

# Waukon Municipal Airport

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IOWA | DOT

## Pavement Management Report

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# WAUKON MUNICIPAL AIRPORT PAVEMENT MANAGEMENT REPORT

## Prepared For:



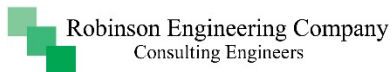
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## TABLE OF CONTENTS

|                                                                |    |
|----------------------------------------------------------------|----|
| INTRODUCTION.....                                              | 1  |
| PAVEMENT INVENTORY.....                                        | 3  |
| PAVEMENT EVALUATION.....                                       | 6  |
| Pavement Evaluation Procedure .....                            | 6  |
| Pavement Evaluation Results.....                               | 8  |
| Inspection Comments.....                                       | 12 |
| Runway .....                                                   | 12 |
| Taxiway.....                                                   | 12 |
| Apron .....                                                    | 12 |
| PAVEMENT MAINTENANCE AND REHABILITATION PROGRAM.....           | 13 |
| Analysis Parameters.....                                       | 13 |
| Critical PCIs .....                                            | 13 |
| Localized Preventive Maintenance Policies and Unit Costs ..... | 13 |
| Major Rehabilitation Unit Costs .....                          | 13 |
| Budget and Inflation Rate.....                                 | 13 |
| Analysis Approach.....                                         | 13 |
| Analysis Results .....                                         | 14 |
| General Maintenance Recommendations.....                       | 14 |
| SUMMARY .....                                                  | 16 |
| REFERENCES.....                                                | 17 |

## LIST OF FIGURES

|                                                                                 |    |
|---------------------------------------------------------------------------------|----|
| Figure 1. Pavement condition versus cost of repair. ....                        | 1  |
| Figure 2. Pavement area by branch use at Waukon Municipal Airport.....          | 4  |
| Figure 3. Waukon Municipal Airport network definition map.....                  | 5  |
| Figure 4. Visual representation of PCI scale on typical pavement surfaces. .... | 6  |
| Figure 5. PCI versus repair type.....                                           | 7  |
| Figure 6. Pavement area by PCI range at Waukon Municipal Airport. ....          | 8  |
| Figure 7. Area-weighted PCI by branch use at Waukon Municipal Airport.....      | 9  |
| Figure 8. Waukon Municipal Airport PCI map. ....                                | 10 |

## LIST OF TABLES

|                                                                                |    |
|--------------------------------------------------------------------------------|----|
| Table 1. 2025 pavement evaluation results.....                                 | 11 |
| Table 2. 5-year M&R program under an unlimited funding analysis scenario. .... | 14 |

**APPENDIXES**

Appendix A. Cause of Distress Tables .....A-1

Appendix B. Inspection Photographs .....B-1

Appendix C. Inspection Report..... C-1

Appendix D. Work History Report ..... D-1

Appendix E. Localized Preventive Maintenance Policies and Unit Cost Tables.....E-1

Appendix F. Year 2025 Localized Preventive Maintenance Details ..... F-1

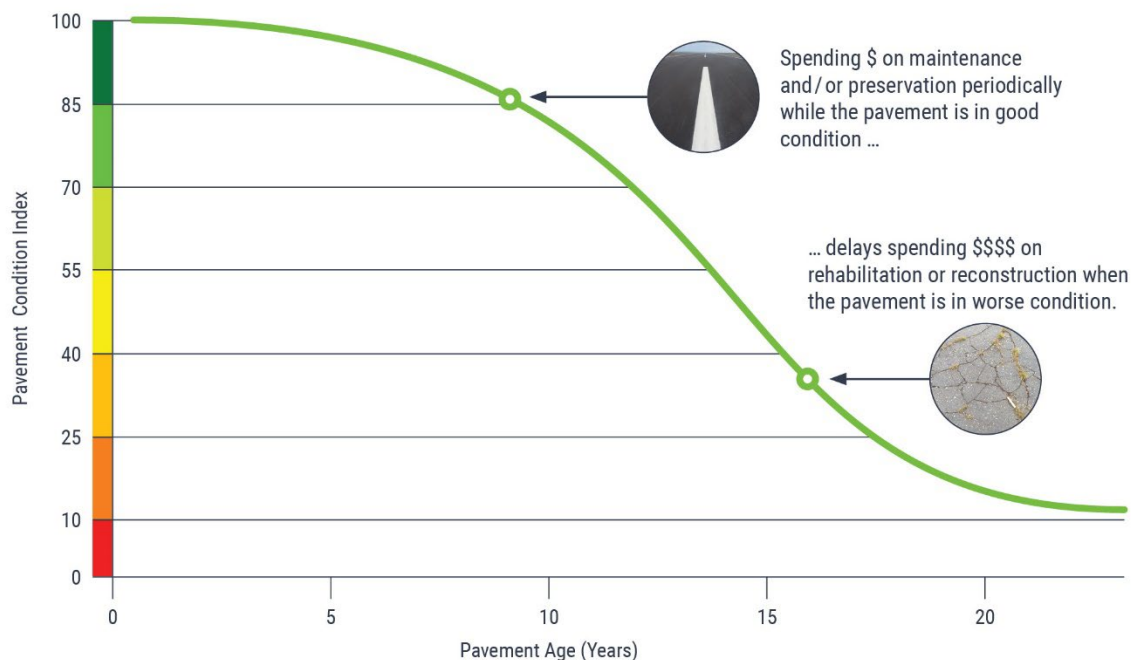
## INTRODUCTION

Applied Pavement Technology, Inc. (APTech), with assistance from Robinson Engineering Company Consulting Engineers (Robinson), updated the Airport Pavement Management System (APMS) for the Iowa Department of Transportation, Modal Transportation Bureau (Iowa DOT). The APMS provides a means to monitor the condition of the pavements within the State of Iowa and to proactively plan for their preservation.

As part of this project, pavement conditions at Waukon Municipal Airport were visually assessed in March 2025 using the Pavement Condition Index (PCI) procedure. During a PCI inspection, the types, severities, and amounts of distress present on the pavement surface are quantified. This information is then used to develop a composite index that represents the overall condition of the pavement in numerical terms, ranging from 0 (*Failed*) to 100 (*Excellent*). The PCI provides an overall measure of condition and an indication of the level of work that will be required to maintain or repair a pavement. The distress information also provides insight into what is causing the pavement to deteriorate, which is the first step in selecting the appropriate repair action to correct the problem.

Programmed into an APMS, PCI data and results are used to determine when preventive maintenance actions (such as crack or joint sealing) are advisable and to identify the most cost-effective time to perform major rehabilitation (such as an overlay or whitetopping). Delaying maintenance and rehabilitation (M&R) until a pavement structure has seriously degraded can cost many times more than if M&R was applied earlier in a pavement's life cycle, as shown in Figure 1. From a safety perspective, pavement distresses, such as cracks and loose debris, may pose risks in terms of the potential for aircraft tire damage and the ability of a pilot to safely control aircraft.

