad \text{(Equation 1)}$$

where:

n = number of sample units to be inspected
N = total number of samples in the pavement sections
e = allowable error
s = section standard deviation

For the 2022 Boardman Airport PCI survey, Table 3A was used as a guideline in developing sampling rates for flexible pavement that reflect similar rates used for other large airport pavement networks. In general, this sampling rate distribution provides a 92% confidence level with a standard error of eight PCI points.

Sample unit locations at Boardman Airport were selected using a systematic random sampling model method. This technique is implemented by first determining the number of sample units needed based on the confidence interval calculated using Equation 1. The first sample unit is randomly placed in the section and then the remaining sample units are systematically spaced throughout the section at an equal distance apart.

Table 1A – BOARDMAN AIRPORT PAVEMENT BRANCHES

Facility Designation (Branch ID)	Branch Name	Number of Sections	Approximate Area, square feet
A01BO	Apron 01 Boardman	1	87,477
R04BO	Runway 4/22 Boardman	1	420,000
T01BO	Taxiway 01 Boardman	1	5,233
T02BO	Taxiway 02 Boardman	1	5,233
TABO	Taxiway A Boardman	4	80,984
TC1BO	Taxiway C1 Boardman	1	11,967

Table 2A - BOARDMAN AIRPORT CURRENT PAVEMENT INVENTORY

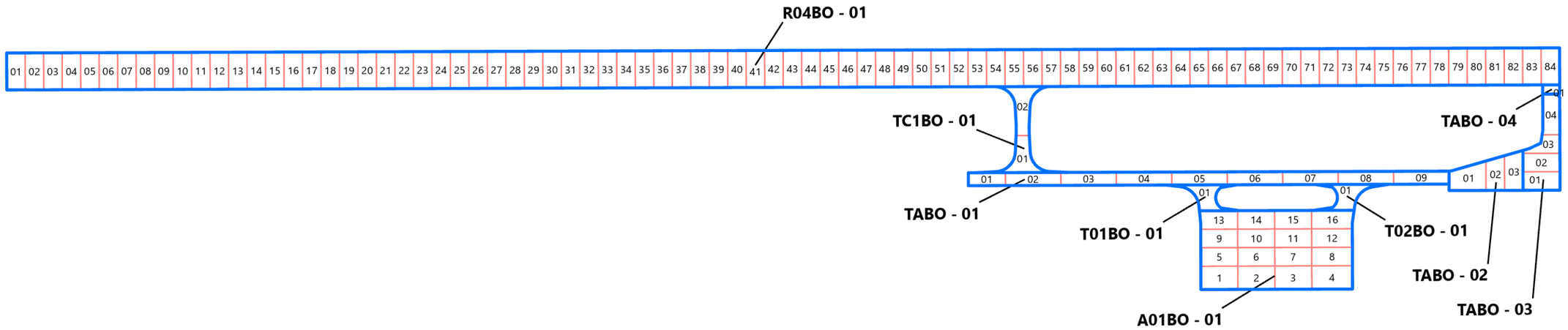
BranchID	Branch Name	Branch Use	SectionID	From	To	Rank	Length, feet	Width, feet	Approximate Area, square feet	LCD	Surface Type
A01BO	Apron 01 Boardman	APRON	01	T02BO	T03BO	P	213	410	87,477	7/15/2014	AC
R04BO	Runway 4/22 Boardman	RUNWAY	01	Runway 04 End	Runway 22 End	P	4,200	100	420,000	9/3/2004	AC
T01BO	Taxiway 01 Boardman	TAXIWAY	01	Taxiway A	Apron	P	70	50	5,233	7/15/2014	AC
T02BO	Taxiway 02 Boardman	TAXIWAY	01	Taxiway A	Apron	P	70	50	5,233	7/15/2014	AC
TABO	Taxiway A Boardman	TAXIWAY	01	Taxiway C1	TA-02	P	1,300	35	45,500	9/2/2008	AC
TABO	Taxiway A Boardman	TAXIWAY	02	TA-01	TA-03	P	200	83	15,942	8/1/2002	AC
TABO	Taxiway A Boardman	TAXIWAY	03	TA-02	TA-04	P	260	46	18,392	9/3/1980	AC
TABO	Taxiway A Boardman	TAXIWAY	04	TA-03	R22 End	P	25	46	1,150	8/3/2004	AC
TC1BO	Taxiway C1 Boardman	TAXIWAY	01	Runway 4/22	Taxiway A	P	233	35	11,967	9/2/2008	AC

Abbreviations:
P = Primary pavement
LCD = Last Construction Date. The date of the last major rehabilitation (e.g. overlay)
AC = Asphalt Concrete

Table 3A: EXAMPLE SAMPLE RATES FOR AC PAVEMENTS

AC Sampling Rate	
Total Number of Sample Units, N	**Sample Units to Survey, n**
1	1
2-3	2
4-6	3
7-13	4
14-38	5
39+	6

Note: AC = Asphalt Concrete



SECTION

SAMPLE UNIT

N

0 300 600

Feet

GRI

SAMPLE UNIT LAYOUT

BOARDMAN AIRPORT

MAY 2023 JOB NO. 6593-C FIG. 1A

APPENDIX B

Pavement Condition Index Survey Results

APPENDIX B

PAVEMENT CONDITION INDEX SURVEY RESULTS

B.1 METHODOLOGY

As previously discussed, the PCI is a measure of the pavement's functional surface condition and provides a methodology for assessing the causes of distress and whether the distress is related to a load or climatic conditions. Although the PCI is not a direct measure of structural capacity, it provides a suggestion of the structural needs of the pavement.

The PCI is based on the type, severity, and quantity of each distress found in an inspected sample unit. The results are displayed using a seven-category rating scale in accordance with ASTM D5340. Flexible pavement (e.g., AC and AAC) distress types are presented in Table 1B. A summary of the pavement condition results by branch and section are included in Tables 2B and 3B of Appendix B, respectively.

Table 1B: PAVER DISTRESS CODES FOR FLEXIBLE PAVEMENT

Flexible Pavement		
PAVER Code	**Pavement Distress**	**Related Cause**
41	Alligator Cracking	Load
42	Bleeding	Other
43	Block Cracking	Climate/ Durability
44	Corrugation	Other
45	Depression	Other
46	Jet Blast	Other
47	Joint Reflection Cracking	Climate/ Durability
48	Longitudinal & Transverse Cracking	Climate/ Durability
49	Oil Spillage	Other
50	Patching	Climate/ Durability
51	Polished Aggregate	Other
52	Raveling	Climate/ Durability
53	Rutting	Load

Flexible Pavement		
PAVER Code	Pavement Distress	Related Cause
54	Shoving	Other
55	Slippage Cracking	Other
56	Swelling	Other
57	Weathering	Climate/ Durability

To obtain the section PCI, we extrapolated the PCI of each selected sample unit over the entire section area. Distresses found in sample units classified as "additional"– defined as nonrepresentative instead of random- are not extrapolated over the entire section but merely added to the extrapolated quantity. The PCI rating scale presented previously in Table 3-1 of Section 3.1 and are based on ASTM D5340.

Section 4.1 of ASTM D5340, governing PCI surveys, offers this caution:

"The PCI is a numerical indicator that rates the surface condition of the pavement. The PCI provides a measure of the **present condition** of the pavement based on the distress observed on the surface of the pavement, which also indicates the structural integrity and surface operational condition (localized roughness and safety). The PCI **cannot** measure structural capacity, nor does it provide a direct measurement of skid resistance or roughness. It provides an objective and rational basis for determining maintenance and repair needs and priorities. Continuous monitoring of the PCI is used to establish the rate of pavement deterioration, which permits early identification of major rehabilitation needs. The PCI provides feedback on pavement performance for validation or improvement of current pavement design and maintenance procedures."

Based on the limitations of the PCI method, it is imperative that engineers and planners treat the PCI as a tool that will assist them during the M&R planning process. Any major project should always be preceded by an up-to-date, detailed, 100% project-level inspection of the pavement in order to reevaluate maintenance needs prior to the project design process.

B.2 DISTRESS TYPES

Distress tends to fall into one of the following four cause categories:

- **Load-related:** Flexible pavement distresses include alligator/fatigue cracking, corrugation, depression, polished aggregate, rutting, and slippage cracking.

- **Climate- and durability-related:** Flexible pavement distresses include bleeding, block cracking, joint reflection cracking, longitudinal and transverse (L&T) cracking, swelling, and raveling/weathering.

- **Moisture- and drainage-related:** Flexible pavement distresses include alligator/ fatigue cracking, depressions, potholes, and swelling.

- **Other factors:** Oil spillage, jet blast erosion, bleeding, patching

As described above, a distress may be the result of more than one cause. For example, depressions may be caused by incorrect compaction during construction or by subgrade softening due to environmental factors. In addition, a distress may be initiated by one cause but may progress to a distress of higher severity by another cause. Therefore, engineering judgment is critical in analyzing the actual cause or causes of the distress.

B.3 PAVEMENT CONDITION INDEX SURVEY RESULTS

The evaluated Boardman Airport pavement network consists of six branches and nine sections. A total of 25 sample units were visually inspected in the field. Data from the inspected sample units was input into the PAVER database, and a resultant PCI for each section was computed. Additional details regarding the PCI and distress types observed for each surveyed sample unit are provided in the re-inspection report, Table 1E, in Appendix E. Based on the 2022 PCI survey, the area-weighted average PCI for the entire pavement network at Boardman Airport is approximately 81, which corresponds to a PCI rating of Satisfactory.

To investigate the rate of deterioration of each pavement section, we compared the PCI results from the 2022 survey to the PCI results from the previous inspection. The variation in PCI between inspections for Boardman Airport pavement sections is outlined in Table 4B in this appendix.

Table 2B - BOARDMAN AIRPORT CURRENT BRANCH CONDITION REPORT

Branch ID	Number of Sections	Approximate Area, square feet	Use	Area Weighted Average Branch PCI	PCI Category
A01BO	1	87,477	APRON	100	Good
R04BO	1	420,000	RUNWAY	77	Satisfactory
T01BO	1	5,233	TAXIWAY	100	Good
T02BO	1	5,233	TAXIWAY	100	Good
TABO	4	80,984	TAXIWAY	74	Satisfactory
TC1BO	1	11,967	TAXIWAY	91	Good

Use Category	Number of Sections	Total Area, square feet	Area Weighted Average PCI
APRON	1	87,477	100
RUNWAY	1	420,000	77
TAXIWAY	7	103,417	78
ALL	**9**	**610,894**	**81**

Abbreviation: PCI = Pavement Condition Index

Table 3B - BOARDMAN AIRPORT 2022 PAVEMENT CONDITION INDEX SURVEY RESULTS

BranchID	SectionID	Last Construction Date	Surface Type	Use	Last Inspection Date	Age at Inspection	PCI	PCI Category	PCI % Climate	PCI % Load	PCI % Other
A01BO	01	7/15/2014	AC	APRON	7/1/2022	8	100	Good	100	0	0
R04BO	01	9/3/2004	AC	RUNWAY	7/1/2022	18	77	Satisfactory	100	0	0
T01BO	01	7/15/2014	AC	TAXIWAY	7/1/2022	8	100	Good	100	0	0
T02BO	01	7/15/2014	AC	TAXIWAY	7/1/2022	8	100	Good	100	0	0
TABO	01	9/2/2008	AC	TAXIWAY	7/1/2022	14	88	Good	100	0	0
TABO	02	8/1/2002	AC	TAXIWAY	7/1/2022	20	36	Very Poor	51	49	0
TABO	03	9/3/1980	AC	TAXIWAY	7/1/2022	42	71	Satisfactory	100	0	0
TABO	04	8/3/2004	AC	TAXIWAY	7/1/2022	18	71	Satisfactory	100	0	0
TC1BO	01	9/2/2008	AC	TAXIWAY	7/1/2022	14	91	Good	100	0	0

Abbreviations:
PCI = Pavement Condition Index, AC = Asphalt Concrete

Table 4B - BOARDMAN AIRPORT COMPARISON OF PREVIOUS INSPECTION AND 2022 RESULTS

Branch ID	Section ID	Surface Type[1]	Approximate Area, square feet	LCD[2]	2017 Survey			2022 Survey		Age[3]	Δ PCI/yr[4]	Rate of Deterioration
					PCI	PCI Category	Insp. Date	PCI	PCI Category			
A01BO	01	AC	87,477	7/15/2014	100	Good	6/10/2017	100	Good	3	0	NONE
R04BO	01	AC	420,000	9/3/2004	100	Satisfactory	6/10/2017	77	Satisfactory	13	-5	HIGH
T01BO	01	AC	5,233	7/15/2014	56	Good	6/10/2017	100	Good	3	9	NONE
T02BO	01	AC	5,233	7/15/2014	100	Good	6/10/2017	100	Good	3	0	NONE
TABO	01	AC	45,500	9/2/2008	100	Good	6/10/2017	88	Good	9	-2	NORMAL
TABO	02	AC	15,942	8/1/2002	53	Poor	6/10/2017	36	Very Poor	15	-3	NORMAL
TABO	03	AC	18,392	9/3/1980	100	Satisfactory	6/10/2017	71	Satisfactory	37	-6	HIGH
TABO	04	AC	1,150	8/3/2004	100	Good	6/10/2017	71	Satisfactory	13	-6	HIGH
TC1BO	01	AC	11,967	9/2/2008	100	Good	6/10/2017	91	Good	9	-2	NORMAL

Abbreviations:

[1] AC = Asphalt Concrete, PCI = Pavement Condition Index

[2] LCD = Last construction date. The date of the last major pavement rehabilitation (e.g. AC overlay)

[3] Age = Pavement age in years at the time of the PCI survey in 2017

[4] Δ PCI/yr = Change in PCI points per year between 2017 survey and 2022 survey

APPENDIX C

Future Pavement Condition Analysis

APPENDIX C

PAVEMENT CONDITION ANALYSIS

C.1 METHODOLOGY

In addition to assessing the current condition of a pavement, it is very important from a planning standpoint to be able to predict with reasonable accuracy its future condition. In a pavement management plan (PMP), this is done with the aid of a prediction model. When an APMS is initially implemented, the default models are typically used to predict the future condition of a pavement. However, after PCI surveys are completed, the historical data are then used to refine the models, so they better represent the deterioration of a particular class of pavement based on local climatic conditions, loading, material sources, construction procedures, etc. The importance of accurate prediction models is part of the reason it is essential to conduct periodic, routine surveys in order to track the rate of deterioration.