Figure 1. Pavement condition versus cost of repair.



The pavement evaluation results for Waukon Municipal Airport are presented within this report and can be used by Waukon Municipal Airport, the Iowa DOT, and the Federal Aviation Administration (FAA) to identify, prioritize, and schedule pavement M&R actions at the airport. In addition to this report, the web-based interactive pavement data visualization tool IDEA, containing the information collected during this project, was updated and may be accessed from the [Iowa DOT's website](#) or directly ([Iowa APMS IDEA](#)).

## PAVEMENT INVENTORY

The project began with a review of the existing inventory information pertaining to the pavements at Waukon Municipal Airport. The date of original construction, along with the date of any subsequent rehabilitation; the location of completed work; and the type of work undertaken were gathered. The information was used to update the pavement management database and associated maps, as necessary, to account for pavement-related work that had been undertaken since the last time the airport was evaluated in 2018.

The pavement network at Waukon Municipal Airport was then divided into branches, sections, and sample units. A branch is a single entity that serves a distinct function. For example, a runway is considered a branch because it serves a single function (allowing aircraft to take off and land). Taxiways, aprons, and T-hangars are also separate branches.

Each branch was further divided into sections. Traditionally, sections are defined as parts of the branch that share common attributes, such as cross section, date of last construction, traffic level, and performance. Using this approach, if a runway was built in 1968 and then extended in 1984, it would contain two separate sections.

To estimate the overall condition of a pavement section, each section was subdivided into sample units. Portions of these sample units were evaluated during the pavement inspection, and the collected information was extrapolated to predict the overall section condition and quantities of distress.

Approximately 170,600 square feet of pavement were evaluated at Waukon Municipal Airport, as illustrated in Figure 2. This figure also shows the area-weighted age in years of the pavements at the time of the inspection. Figure 3 provides a map that details how the pavement network was divided into management units and identifies the sample units that were evaluated during the pavement inspection at Waukon Municipal Airport.

Figure 2. Pavement area by branch use at Waukon Municipal Airport.

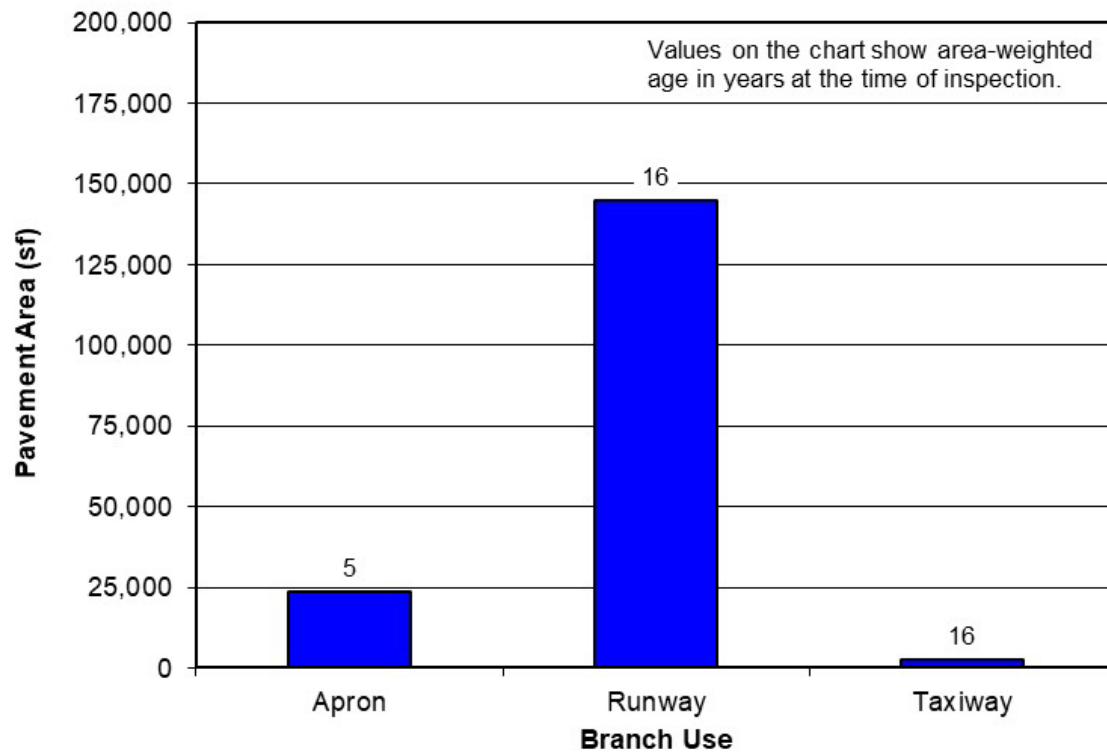
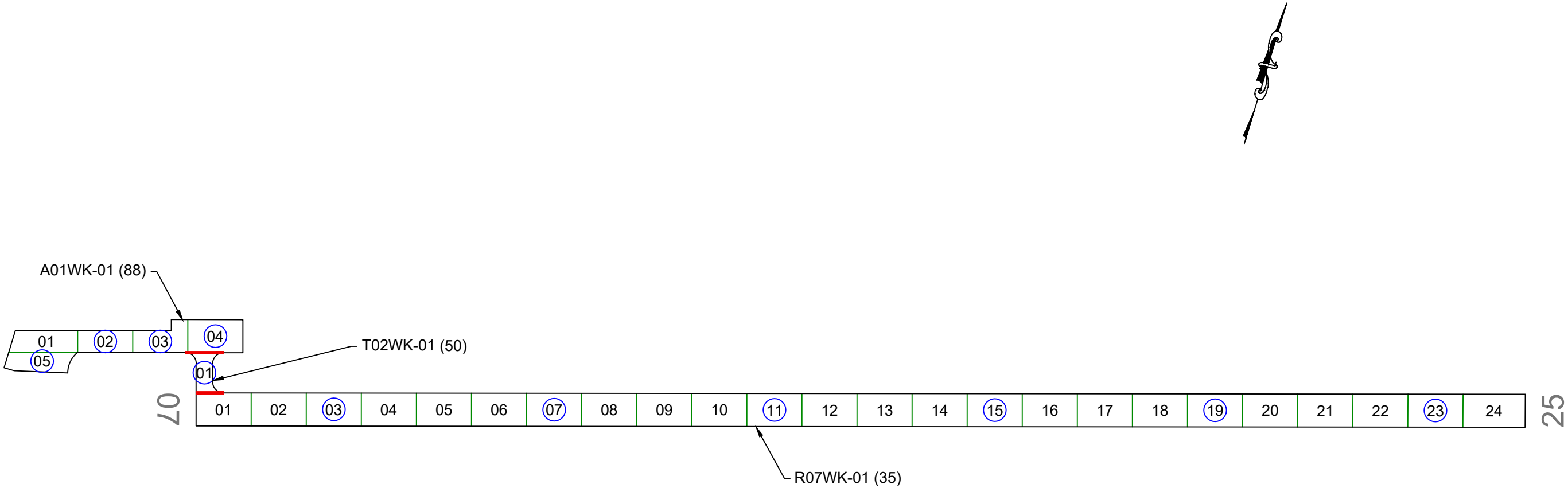


FIGURE 3. NETWORK DEFINITION MAP.



NETWORK DEFINITION LEGEND

- BRANCH IDENTIFIER
- SECTION IDENTIFIER
- PCI VALUE
- SECTION BREAK LINE
- SAMPLE UNIT BREAK LINE
- SLAB JOINT
- SAMPLE UNIT NUMBER
- SAMPLE UNIT INSPECTED
- ADDITIONAL SAMPLE UNIT

|                                                                                                         |                                  |                                  |                              |
|---------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------|------------------------------|
| <b>applied pavement</b> TECHNOLOGY                                                                      |                                  |                                  |                              |
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| AGENCY: Iowa Department of Transportation                                                               |                                  |                                  |                              |
| Office of Aviation                                                                                      |                                  |                                  |                              |
| LOCATION: Waukon Municipal Airport                                                                      |                                  |                                  |                              |
| Waukon, Iowa                                                                                            |                                  |                                  |                              |
| PAGE TITLE: Network Definition Map                                                                      |                                  |                                  |                              |
| PROJECT DATE:<br>NOV. 2024                                                                              | CREATION DATE:<br>NOV. 2024      | PROJECT MANAGER:<br>LJR          | JOB NUMBER:<br>2021-125-AM03 |
| DRAWING SCALE:<br>1"=200'                                                                               | LAST MODIFIED DATE:<br>JUN. 2025 | REVISED BY:<br>KEW               | DRAWN BY:<br>KEW             |
| FILENAME:<br>Waukon.dwg                                                                                 |                                  | LAYOUT NAME/NUMBER:<br>NET. DEF. | PAGE NUMBER:<br>5            |

## PAVEMENT EVALUATION

### Pavement Evaluation Procedure

APTech visually inspected the pavements at Waukon Municipal Airport using the PCI procedure described in:

- FAA Advisory Circular 150/5380-6C, [\*Guidelines and Procedures for Maintenance of Airport Pavements\*](#).
- FAA Advisory Circular 150/5380-7B, [\*Airport Pavement Management Program \(PMP\)\*](#).
- ASTM D5340, *Standard Test Method for Airport Pavement Condition Index Surveys*.

During the PCI inspection, a cursory inspection of the entirety of a pavement section was performed. Sample units identified for more detailed inspection were verified, and adjustments to the selected sample units for inspection were made as needed to ensure an accurate assessment of the pavement's condition. Data pertaining to the types, severities, and quantities of observed pavement distresses were then collected within each sample unit. These data were then used to calculate the composite PCI of each pavement section. The PCI provides a numerical indication of overall pavement condition, as illustrated in Figure 4. The PCI ranges from a value of 0, which represents a pavement in a *Failed* condition, to a value of 100, which represents a pavement in *Excellent* condition with no visible signs of deterioration. It is important to note that factors other than overall PCI need to be considered when identifying the appropriate type of repair, including types of distress present and rate of deterioration. Also, since the PCI does not assess the structural integrity or capacity of the pavement structure, further testing may be needed to validate and refine the treatment strategy.

Figure 4. Visual representation of PCI scale on typical pavement surfaces.



Note: Photographs shown are not specific to Waukon Municipal Airport.

Generally, pavements with relatively high PCIs that are not exhibiting significant load-related distress will benefit from preventive maintenance actions, such as crack sealing or joint resealing. As the PCI drops, the pavements may require major rehabilitation, such as an overlay or whitetopping. In some situations where the PCI has dropped low enough, reconstruction may be the only viable alternative due to the substantial damage to the pavement structure. Figure 5 illustrates how the appropriate repair type varies with the PCI of a pavement section and provides the corresponding colors used for the maps and charts in this report for each range of PCIs.

Figure 5. PCI versus repair type.

| PCI Range | Repair                 |
|-----------|------------------------|
| 86-100    | Preventive Maintenance |
| 71-85     |                        |
| 56-70     |                        |
| 41-55     | Major Rehabilitation   |
| 26-40     | Reconstruction         |
| 11-25     |                        |
| 0-10      |                        |

The types of distress identified during the PCI inspection provide insight into the cause of pavement deterioration, which is useful when selecting M&R strategies. Understanding the cause of distress helps in selecting a rehabilitation alternative that corrects the cause and thus eliminates or delays its recurrence. PCI distress types are characterized as:

- **Load-related**—These distress types are defined as being caused by aircraft or vehicular traffic and may indicate a structural deficiency. Examples of load-related distress include alligator cracking on asphalt-surfaced pavements and corner breaks on portland cement concrete (PCC) pavements.
- **Climate/durability-related**—These distress types often signify the presence of aged or environmentally susceptible (or both) material and include durability-related issues. Examples of climate/durability-related distress include weathering on asphalt-surfaced pavements, which is climate-related, and durability cracking on PCC pavements, which is durability-related.
- **Other**—Distress types that fall into this category cannot be attributed solely to load or climate/durability. Examples of this type of distress include depressions on asphalt-surfaced pavements and shrinkage cracking on PCC pavements.

Appendix A identifies the distress types considered during a PCI inspection and describes the likely cause of each distress type. It should be noted that a PCI is based on visual signs of pavement deterioration and does not provide a measure of structural capacity.

## Pavement Evaluation Results

The pavements at Waukon Municipal Airport were inspected in March 2025. The 2025 area-weighted condition of Waukon Municipal Airport is 42, with conditions ranging from 35 to 88 (on a scale of 0 [failed] to 100 [excellent]). During the previous pavement inspection in 2018, the area-weighted PCI of the airport was 43.

Figure 6 summarizes the overall condition of the pavements at Waukon Municipal Airport, and Figure 7 presents area-weighted condition (average PCI adjusted to account for the relative size of the pavement sections) by branch use. Figure 8 is a map that displays the condition of the evaluated pavements. Table 1 summarizes the results of the pavement evaluation. Appendix B presents photographs taken during the PCI inspection, and Appendix C contains detailed information on the distress types observed during the visual survey. Appendix D includes detailed work history information that was collected during the record review process.

Figure 6. Pavement area by PCI range at Waukon Municipal Airport.