In PAVER, the pavement deterioration curves are developed based on the "family" model procedure. A pavement "family" is defined as a group of pavements with similar deterioration characteristics. The procedure for developing the prediction models is:

1) Define the pavement families.

2) Review the data.

3) Conduct a data outlier analysis.

4) Model the data.

C.2 PREDICTION MODELS

We developed separate condition prediction models for each pavement "family" at Boardman Airport. The delineation is based on branch use, surface type, section rank, and structural design life. We use five distinct models for the following "families" of pavements at Boardman Airport. For each model, we reviewed the data in order to filter out any inconsistent or inaccurate data or any data that fall outside boundary values set by PAVER. After outliers are removed and the data are checked for accuracy and reasonableness, the PAVER program calculates a best-fit curve using a fourth-order, polynomial-constrained, least-squares analysis procedure. This best-fit curve for each family is used in the analysis to predict the average behavior of all sections within each "family." Our condition prediction models for each "family" are provided on Figures 1C through 3C below.

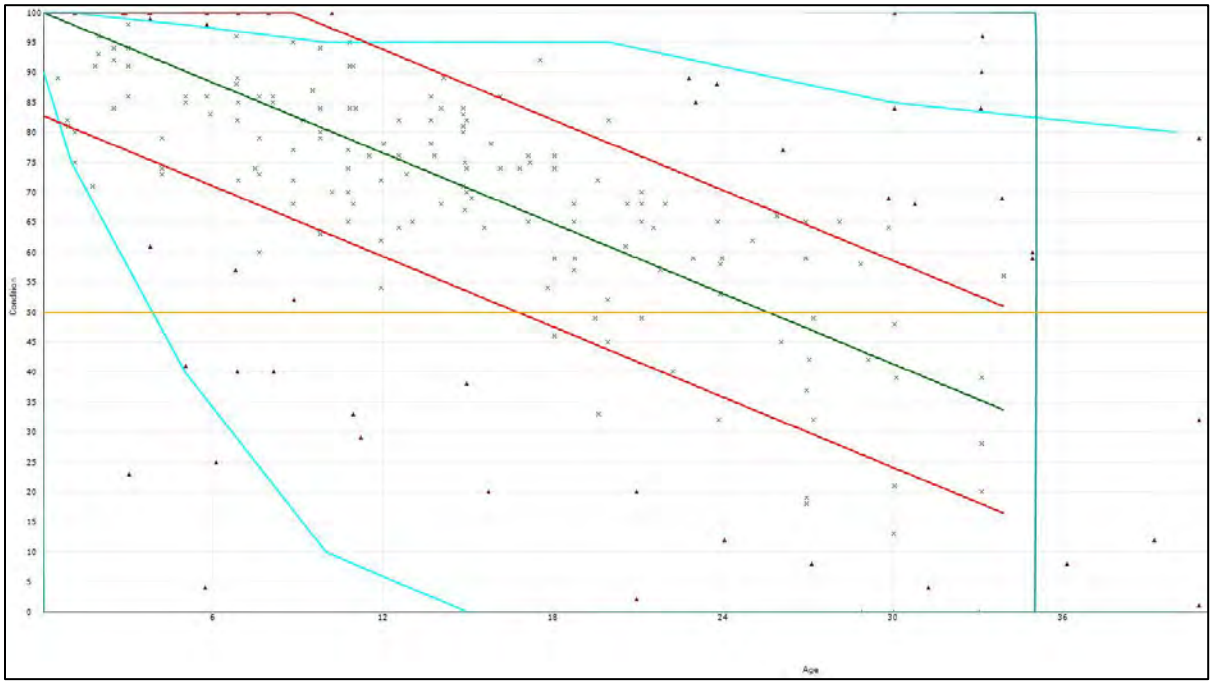


Figure 1C: CONDITION PREDICTION MODEL FOR EASTERN CATEGORY 4 AC AND AAC APRONS

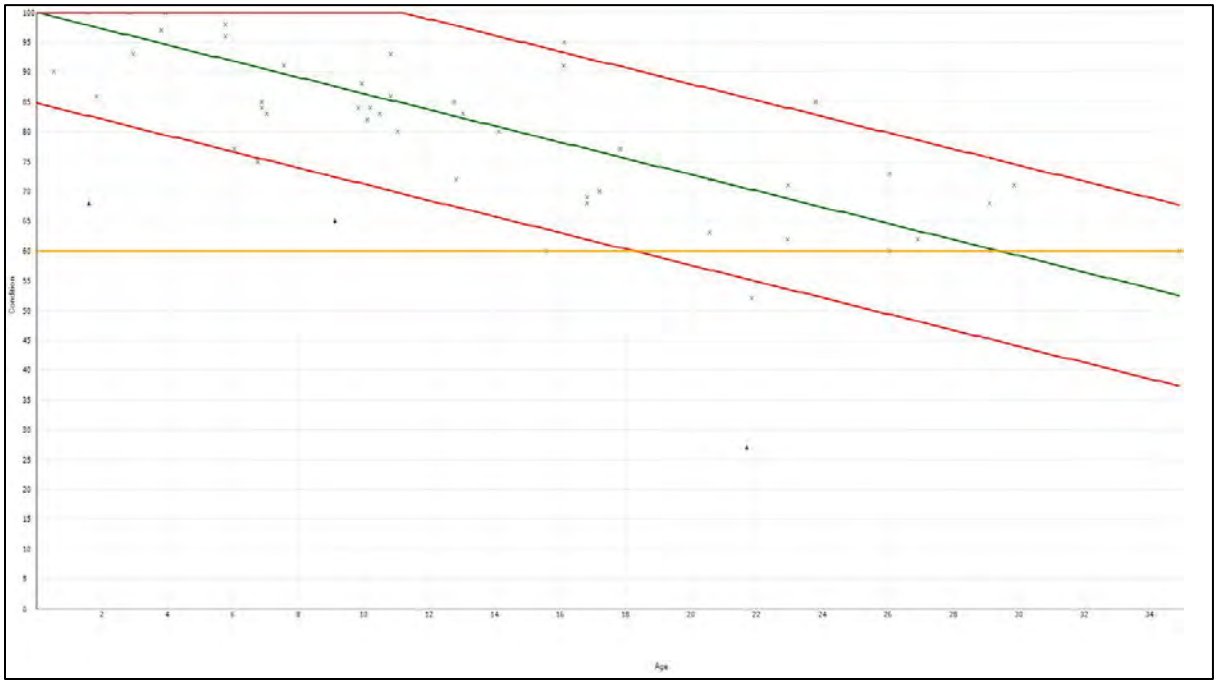


Figure 2C: CONDITION PREDICTION MODEL FOR EASTERN CATEGORY 4 AC AND AAC RUNWAYS

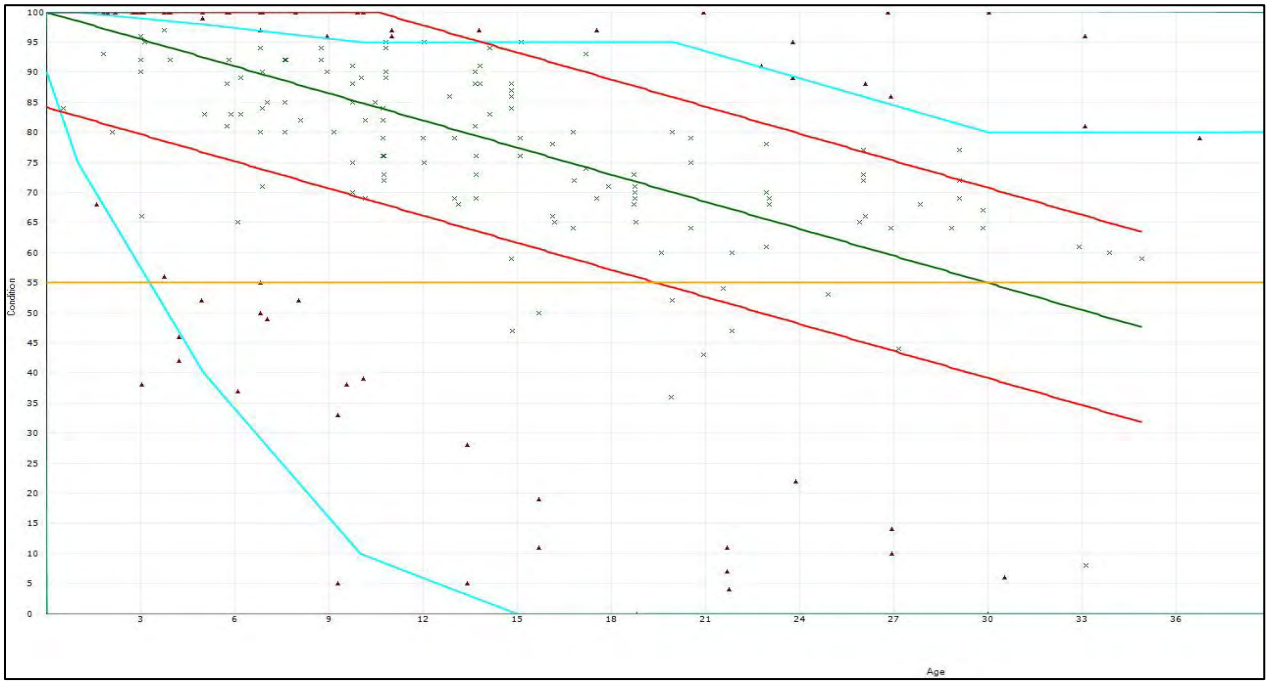


Figure 3C: CONDITION PREDICTION MODEL FOR EASTERN CATEGORY 4 AAC TAXIWAYS

C.3 CRITICAL PCI

Each of the condition-prediction models have an assigned critical PCI. The critical PCI is the point at which the pavement condition begins to deteriorate more quickly over time. As the condition deteriorates to a worse state, major M&R is triggered because the cost to apply localized M&R increases significantly. Pavement sections with PCI above the critical value are given a higher priority for funding during budget analysis in order to prevent them from deteriorating to the point where more costly rehabilitation is necessary. We used the following critical PCI values at Boardman Airport:

- Runways – 60
- Taxiways/Taxilanes – 55
- Aprons – 50

C.4 FUTURE CONDITION ANALYSIS

As previously discussed, the projected condition of each pavement section was determined for 5- and 10-year periods. The projected pavement conditions in 5 years and 10 years for each pavement section at Boardman Airport, along with the conditions at the previous inspection, are listed in Table 1C.

C.5 FUNCTIONAL REMAINING LIFE

As mentioned above, functional remaining life is the practical amount of time a pavement is in service before requiring rehabilitation, as estimated based solely on visual condition. This is not to be confused with structural remaining life, which requires analysis of the structural capacity of a pavement.