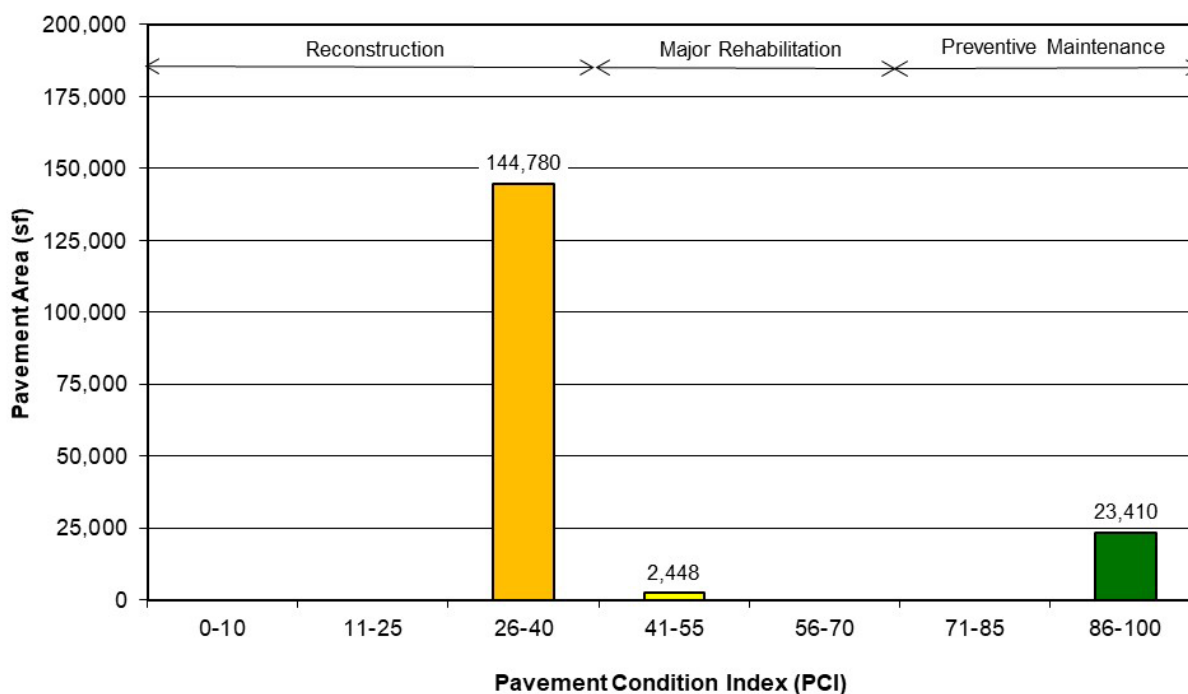


Figure 7. Area-weighted PCI by branch use at Waukon Municipal Airport.

(Values on chart are area weighted.)

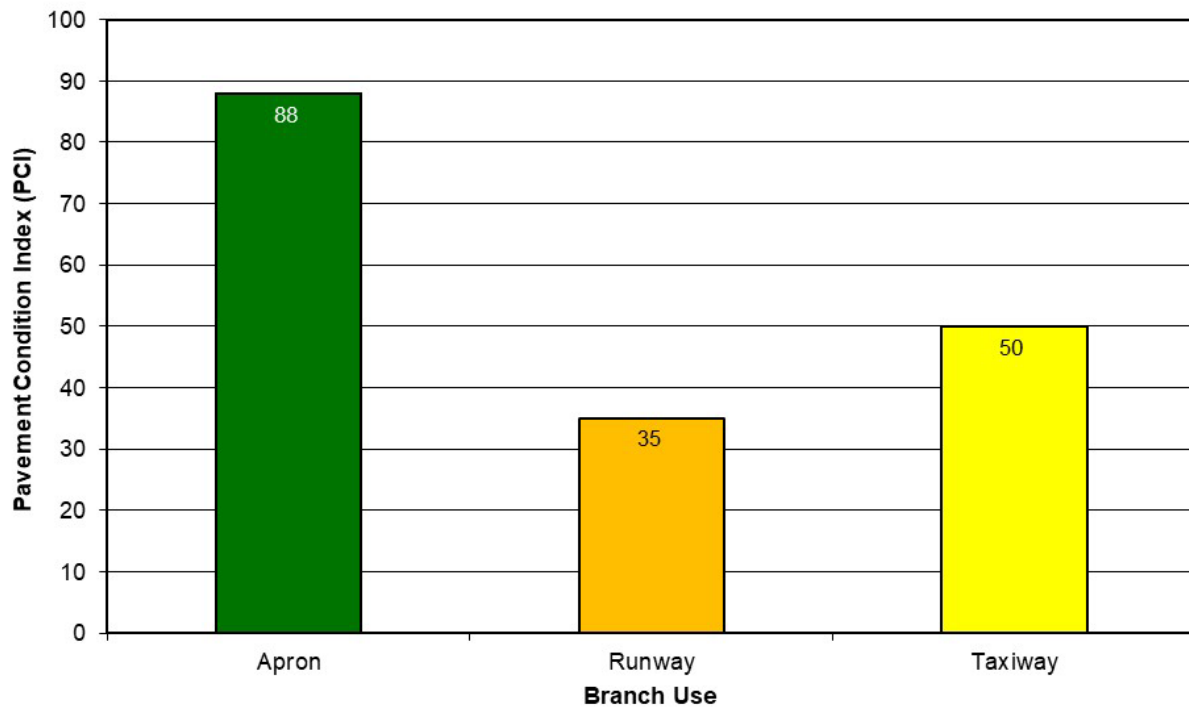
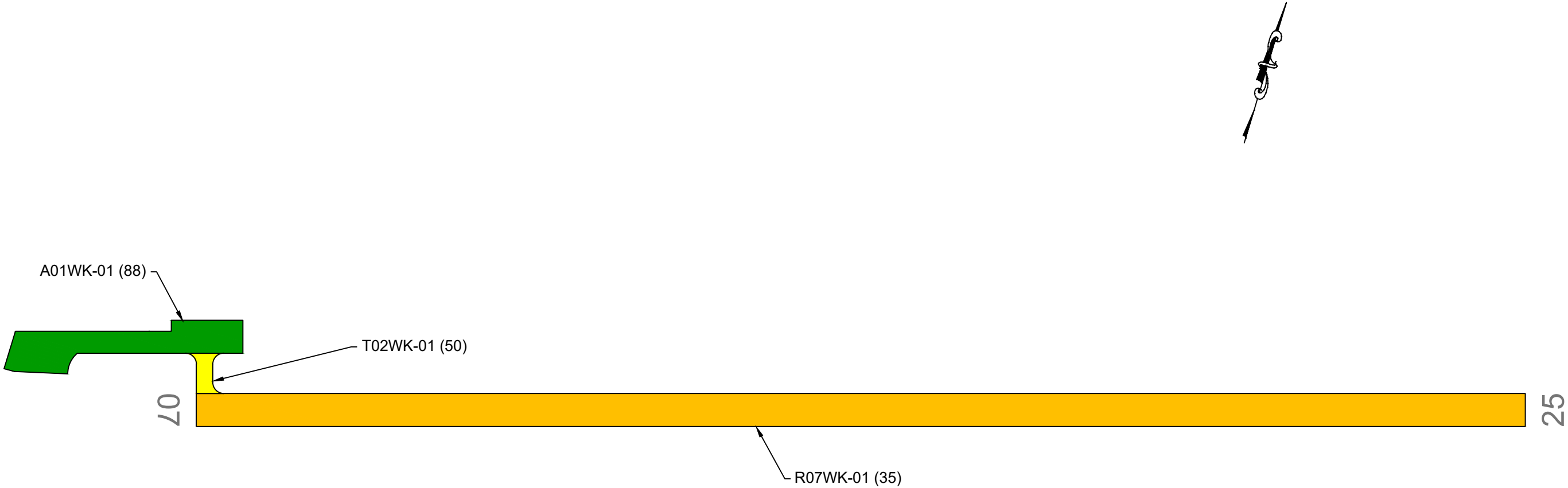


FIGURE 8. PCI MAP.



LEGEND

BRANCH IDENTIFIER

SECTION IDENTIFIER

PCI VALUE

SECTION BREAK LINE

PAVEMENT CONDITION INDEX

PCI

|        |
|--------|
| 86-100 |
| 71-85  |
| 56-70  |
| 41-55  |
| 26-40  |
| 11-25  |
| 0-10   |

**applied pavement**  
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AGENCY: Iowa Department of Transportation  
Office of Aviation

LOCATION: Waukon Municipal Airport  
Waukon, Iowa

PAGE TITLE: 2025 Pavement Condition Index Map

|                            |                                  |                            |                              |
|----------------------------|----------------------------------|----------------------------|------------------------------|
| PROJECT DATE:<br>NOV. 2024 | CREATION DATE:<br>NOV. 2024      | PROJECT MANAGER:<br>LJR    | JOB NUMBER:<br>2021-125-AM03 |
| DRAWING SCALE:<br>1"=200'  | LAST MODIFIED DATE:<br>JUN. 2025 | REVISED BY:<br>KEW         | DRAWN BY:<br>KEW             |
| FILENAME:<br>Waukon.dwg    |                                  | LAYOUT NAME/NUMBER:<br>PCI | PAGE NUMBER:<br>10           |

Table 1. 2025 pavement evaluation results.

| Branch | Section | Surface Type | Section Area (sf) | LCD      | 2025 PCI | % Distress Due to Load | % Distress Due to Climate/Durability | % Distress Due to Other | Type of Distress                             |
|--------|---------|--------------|-------------------|----------|----------|------------------------|--------------------------------------|-------------------------|----------------------------------------------|
| A01WK  | 01      | AAC          | 23,410            | 6/1/2020 | 88       | 0                      | 100                                  | 0                       | L&T Cracking, Raveling, Weathering           |
| R07WK  | 01      | AC           | 144,780           | 4/1/2009 | 35       | 44                     | 56                                   | 0                       | Alligator Cracking, L&T Cracking, Weathering |
| T02WK  | 01      | AC           | 2,448             | 4/1/2009 | 50       | 41                     | 59                                   | 0                       | Alligator Cracking, L&T Cracking, Weathering |

## Table Notes:

1. See Figure 3 for the location of the branch and section.
2. Surface Type: AC = asphalt cement concrete; AAC = asphalt overlay on AC; PCC = portland cement concrete; APC = asphalt overlay on PCC.
3. LCD = last construction date.
4. Distress due to load includes distress types that are attributed to a structural deficiency in the pavement, such as alligator cracking or rutting on asphalt-surfaced pavements or shattered slabs on PCC pavements.
5. Distress due to climate or durability includes distress types that are attributed to either the aging of the pavement and the effects of the environment (such as weathering, raveling, or block cracking on asphalt-surfaced pavements) or to a materials-related problem (such as durability cracking or alkali-silica reaction [ASR] on PCC pavements). If materials-related distresses were recorded during the inspection, further laboratory testing is required to definitively determine the type present.
6. Distress due to other refers to distress types that are not attributed to one factor but rather may be caused by a combination of factors.
7. Distress types are defined by ASTM D5340. L&T cracking = longitudinal and transverse cracking; LTD cracking = longitudinal, transverse, and diagonal cracking; ASR = alkali-silica reaction.

## **Inspection Comments**

Waukon Municipal Airport was inspected on March 14, 2025. There were three pavement sections defined during the inspection.

### ***Runway***

Runway 07/25 consisted of one section that was in *Poor* condition. Distresses identified during the inspection included medium-severity alligator cracking, high-severity weathering, and all severities of longitudinal and transverse (L&T) cracking. Some medium-severity alligator cracking was recorded in the wheel path. The low-severity L&T cracking was unsealed; the medium-severity L&T cracking was either due to crack sealant that was no longer satisfactory, unsealed crack widths that exceeded 1/4 inch, or the development of secondary cracking; and the high-severity L&T cracking was recorded in areas where the crack width was greater than 3 inches.

### ***Taxiway***

The taxiway contained one section with medium-severity alligator cracking, high-severity weathering, and low- and medium-severity L&T cracking recorded during the inspection. Some medium-severity alligator cracking was recorded in the wheel path. The low-severity L&T cracking was sealed, while the medium-severity L&T cracking was due to unsatisfactory crack sealant.

### ***Apron***

The apron area was defined by one section that contained areas of low- and medium-severity L&T cracking, medium- and high-severity raveling, and low-severity weathering. The low-severity L&T cracking was unsealed, while the medium-severity L&T cracking was where the cracking was due to unsealed crack widths greater than 1/4 inch.

## PAVEMENT MAINTENANCE AND REHABILITATION PROGRAM

Using the information collected during the pavement inspection, the PAVER pavement management software was used to develop a 5-year M&R program for Waukon Municipal Airport. In addition, a 1-year plan for localized preventive maintenance (such as crack sealing and patching) was prepared.

### Analysis Parameters

#### ***Critical PCIs***

PAVER uses critical PCIs to determine whether localized preventive maintenance or major rehabilitation is the appropriate repair action. Above the critical PCI, localized preventive maintenance activities are recommended. Below the critical PCI, major rehabilitation actions, such as an overlay or reconstruction, are recommended. The Iowa DOT set the critical PCIs at 65 for runways, 60 for taxiways, and 55 for aprons and T-hangars.

#### ***Localized Preventive Maintenance Policies and Unit Costs***

Localized preventive maintenance policies were developed for asphalt-surfaced and PCC pavements. These policies, shown in Appendix E, identify the localized preventive maintenance actions that the Iowa DOT considered appropriate to correct the different distress types and severities. The Iowa DOT provided unit costs for each of the localized preventive maintenance actions included in these policies, and these costs are detailed in Appendix E. Please note that this information is of a general nature for the entire State. The localized preventive maintenance policies and unit costs may require adjustments to reflect specific conditions at Waukon Municipal Airport.

#### ***Major Rehabilitation Unit Costs***

PAVER estimates the cost of major rehabilitation based on the predicted PCI of the pavement section. The Iowa DOT provided the costs for major rehabilitation, and they are presented in Appendix E. If major rehabilitation is recommended in the 5-year program, further engineering investigation will be needed to identify the most appropriate rehabilitation action and to estimate the cost of such work more accurately.