We calculated two forms of functional remaining life based on the current visual condition surveys of the pavement at Boardman Airport, the time until rehabilitation, and the time until the pavement is no longer operational due to high foreign object debris potential and increased safety concerns for trafficking aircraft (PCI less than 40). The results of the functional life analysis are provided in Table 2C.

Table 1C - PAST, PRESENT AND FUTURE PCI

BranchID	SectionID	Past Inspection PCI 2017	Current PCI 2022	Predicted Future PCI 2027	Predicted Future PCI 2032
A01BO	01	100	100	90	80
R04BO	01	100	77	70	63
T01BO	01	56	100	93	85
T02BO	01	100	100	93	85
TABO	01	100	88	81	73
TABO	02	53	36	29	21
TABO	03	100	71	64	56
TABO	04	100	71	64	56
TC1BO	01	100	91	84	76

Abbreviation: PCI = Pavement Condition Index

Table 2C - BOARDMAN AIRPORT FUNCTIONAL REMAINING LIFE ANALYSIS

Branch ID	Section ID	Surface Type	Current PCI	Years to Major M&R	Major M&R Trigger PCI[1]	Years to End of Functional Service
A01BO	01	AC	100	> 20	50	> 20
R04BO	01	AC	77	6 - 10	60	> 20
T01BO	01	AC	100	> 20	55	> 20
T02BO	01	AC	100	> 20	55	> 20
TABO	01	AC	88	> 20	55	> 20
TABO	02	AC	36	0 - 5	55	0 - 5
TABO	03	AC	71	6 - 10	55	> 20
TABO	04	AC	71	6 - 10	55	> 20
TC1BO	01	AC	91	> 20	55	> 20

Abbreviations:
PCI = Pavement Condition Index, AC = Asphalt Concrete
[1] Major M&R (Maintenance and Rehabilitation) Trigger PCI = Critical PCI

APPENDIX D

Unit Cost Data and Maintenance and Rehabilitation Plan

APPENDIX D

UNIT COST DATA AND MAINTENANCE AND REHABILITATION PLAN

D.1 ANALYSIS METHODOLOGY

We evaluated the M&R needs, as determined from the PAVER analysis results, in order to develop project recommendations for the next five years. The purpose of this analysis is to determine the M&R needs of the Boardman Airport pavement network condition over time. We used PAVER v7.0.8 software to develop network-level project recommendations for the next five years.

The PAVER M&R Work Planning Module identifies when and where M&R is required and how much it will cost. M&R plans can be developed either by assuming an annual budget or by identifying specific constraints, such as a condition goal, to determine the budget required to meet the goal. The M&R work planning analysis was based on a five-year period beginning on August 1, 2024. A backlog elimination analysis scenario was selected to generate a list of global maintenance and rehabilitation projects in order to optimize the allocation of capital and establish preservation-based project recommendations. The repair strategies considered for pavement sections in our analysis are as follows:

- Reconstruction – Considered for pavements with a PCI less than 40.
- Flexible Overlay – Considered for pavements between 40 PCI and the critical PCI, and for pavements exhibiting significant load-related distresses.
- Global Maintenance – Treatments (fog seal, slurry seal, thin AC overlay) applied to an entire pavement section with the intent of slowing the rate of deterioration.
- Localized Maintenance – Maintenance performed on a routine basis, such as crack sealing, wide crack repair, and patching.