#### ***Budget and Inflation Rate***

An unlimited budget with a start date of July 1, 2025, and an inflation rate of 2.3 percent was used during the analysis.

### Analysis Approach

The 5-year M&R program was prepared with the goal of maintaining the pavements above established critical PCIs. During this analysis, major rehabilitation was recommended for pavements in the year they dropped below their critical PCI. For the first year (2025) of the analysis only, a localized preventive maintenance plan was developed for those pavement sections that were above their critical PCI. If major rehabilitation was triggered for a section in 2026 or 2027, then localized preventive maintenance was not recommended for 2025. While localized preventive maintenance should be an annual undertaking at Waukon Municipal Airport, it is not possible to accurately predict the propagation of cracking and other distress types. Therefore, the airport should budget for maintenance every year and can use the 2025 localized preventive maintenance plan as a baseline for that work. As the pavements age, it can be assumed that the amount of localized preventive maintenance required will increase.

## Analysis Results

A summary of the M&R program for Waukon Municipal Airport is presented in Table 2. Detailed information on the recommended localized preventive maintenance plan for 2025 is provided in Appendix F.

Table 2. 5-year M&R program under an unlimited funding analysis scenario.

| Year | Branch | Section | Surface Type | Type of Repair         | Estimated Cost |
|------|--------|---------|--------------|------------------------|----------------|
| 2025 | A01WK  | 01      | AAC          | Preventive Maintenance | \$201          |
| 2025 | R07WK  | 01      | AC           | Major Rehabilitation   | \$1,634,505    |
| 2025 | T02WK  | 01      | AC           | Major Rehabilitation   | \$14,252       |

**Total Estimated Cost: \$1,649,000**

Table Notes:

1. See Figure 3 for the location of the branch and section.
2. Surface Type: AC = asphalt cement concrete; AAC = asphalt overlay on AC; PCC = portland cement concrete; APC = asphalt overlay on PCC.
3. Type of Repair: Major Rehabilitation, such as pavement reconstruction or an overlay; Localized Preventive Maintenance, such as crack sealing or patching.
4. The estimated costs provided are of a general nature for the entire State and may require adjustments to reflect specific conditions at Waukon Municipal Airport.

The recommendations made in this report are based on a broad network-level analysis and meant to provide Waukon Municipal Airport with an indication of the type of pavement-related work required during the next 5 years. Further engineering investigation may be necessary to identify which repair action is most appropriate. In addition, the cost estimates provided are based on overall unit costs for the entire State, and Waukon Municipal Airport should adjust the plan to reflect local costs.

Because an unlimited budget was used in the analysis, it is possible that the pavement repair program may need to be adjusted to consider economic or operational constraints. The identification of a project need does not necessarily mean that State or Federal funding will be available in the year it is indicated. It is important to remember that regardless of the recommendations presented within this report, Waukon Municipal Airport is responsible for repairing pavements where existing conditions pose a hazard to safe operations.

## General Maintenance Recommendations

In addition to the specific maintenance actions presented in Appendix F, it is recommended that the following strategies be considered for prolonging pavement life:

1. Regularly inspect all safety areas of the airport and document all inspection activity.
2. Conduct an aggressive campaign against weed growth through timely herbicide applications and mowing programs of the safety areas. Vegetation growth in pavement cracks is destructive and significantly increases the rate of pavement deterioration.
3. Implement a periodic crack and joint sealing program. Keeping water and debris out of the pavement system by sealing cracks and joints is a proven and cost-effective method for extending the life of the pavement system.

4. Ensure all edges of pavement maintain the required 1.5-inch lip. This enables the water to drain away from the pavement system.
5. Closely monitor the movement of heavy equipment (particularly farming, construction, mowing, and fueling equipment) to make sure it is only operating on pavements that are designed to accommodate heavy loads. Failure to restrict heavy equipment to appropriate areas may result in the premature failure of airport pavements.

## SUMMARY

This report documents the results of the pavement evaluation conducted at Waukon Municipal Airport. A visual inspection of the pavements in 2025 found that the overall condition of the pavement network is a PCI of 42. A 5-year pavement repair program, shown in Table 2, was generated for Waukon Municipal Airport, which revealed that approximately \$1,649,000 needs to be expended on M&R. Waukon Municipal Airport should utilize these study results to assist in planning for future maintenance needs as part of the airport CIP planning process.

---

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## **APPENDIX A**

### **CAUSE OF DISTRESS TABLES**

Table A-1. Cause of pavement distress, asphalt-surfaced pavements (USACE 2009a).

| <b>Distress Type</b>      | <b>Probable Cause of Distress</b>                                                                                                                                                                                                    |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alligator Cracking        | Fatigue failure of the asphalt surface under repeated traffic loading.                                                                                                                                                               |
| Bleeding                  | Excessive amounts of asphalt cement or tars in the mix or low air void content, or both.                                                                                                                                             |
| Block Cracking            | Shrinkage of the asphalt and daily temperature cycling; it is not load associated.                                                                                                                                                   |
| Corrugation               | Traffic action combined with an unstable pavement layer.                                                                                                                                                                             |
| Depression                | Settlement of the foundation soil or can be “built up” during construction.                                                                                                                                                          |
| Jet-Blast Erosion         | Bituminous binder has been burned or carbonized.                                                                                                                                                                                     |
| Joint Reflection Cracking | Movement of the concrete slab beneath the asphalt surface due to thermal and moisture changes.                                                                                                                                       |
| L&T Cracking              | Cracks may be caused by (1) a poorly constructed paving lane joint, (2) shrinkage of the asphalt surface due to low temperatures or hardening of the asphalt, or (3) reflective cracking caused by cracks in an underlying PCC slab. |
| Oil Spillage              | Deterioration or softening of the pavement surface caused by the spilling of oil, fuel, or other solvents.                                                                                                                           |
| Patching                  | N/A                                                                                                                                                                                                                                  |
| Polished Aggregate        | Repeated traffic applications.                                                                                                                                                                                                       |
| Raveling                  | Asphalt binder may have hardened significantly, causing coarse aggregate pieces to dislodge.                                                                                                                                         |
| Rutting                   | Usually caused by consolidation or lateral movement of the materials due to traffic loads.                                                                                                                                           |
| Shoving                   | Where PCC pavements adjoin flexible pavements, PCC “growth” may shove the asphalt pavement.                                                                                                                                          |
| Slippage Cracking         | Low-strength surface mix or poor bond between the surface and the next layer of the pavement structure.                                                                                                                              |
| Swelling                  | Usually caused by frost action or by swelling soil.                                                                                                                                                                                  |
| Weathering                | Asphalt binder and/or fine aggregate may wear away as the pavement ages and hardens.                                                                                                                                                 |

Table A-2. Cause of pavement distress, PCC pavements (USACE 2009b).