It should be noted that the five-year list of recommended projects only includes the highest-cost maintenance items and does not include routine localized maintenance (e.g., crack sealing) work that should also be conducted in addition to and concurrently with the five-year work plan.

D.1.1 Pavement Rank and Use Prioritization

Pavement sections are assigned a rank to establish their relative importance in the overall pavement network, which is most commonly defined by their use (e.g., Taxiway, Apron, Runway). The PAVER analysis uses the combination of the section rank and the branch use

to define the priority of each section during the M&R analysis. Table 1D displays the branch use and section rank prioritization schema we used for analysis.

Table 1D: M&R WORK PRIORITY BY BRANCH USE AND SECTION RANK

Branch Use	Section Rank		
	Primary	Secondary	Tertiary
RUNWAY	1	3	6
TAXIWAY	2	5	8
APRON	4	7	9

D.2 MAINTENANCE POLICIES AND UNIT COSTS

The distress-maintenance policies are policies that determine what type of work should be applied to a specific distress type and severity. For example, on an AC pavement, a medium-severity longitudinal/transverse crack would be repaired by crack sealing. Policies for all the distress types and severities are established by ASTM D5340.

Although our work scope does not include budget analysis, we did assign construction costs to the maintenance work so that PAVER would allocate M&R projects that were approximately equal in cost for each year of the five-year period. The anticipated cost of performing M&R is based on cost tables that relate M&R work type cost to PCI. We reviewed the unit costs from the 2017 report and updated them by reviewing the bid tabulations for recent projects within the vicinity of Boardman Airport and information provided by the project team. The costs for reconstruction are based on the existing pavement sections present within each branch use at Boardman Airport. The costs represent the fully-loaded costs and include aspects of the project such as administration, contingencies, mobilization, and striping. The cost tables used in the analysis are presented in Table 2D below.

Table 2D: BOARDMAN AIRPORT UNIT COST DATA

Type of M&R	Work Type	Unit Cost	Work Unit
Major M&R	Complete Reconstruction with AC	$13.32	Sq Ft
	Cold Mill and Overlay – 2 Inches Thick	$5.88	Sq Ft
Global M&R	Surface Treatment - Slurry Seal	$0.40	Sq Ft
	Surface Treatment - Fog Seal	$0.24	Sq Ft
Localized Preventive M&R	Crack Sealing - AC	$2.40	Ft
	Crack Sealing - PCC	$18.00	Ft
	Crack Sealing – Wide Cracks	$39.60	Ft
	AC Patching – Full Depth	$60.00	Sq Ft
	PCC Patching – Full Depth	$120.00	Sq Ft

D.3 RECOMMENDED LOCALIZED MAINTENANCE

In order to properly maintain aging pavements, localized M&R activities such as crack sealing and patching should be performed on a routine basis. A list of recommended localized maintenance activities is provided in Table 3D of this appendix.

D.4 RECOMMENDED GLOBAL MAINTENANCE AND REHABILITATION PROJECTS

Global maintenance and rehabilitation projects refer to activities such as slurry seal and thin AC overlays, as well as thick AC overlays and reconstruction. A list of recommended global M&R activities is provided in Table 4D of this appendix.

Table 3D - BOARDMAN AIRPORT NETWORK MAINTENANCE REPORT

Network	Branch ID	Section ID	Distress	Severity	Action	Work Quantity	Unit	Unit Cost	Work Cost	Section Total
Boardman	R04BO	01	Long. & Trans. Cracking	Low	Crack Sealing - AC	28,952	Ft	$2.40	$69,485	$69,485
Boardman	TABO	01	Long. & Trans. Cracking	Low	Crack Sealing - AC	638	Ft	$2.40	$1,531	$1,531
Boardman	TABO	02	Long. & Trans. Cracking	Medium	Crack Sealing - AC	1,738	Ft	$2.40	$4,171	
Boardman	TABO	02	Alligator Cracking	Medium	Patching - AC Deep	587	SqFt	$60.00	$35,183	$41,396
Boardman	TABO	02	Alligator Cracking	High	Patching - AC Deep	34	SqFt	$60.00	$2,041	
Boardman	TABO	03	Long. & Trans. Cracking	High	Crack Seal - Wide Cracks	200	Ft	$39.60	$7,938	
Boardman	TABO	03	Long. & Trans. Cracking	Medium	Crack Sealing - AC	182	Ft	$2.40	$437	$8,906
Boardman	TABO	03	Long. & Trans. Cracking	Low	Crack Sealing - AC	221	Ft	$2.40	$531	
Boardman	TABO	04	Long. & Trans. Cracking	Medium	Crack Sealing - AC	50	Ft	$2.40	$120	$120
Boardman	TC1BO	01	Long. & Trans. Cracking	Low	Crack Sealing - AC	100	Ft	$2.40	$240	$240

Table 4D - FIVE-YEAR GLOBAL MAINTENANCE AND REHABILITATION PLAN

Action Year	Branch ID	Section ID	Branch Use	Surface Type	Current PCI	Action	Area, square feet	Unit Cost per square foot	Total Cost
2024	R04BO	01	RUNWAY	AC	77	Slurry Seal	420,000	$0.40	$168,001
2025	TABO	02	TAXIWAY	AC	36	Reconstruction	15,942	$13.32	$212,354
2027	TABO	01	TAXIWAY	AC	88	Slurry Seal	45,500	$0.40	$18,200
	TABO	03	TAXIWAY	AC	71	Slurry Seal	18,392	$0.40	$7,357
	TABO	04	TAXIWAY	AC	71	Slurry Seal	1,150	$0.40	$460
	TC1BO	01	TAXIWAY	AC	91	Slurry Seal	11,967	$0.40	$4,787
2028	A01BO	01	APRON	AC	100	Fog Seal	87,477	$0.24	$20,994

Abbreviations:
PCI = Pavement Condition Index, AC = Asphalt Concrete

Cost Summary	
2024 Total Project Cost	$168,001
2025 Total Project Cost	$212,354
2026 Total Project Cost	$0
2027 Total Project Cost	$30,804
2028 Total Project Cost	$20,994
Total 5-Year Project Cost	**$432,154**

APPENDIX E

Reinspection Report

Re-Inspection Report

ODA_WOC3_4-10-2023_PostWHEdits_4PM
Generated Date 4/13/2023

Network: Boardman **Name:** Boardman

Branch: A01BO **Name:** Apron 01 Boardman **Use:** APRON **Area:** 87,477 SqFt

Section: 01 of 1 **From:** T02BO **To:** T03BO **Last Const.:** 7/15/2014

Surface: AC **Family:** 2022_Eastern_Cat4_Apron_AC/AAC **Zone:** M50 **Category:** N **Rank:** P

Area: 87,477 SqFt **Length:** 213 Ft **Width:** 410 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Work Date: 7/13/2014 **Work Type:** Subbase - Aggregate **Code:** SB-AG **Is Major M&R:** False

Work Date: 7/14/2014 **Work Type:** Base Course - Aggregate **Code:** BA-AG **Is Major M&R:** False

Work Date: 7/15/2014 **Work Type:** New Construction - AC **Code:** NC-AC **Is Major M&R:** True

Last Insp. Date: 7/1/2022 **TotalSamples:** 16 **Surveyed:** 5

Conditions: **PCI:** 100

Inspection Comments:

Sample Number: 04 **Type:** R **Area:** 6934.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Sample Number: 06 **Type:** R **Area:** 5000.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Sample Number: 07 **Type:** R **Area:** 5000.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Sample Number: 10 **Type:** R **Area:** 5000.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Sample Number: 13 **Type:** R **Area:** 5056.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Network: Boardman **Name:** Boardman

Branch: R04BO **Name:** Runway 4/22 Boardman **Use:** RUNWAY **Area:** 420,000 SqFt

Section: 01 of 1 **From:** Runway 04 End **To:** Runway 22 End **Last Const.:** 9/3/2004

Surface: AC **Family:** 2022_Eastern_Cat4_RW_AC/AAC **Zone:** M50 **Category:** N **Rank:** P

Area: 420,000 SqFt **Length:** 4,200 Ft **Width:** 100 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Work Date: 8/1/2004	**Work Type:** Subbase - Aggregate	**Code:** SB-AG	**Is Major M&R:** False
Work Date: 9/2/2004	**Work Type:** Base Course - Aggregate	**Code:** BA-AG	**Is Major M&R:** False
Work Date: 9/3/2004	**Work Type:** New Construction - AC	**Code:** NC-AC	**Is Major M&R:** True
Work Date: 9/1/2012	**Work Type:** Crack Sealing - AC	**Code:** CS-AC	**Is Major M&R:** False
Work Date: 11/1/2015	**Work Type:** Crack Sealing - AC	**Code:** CS-AC	**Is Major M&R:** False

Last Insp. Date: 7/1/2022 **TotalSamples:** 84 **Surveyed:** 6

Conditions: **PCI:** 77

Inspection Comments:

Sample Number: 09 **Type:** R **Area:** 5000.00 SqFt **PCI:** 75

Sample Comments:

48	L & T CR	L	16.00	Ft
48	L & T CR	L	250.00	Ft
48	L & T CR	L	112.00	Ft
57	WEATHERING	L	5000.00	SqFt

Sample Number: 24 **Type:** R **Area:** 5000.00 SqFt **PCI:** 77

Sample Comments:

48	L & T CR	L	68.00	Ft
48	L & T CR	L	250.00	Ft
48	L & T CR	L	16.00	Ft
57	WEATHERING	L	5000.00	SqFt

Sample Number: 39 **Type:** R **Area:** 5000.00 SqFt **PCI:** 74

Sample Comments:

48	L & T CR	L	250.00	Ft
48	L & T CR	L	80.00	Ft
48	L & T CR	L	36.00	Ft
48	L & T CR	L	36.00	Ft
48	L & T CR	L	16.00	Ft
57	WEATHERING	L	5000.00	SqFt

Sample Number: 54 **Type:** R **Area:** 5000.00 SqFt **PCI:** 77

Sample Comments:

48	L & T CR	L	250.00	Ft
48	L & T CR	L	32.00	Ft
48	L & T CR	L	32.00	Ft
48	L & T CR	L	8.00	Ft
57	WEATHERING	L	5000.00	SqFt

Sample Number: 69 **Type:** R **Area:** 5000.00 SqFt **PCI:** 78

Sample Comments:

48	L & T CR	L	58.00	Ft
48	L & T CR	L	6.00	Ft
48	L & T CR	L	250.00	Ft
57	WEATHERING	L	5000.00	SqFt

Sample Number: 84 **Type:** R **Area:** 5000.00 SqFt **PCI:** 78

Sample Comments:

48	L & T CR	L	32.00	Ft

48	L & T CR	L	20.00	Ft
48	L & T CR	L	250.00	Ft
57	WEATHERING	L	5000.00	SqFt

Network: Boardman **Name:** Boardman

Branch: T01BO **Name:** Taxiway 01 Boardman **Use:** TAXIWAY **Area:** 5,233 SqFt

Section: 01 of 1 **From:** Taxiway A **To:** Apron **Last Const.:** 7/15/2014

Surface: AC **Family:** 2022_Eastern_Cat4_Taxiway_AC/AAC **Zone:** M50 **Category:** N **Rank:** P

Area: 5,233 SqFt **Length:** 70 Ft **Width:** 50 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Work Date: 7/13/2014 **Work Type:** Subbase - Aggregate **Code:** SB-AG **Is Major M&R:** False

Work Date: 7/14/2014 **Work Type:** Base Course - Aggregate **Code:** BA-AG **Is Major M&R:** False

Work Date: 7/15/2014 **Work Type:** New Construction - AC **Code:** NC-AC **Is Major M&R:** True

Last Insp. Date: 7/1/2022 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 100

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 4965.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Network: Boardman **Name:** Boardman

Branch: T02BO **Name:** Taxiway 02 Boardman **Use:** TAXIWAY **Area:** 5,233 SqFt

Section: 01 of 1 **From:** Taxiway A **To:** Apron **Last Const.:** 7/15/2014

Surface: AC **Family:** 2022_Eastern_Cat4_Taxiway_AC/AAC **Zone:** M50 **Category:** N **Rank:** P

Area: 5,233 SqFt **Length:** 70 Ft **Width:** 50 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Work Date: 7/13/2014	**Work Type:** Subbase - Aggregate	**Code:** SB-AG	**Is Major M&R:** False
Work Date: 7/14/2014	**Work Type:** Base Course - Aggregate	**Code:** BA-AG	**Is Major M&R:** False
Work Date: 7/15/2014	**Work Type:** New Construction - AC	**Code:** NC-AC	**Is Major M&R:** True

Last Insp. Date: 7/1/2022 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 100

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 5233.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Network: Boardman **Name:** Boardman

Branch: TABO **Name:** Taxiway A Boardman **Use:** TAXIWAY **Area:** 80,984 SqFt

Section: 03 of 4 **From:** TA-02 **To:** TA-04 **Last Const.:** 9/3/1980

Surface: AC **Family:** 2022_Eastern_Cat4_Taxiway_AC/AAC **Zone:** M50 **Category:** N **Rank:** P

Area: 18,392 SqFt **Length:** 260 Ft **Width:** 46 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Work Date: 9/1/1980	**Work Type:** Subbase - Aggregate	**Code:** SB-AG	**Is Major M&R:** True
Work Date: 9/2/1980	**Work Type:** Base Course - Aggregate	**Code:** BA-AG	**Is Major M&R:** True
Work Date: 9/3/1980	**Work Type:** New Construction - AC	**Code:** NC-AC	**Is Major M&R:** True
Work Date: 9/1/1996	**Work Type:** Crack Sealing - AC	**Code:** CS-AC	**Is Major M&R:** False
Work Date: 6/1/2001	**Work Type:** Crack Sealing - AC	**Code:** CS-AC	**Is Major M&R:** False
Work Date: 6/2/2001	**Work Type:** Surface Treatment - Slurry Seal	**Code:** ST-SS	**Is Major M&R:** False
Work Date: 9/1/2012	**Work Type:** Crack Sealing - AC	**Code:** CS-AC	**Is Major M&R:** False
Work Date: 11/1/2015	**Work Type:** Crack Sealing - AC	**Code:** CS-AC	**Is Major M&R:** False

Last Insp. Date: 7/1/2022 **TotalSamples:** 4 **Surveyed:** 3

Conditions: **PCI:** 71

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 5000.00 SqFt **PCI:** 84

Sample Comments:

48	L & T CR	L	47.00	Ft
48	L & T CR	L	18.00	Ft
50	PATCHING	L	100.00	SqFt
57	WEATHERING	L	5000.00	SqFt

Sample Number: 02 **Type:** R **Area:** 5000.00 SqFt **PCI:** 74

Sample Comments:

48	L & T CR	L	95.00	Ft
50	PATCHING	L	116.00	SqFt
50	PATCHING	M	83.00	SqFt
57	WEATHERING	L	5000.00	SqFt

Sample Number: 04 **Type:** R **Area:** 5047.00 SqFt **PCI:** 56

Sample Comments:

48	L & T CR	L	21.00	Ft
48	L & T CR	M	149.00	Ft
48	L & T CR	H	46.00	Ft
48	L & T CR	H	46.00	Ft
48	L & T CR	H	72.00	Ft
57	WEATHERING	L	5047.00	SqFt

Network: Boardman **Name:** Boardman

Branch: TABO **Name:** Taxiway A Boardman **Use:** TAXIWAY **Area:** 80,984 SqFt

Section: 02 of 4 **From:** TA-01 **To:** TA-03 **Last Const.:** 8/1/2002

Surface: AC **Family:** 2022_Eastern_Cat4_Taxiway_AC/AAC **Zone:** M50 **Category:** N **Rank:** P

Area: 15,942 SqFt **Length:** 200 Ft **Width:** 83 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Work Date: 8/1/2002	**Work Type:** New Construction - Initial	**Code:** NU-IN	**Is Major M&R:** True
Work Date: 9/1/2012	**Work Type:** Crack Sealing - AC	**Code:** CS-AC	**Is Major M&R:** False
Work Date: 9/2/2012	**Work Type:** Patching - AC Deep	**Code:** PA-AD	**Is Major M&R:** False
Work Date: 11/1/2015	**Work Type:** Crack Sealing - AC	**Code:** CS-AC	**Is Major M&R:** False

Last Insp. Date: 7/1/2022 **TotalSamples:** 3 **Surveyed:** 2

Conditions: **PCI:** 36

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 6559.00 SqFt **PCI:** 36

Sample Comments:

41	ALLIGATOR CR	M	66.00	SqFt
41	ALLIGATOR CR	M	55.00	SqFt
41	ALLIGATOR CR	H	10.00	SqFt
48	L & T CR	M	405.00	Ft
48	L & T CR	M	350.00	Ft
50	PATCHING	L	20.00	SqFt
57	WEATHERING	M	6559.00	SqFt

Sample Number: 02 **Type:** R **Area:** 4338.00 SqFt **PCI:** 35

Sample Comments:

41	ALLIGATOR CR	M	90.00	SqFt
41	ALLIGATOR CR	M	66.00	SqFt
41	ALLIGATOR CR	M	20.00	SqFt
41	ALLIGATOR CR	M	40.00	SqFt
48	L & T CR	M	130.00	Ft
48	L & T CR	M	303.00	Ft
57	WEATHERING	M	4338.00	SqFt

Network: Boardman **Name:** Boardman

Branch: TABO **Name:** Taxiway A Boardman **Use:** TAXIWAY **Area:** 80,984 SqFt

Section: 04 of 4 **From:** TA-03 **To:** R22 End **Last Const.:** 8/3/2004

Surface: AC **Family:** 2022_Eastern_Cat4_Taxiway_AC/AAC **Zone:** M50 **Category:** N **Rank:** P

Area: 1,150 SqFt **Length:** 25 Ft **Width:** 46 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Work Date: 8/1/2004 **Work Type:** Subbase - Aggregate **Code:** SB-AG **Is Major M&R:** False

Work Date: 8/2/2004 **Work Type:** Base Course - Aggregate **Code:** BA-AG **Is Major M&R:** False

Work Date: 8/3/2004 **Work Type:** New Construction - AC **Code:** NC-AC **Is Major M&R:** True

Last Insp. Date: 7/1/2022 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 71

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 1150.00 SqFt **PCI:** 71

Sample Comments:

48	L & T CR	M	50.00	Ft
57	WEATHERING	L	1150.00	SqFt

Network: Boardman **Name:** Boardman

Branch: TABO **Name:** Taxiway A Boardman **Use:** TAXIWAY **Area:** 80,984 SqFt

Section: 01 of 4 **From:** Taxiway C1 **To:** TA-02 **Last Const.:** 9/2/2008

Surface: AC **Family:** 2022_Eastern_Cat4_Taxiway_AC/AAC **Zone:** M50 **Category:** N **Rank:** P

Area: 45,500 SqFt **Length:** 1,300 Ft **Width:** 35 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Work Date: 9/1/2008 **Work Type:** Base Course - Aggregate **Code:** BA-AG **Is Major M&R:** False

Work Date: 9/2/2008 **Work Type:** New Construction - AC **Code:** NC-AC **Is Major M&R:** True

Last Insp. Date: 7/1/2022 **TotalSamples:** 9 **Surveyed:** 4

Conditions: **PCI:** 88

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3508.00 SqFt **PCI:** 89

Sample Comments:

48	L & T CR	L	30.00	Ft
57	WEATHERING	L	3508.00	SqFt

Sample Number: 04 **Type:** R **Area:** 5250.00 SqFt **PCI:** 90

Sample Comments:

48	L & T CR	L	10.00	Ft
48	L & T CR	L	10.00	Ft
57	WEATHERING	L	5250.00	SqFt

Sample Number: 06 **Type:** R **Area:** 5250.00 SqFt **PCI:** 89

Sample Comments:

48	L & T CR	L	60.00	Ft
48	L & T CR	L	10.00	Ft
57	WEATHERING	L	5250.00	SqFt

Sample Number: 08 **Type:** R **Area:** 5250.00 SqFt **PCI:** 85

Sample Comments:

48	L & T CR	L	50.00	Ft
48	L & T CR	L	100.00	Ft
57	WEATHERING	L	5000.00	SqFt

Network: Boardman **Name:** Boardman

Branch: TC1BO **Name:** Taxiway C1 Boardman **Use:** TAXIWAY **Area:** 11,967 SqFt

Section: 01 of 1 **From:** Runway 4/22 **To:** Taxiway A **Last Const.:** 9/2/2008

Surface: AC **Family:** 2022_Eastern_Cat4_Taxiway_AC/AAC **Zone:** M50 **Category:** N **Rank:** P

Area: 11,967 SqFt **Length:** 233 Ft **Width:** 35 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Work Date: 9/1/2008	**Work Type:** Base Course - Aggregate	**Code:** BA-AG	**Is Major M&R:** False
Work Date: 9/2/2008	**Work Type:** New Construction - AC	**Code:** NC-AC	**Is Major M&R:** True
Work Date: 9/1/2012	**Work Type:** Crack Sealing - AC	**Code:** CS-AC	**Is Major M&R:** False
Work Date: 11/1/2015	**Work Type:** Crack Sealing - AC	**Code:** CS-AC	**Is Major M&R:** False

Last Insp. Date: 7/1/2022 **TotalSamples:** 2 **Surveyed:** 2

Conditions: **PCI:** 91

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 5622.00 SqFt **PCI:** 88

Sample Comments:

48	L & T CR	L	100.00	Ft
57	WEATHERING	L	5622.00	SqFt

Sample Number: 02 **Type:** R **Area:** 6345.00 SqFt **PCI:** 94

Sample Comments:

57	WEATHERING	L	6345.00	SqFt

APPENDIX F

Work History Report

Pavement Database: ODA_WOC3_4-10-2023_PostWHEdits_4PM

Network: Boardman **Branch:** A01BO Apron 01 Boardma **Section:** 01 **Surface:**AC

L.C.D. 7/15/2014 **Use:** APRON **Rank:** P **Length:** 213.00 (Ft) **Width:** 410.00 (Ft) **True Area:** 87477 (SqFt

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/15/2014	NC-AC	New Construction - AC	0.00	3.00	☑	P401
7/14/2014	BA-AG	Base Course - Aggregate	0.00	5.00	☐	P209
7/13/2014	SB-AG	Subbase - Aggregate	0.00	8.00	☐	P154

Network: Boardman **Branch:** R04BO Runway 4/22 Boar **Section:** 01 **Surface:**AC

L.C.D. 9/3/2004 **Use:** RUNWAY **Rank:** P **Length:** 4,200.00 (Ft) **Width:** 100.00 (Ft) **True Area:** 420000.0001 (SqFt

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
11/1/2015	CS-AC	Crack Sealing - AC	0.00	0.00	☐	PMP 2015
9/1/2012	CS-AC	Crack Sealing - AC	0.00	0.00	☐	PMP 2012
9/3/2004	NC-AC	New Construction - AC	0.00	2.00	☑	
9/2/2004	BA-AG	Base Course - Aggregate	0.00	6.00	☐	
8/1/2004	SB-AG	Subbase - Aggregate	0.00	6.00	☐	

Network: Boardman **Branch:** T01BO Taxiway 01 Board **Section:** 01 **Surface:**AC

L.C.D. 7/15/2014 **Use:** TAXIWAY **Rank:** P **Length:** 70.00 (Ft) **Width:** 50.00 (Ft) **True Area:** 5233 (SqFt

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/15/2014	NC-AC	New Construction - AC	0.00	3.00	☑	P401
7/14/2014	BA-AG	Base Course - Aggregate	0.00	5.00	☐	P209
7/13/2014	SB-AG	Subbase - Aggregate	0.00	8.00	☐	P154

Network: Boardman **Branch:** T02BO Taxiway 02 Board **Section:** 01 **Surface:**AC

L.C.D. 7/15/2014 **Use:** TAXIWAY **Rank:** P **Length:** 70.00 (Ft) **Width:** 50.00 (Ft) **True Area:** 5233.000001 (SqFt

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/15/2014	NC-AC	New Construction - AC	0.00	3.00	☑	P401
7/14/2014	BA-AG	Base Course - Aggregate	0.00	5.00	☐	P209
7/13/2014	SB-AG	Subbase - Aggregate	0.00	8.00	☐	P154

Network: Boardman **Branch:** TABO Taxiway A Board **Section:** 01 **Surface:**AC

L.C.D. 9/2/2008 **Use:** TAXIWAY **Rank:** P **Length:** 1,300.00 (Ft) **Width:** 35.00 (Ft) **True Area:** 45500.00001 (SqFt

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
9/2/2008	NC-AC	New Construction - AC	0.00	2.00	☑	
9/1/2008	BA-AG	Base Course - Aggregate	0.00	12.00	☐	

Network: Boardman **Branch:** TABO Taxiway A Board **Section:** 02 **Surface:**AC

L.C.D. 8/1/2002 **Use:** TAXIWAY **Rank:** P **Length:** 200.00 (Ft) **Width:** 83.00 (Ft) **True Area:** 15942 (SqFt

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
11/1/2015	CS-AC	Crack Sealing - AC	0.00	0.00	☐	PMP 2015
9/2/2012	PA-AD	Patching - AC Deep	0.00	0.00	☐	PMP 2012
9/1/2012	CS-AC	Crack Sealing - AC	0.00	0.00	☐	PMP 2012
8/1/2002	NU-IN	New Construction - Initial	0.00	0.00	☑	

Network: Boardman **Branch:** TABO Taxiway A Board **Section:** 03 **Surface:**AC

L.C.D. 9/3/1980 **Use:** TAXIWAY **Rank:** P **Length:** 260.00 (Ft) **Width:** 46.00 (Ft) **True Area:** 18392 (SqFt

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
11/1/2015	CS-AC	Crack Sealing - AC	0.00	0.00	☐	PMP 2015
9/1/2012	CS-AC	Crack Sealing - AC	0.00	0.00	☐	PMP 2012
6/2/2001	ST-SS	Surface Treatment - Slurry Seal	0.00	0.50	☐	Oregon DOA 2001 Maint. Program
6/1/2001	CS-AC	Crack Sealing - AC	0.00	0.10	☐	Oregon DOA 2001 Maint. Program
9/1/1996	CS-AC	Crack Sealing - AC	0.00	0.10	☐	
9/3/1980	NC-AC	New Construction - AC	0.00	1.50	☑	
9/2/1980	BA-AG	Base Course - Aggregate	0.00	2.00	☑	
9/1/1980	SB-AG	Subbase - Aggregate	0.00	10.00	☑	BETWEEN 8" - 12"

Network: Boardman **Branch:** TABO Taxiway A Board **Section:** 04 **Surface:**AC

L.C.D. 8/3/2004 **Use:** TAXIWAY **Rank:** P **Length:** 25.00 (Ft) **Width:** 46.00 (Ft) **True Area:** 1150.000000 (SqFt

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
8/3/2004	NC-AC	New Construction - AC	0.00	2.00	☑	
8/2/2004	BA-AG	Base Course - Aggregate	0.00	6.00	☐	
8/1/2004	SB-AG	Subbase - Aggregate	0.00	6.00	☐	

Network: Boardman **Branch:** TC1BO Taxiway C1 Board **Section:** 01 **Surface:**AC

L.C.D. 9/2/2008 **Use:** TAXIWAY **Rank:** P **Length:** 233.00 (Ft) **Width:** 35.00 (Ft) **True Area:** 11967.00000 (SqFt

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
11/1/2015	CS-AC	Crack Sealing - AC	0.00	0.00	☐	PMP 2015
9/1/2012	CS-AC	Crack Sealing - AC	0.00	0.00	☐	PMP 2012
9/2/2008	NC-AC	New Construction - AC	0.00	2.00	☑	
9/1/2008	BA-AG	Base Course - Aggregate	0.00	12.00	☐	

Summary:

Work Description	Section Count	Area Total (SqFt)	Thickness Avg (in)	Thickness STD (in)
Base Course - Aggregate	8	594,952.00	6.62	3.31
Crack Sealing - AC	10	969,386.00	0.02	0.04
New Construction - AC	8	594,952.00	2.31	0.56
New Construction - Initial	1	15,942.00	0.00	0.00
Patching - AC Deep	1	15,942.00	0.00	0.00
Subbase - Aggregate	6	537,485.00	7.67	1.37
Surface Treatment - Slurry Seal	1	18,392.00	0.50	0.00