| <b>Distress Type</b>           | <b>Probable Cause of Distress</b>                                                                                                                                             |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ASR                            | Chemical reaction of alkalis in the cement with certain reactive silica minerals. ASR may be accelerated by the use of chemical pavement deicers.                             |
| Blowup                         | Incompressible materials in the joints.                                                                                                                                       |
| Corner Break                   | Load repetition combined with loss of support and curling stresses.                                                                                                           |
| Durability Cracking            | Concrete's inability to withstand environmental factors, such as freeze-thaw cycles.                                                                                          |
| Faulting                       | Upheaval or consolidation.                                                                                                                                                    |
| Joint Seal Damage              | Stripping of joint sealant, extrusion of joint sealant, weed growth, hardening of the filler (oxidation), loss of bond to the slab edges, or absence of sealant in the joint. |
| LTD Cracking                   | Combination of load repetition, curling stresses, and shrinkage stresses.                                                                                                     |
| Patching<br>(Small and Large)  | N/A                                                                                                                                                                           |
| Popouts                        | Freeze-thaw action in combination with expansive aggregates.                                                                                                                  |
| Pumping                        | Poor drainage, poor joint sealant.                                                                                                                                            |
| Scaling                        | Over finishing of concrete, deicing salts, improper construction, freeze-thaw cycles, and poor aggregate.                                                                     |
| Shattered Slab                 | Load repetition.                                                                                                                                                              |
| Shrinkage Cracking             | Setting and curing of the concrete.                                                                                                                                           |
| Spalling<br>(Joint and Corner) | Excessive stresses at the joint caused by infiltration of incompressible materials or traffic loads; weak concrete at the joint combined with traffic loads.                  |

**APPENDIX B**

**INSPECTION PHOTOGRAPHS**

A01WK-01. Overview.



A01WK-01. L&T Cracking (Sample Unit No. 03).



A01WK-01. Raveling (Sample Unit No. 04).



A01WK-01. Weathering (Sample Unit No. 04).



R07WK-01. Overview.



R07WK-01. Alligator Cracking (Sample Unit No. 15).



R07WK-01. Alligator Cracking (Sample Unit No. 23).



R07WK-01. L&T Cracking (Sample Unit No. 03).



R07WK-01. L&T Cracking (Sample Unit No. 19).



R07WK-01. Weathering (Sample Unit No. 23).



T02WK-01. Overview.



T02WK-01. Alligator Cracking (Sample Unit No. 01).



T02WK-01. L&T Cracking (Sample Unit No. 01).



T02WK-01. Weathering (Sample Unit No. 01).



## **APPENDIX C**

### **INSPECTION REPORT**

RE-INSPECTION REPORT  
WAUKON MUNICIPAL AIRPORT

Pavement Database: IA 2024  
Network ID: Y01

Generate Date: 8/11/2025  
Page 1

Branch - Section ID: A01WK - 001

Branch Name: APRONUse: APRON

LCD: 6/1/2020

Surface Type: AAC

Rank: P

Section Area (sf): 23,410.00

Length (ft): 410.00

Width (ft): 70.00

From: WEST END OF APRON

To: EAST END OF APRON

Slabs:

Slab Length (ft):

Slab Width (ft):

Joint Length (ft):

Last Insp Date: 3/14/2025

PCI: 88

Total Samples: 5

Surveyed: 4

PCI Family: IowaAACAP\_Northern

Section Comments:

Inspection Comments:

Sample Number: 02

Sample Type: R

Sample PCI: 94

Sample Area (SF): 4,000.00

57 WEATHERING

L

4,000.00 SF

Sample Comments:

Sample Number: 03

Sample Type: R

Sample PCI: 79

Sample Area (SF): 4,600.00

48 L & T CR

48 L & T CR

52 RAVELING

52 RAVELING

57 WEATHERING

L

M

H

M

L

40.00 FT

12.00 FT

1.00 SF

2.00 SF

4,597.00 SF

lu

w

MD

Sample Comments:

Sample Number: 04

Sample Type: R

Sample PCI: 89

Sample Area (SF): 6,000.00

52 RAVELING

57 WEATHERING

H

L

3.00 SF

5,997.00 SF

MD

Sample Comments:

Sample Number: 05

Sample Type: R

Sample PCI: 90

Sample Area (SF): 4,047.00

52 RAVELING

57 WEATHERING

M

L

2.00 SF

4,045.00 SF

Sample Comments:

RE-INSPECTION REPORT  
WAUKON MUNICIPAL AIRPORT

Pavement Database: IA 2024  
Network ID: Y01

Generate Date: 8/11/2025  
Page 2

Branch - Section ID: R07WK - 001

Branch Name: RUNWAY 07/25      Use: RUNWAY

LCD: 4/1/2009      PCI Family: IowaACRW\_NE

Surface Type: AC

Rank: P

Section Area (sf): 144,780.00

Length (ft): 2,413.00

Width (ft): 60.00

From: WEST END OF RWY

To: 300' FROM E END OF RWY

Slabs:

Slab Length (ft):

Slab Width (ft):

Joint Length (ft):

Last Insp Date: 3/14/2025

PCI: 35

Total Samples: 24

Surveyed: 6

Section Comments:

Inspection Comments:

Sample Number: 03

Sample Type: R

Sample PCI: 48

Sample Area (SF): 6,000.00

Sample Comments:

|                 |   |             |         |
|-----------------|---|-------------|---------|
| 41 ALLIGATOR CR | M | 40.00 SF    |         |
| 48 L & T CR     | L | 20.00 FT    | Is      |
| 48 L & T CR     | M | 361.00 FT   | fs 2ndy |
| 57 WEATHERING   | H | 1,100.00 SF |         |

Sample Number: 07

Sample Type: R

Sample PCI: 36

Sample Area (SF): 6,000.00

Sample Comments:

|                 |   |             |         |
|-----------------|---|-------------|---------|
| 41 ALLIGATOR CR | M | 300.00 SF   |         |
| 48 L & T CR     | L | 45.00 FT    | Is      |
| 48 L & T CR     | M | 300.00 FT   | fs 2ndy |
| 57 WEATHERING   | H | 1,100.00 SF |         |

Sample Number: 11

Sample Type: R

Sample PCI: 36

Sample Area (SF): 6,000.00

Sample Comments:

|                 |   |             |     |
|-----------------|---|-------------|-----|
| 41 ALLIGATOR CR | M | 110.00 SF   |     |
| 48 L & T CR     | H | 10.00 FT    | 3in |
| 48 L & T CR     | M | 510.00 FT   | fs  |
| 57 WEATHERING   | H | 1,100.00 SF |     |

Sample Number: 15

Sample Type: R

Sample PCI: 30

Sample Area (SF): 6,000.00

Sample Comments:

|                 |   |             |    |
|-----------------|---|-------------|----|
| 41 ALLIGATOR CR | M | 555.00 SF   |    |
| 48 L & T CR     | M | 392.00 FT   | fs |
| 57 WEATHERING   | H | 1,100.00 SF |    |

RE-INSPECTION REPORT  
WAUKON MUNICIPAL AIRPORT

Pavement Database: IA 2024  
Network ID: Y01

Generate Date: 8/11/2025  
Page 3

Sample Number: 19

Sample Type: R  
Sample PCI: 38  
Sample Area (SF): 6,000.00

Sample Comments:

|                 |   |             |     |
|-----------------|---|-------------|-----|
| 41 ALLIGATOR CR | M | 100.00 SF   |     |
| 48 L & T CR     | H | 25.00 FT    | 3in |
| 48 L & T CR     | L | 69.00 FT    | ls  |
| 48 L & T CR     | M | 430.00 FT   | fs  |
| 57 WEATHERING   | H | 1,100.00 SF |     |

Sample Number: 23

Sample Type: R  
Sample PCI: 18  
Sample Area (SF): 6,000.00

Sample Comments:

|                 |   |             |      |
|-----------------|---|-------------|------|
| 41 ALLIGATOR CR | M | 1,990.00 SF |      |
| 48 L & T CR     | M | 316.00 FT   | fs w |
| 57 WEATHERING   | H | 1,100.00 SF | ST   |

# RE-INSPECTION REPORT WAUKON MUNICIPAL AIRPORT

## Pavement Database: IA 2024

Generate Date: 8/11/2025

Network ID: Y01

Page 4

**Branch - Section ID: T02WK - 001**

Branch Name: TAXIWAY 02

Use: TAXIWAY

LCD: 4/1/2009

PCI Family: IowaACTW\_NE

Surface Type: AC

Rank: P

Section Area (sf): 2,448.00

Length (ft): 75.00

Width (ft): 25.00

From: SOUTH END OF TAXIWAY

To: NORTH END OF TAXIWAY

Slabs:

Section Comments:

Slab Length (ft):

Slab Width (ft):

Joint Length (ft):

Last Insp Date: 3/14/2025

Inspection Comments:

PCI: 50

Total Samples: 1

Surveyed: 1

**Sample Number: 01**

Sample Type: R

### Sample Comments:

Sample PCI: 50

Sample Area (SF): 2,448.00

41 ALLIGATOR CR

M

37.00 SF

48 L &amp; T CR

**L**

49.00 FT      ls

48 L &amp; T CR

M

30.00 FT fs

## 57 WEATHERING

H

490.00 SF ST

## **APPENDIX D**

### **WORK HISTORY REPORT**

# WORK HISTORY

Pavement Database: IA 2024  
Network ID: Y01

Generate Date: 6/30/2025  
Page 1

## Network: WAUKON MUNICIPAL AIRPORT

### Branch - Section ID: A01WK - 001

LCD: 6/1/2020  
Use: APRON  
Rank: P  
Surface: AAC

Length (ft): 410.00  
Width (ft): 70.00  
True Area (sf): 23,410.00

| Work Date  | Work Code | Work Description      | Cost   | Thickness (in) | Major MR | Comments |
|------------|-----------|-----------------------|--------|----------------|----------|----------|
| 06-01-2020 | OL-AC     | Overlay - AC          | \$0.00 | 0.00           | True     | GE est.  |
| 06-30-1976 | NC-AC     | New Construction - AC | \$0.00 | 0.00           | True     | -        |

### Branch - Section ID: R07WK - 001

LCD: 4/1/2009  
Use: RUNWAY  
Rank: P  
Surface: AC

Length (ft): 2,413.00  
Width (ft): 60.00  
True Area (sf): 144,780.00

| Work Date  | Work Code | Work Description              | Cost   | Thickness (in) | Major MR | Comments |
|------------|-----------|-------------------------------|--------|----------------|----------|----------|
| 06-01-2022 | ST-SC     | Surface Treatment - Seal Coat | \$0.00 | 0.00           | False    | GE est.  |
| 06-01-2022 | CS-AC     | Crack Sealing - AC            | \$0.00 | 0.00           | False    | -        |
| 04-01-2009 | CR-AC     | Complete Reconstruction - AC  | \$0.00 | 3.00           | True     | HMA      |
| 06-30-1976 | NC-AC     | New Construction - AC         | \$0.00 | 0.00           | True     | -        |

### Branch - Section ID: T02WK - 001

LCD: 4/1/2009  
Use: TAXIWAY  
Rank: P  
Surface: AC

Length (ft): 75.00  
Width (ft): 25.00  
True Area (sf): 2,448.00

| Work Date  | Work Code | Work Description              | Cost   | Thickness (in) | Major MR | Comments |
|------------|-----------|-------------------------------|--------|----------------|----------|----------|
| 06-01-2022 | ST-SC     | Surface Treatment - Seal Coat | \$0.00 | 0.00           | False    | GE est.  |
| 04-01-2009 | CR-AC     | Complete Reconstruction - AC  | \$0.00 | 3.00           | True     | HMA      |
| 06-30-1976 | NC-AC     | New Construction - AC         | \$0.00 | 0.00           | True     | -        |

## **APPENDIX E**

### **LOCALIZED PREVENTIVE MAINTENANCE POLICIES AND UNIT COST TABLES**

Table E-1. Localized preventive maintenance policy, asphalt-surfaced pavements.

| <b>Distress Type</b>      | <b>Severity Level</b> | <b>Maintenance Action</b> |
|---------------------------|-----------------------|---------------------------|
| Alligator Cracking        | Low                   | Monitor                   |
| Alligator Cracking        | Medium                | Asphalt Patch             |
| Alligator Cracking        | High                  | Asphalt Patch             |
| Bleeding                  | N/A                   | Monitor                   |
| Block Cracking            | Low                   | Monitor                   |
| Block Cracking            | Medium                | Crack Seal—Asphalt        |
| Block Cracking            | High                  | Crack Seal—Asphalt        |
| Corrugation               | Low                   | Monitor                   |
| Corrugation               | Medium                | Asphalt Patch             |
| Corrugation               | High                  | Asphalt Patch             |
| Depression                | Low                   | Monitor                   |
| Depression                | Medium                | Monitor                   |
| Depression                | High                  | Asphalt Patch             |
| Jet-Blast Erosion         | N/A                   | Asphalt Patch             |
| Joint Reflection Cracking | Low                   | Monitor                   |
| Joint Reflection Cracking | Medium                | Crack Seal—Asphalt        |
| Joint Reflection Cracking | High                  | Crack Seal—Asphalt        |
| L&T Cracking              | Low                   | Monitor                   |
| L&T Cracking              | Medium                | Crack Seal—Asphalt        |
| L&T Cracking              | High                  | Crack Seal—Asphalt        |
| Oil Spillage              | N/A                   | Asphalt Patch             |
| Patching                  | Low                   | Monitor                   |
| Patching                  | Medium                | Asphalt Patch             |
| Patching                  | High                  | Asphalt Patch             |
| Polished Aggregate        | N/A                   | Monitor                   |
| Raveling                  | Low                   | Monitor                   |
| Raveling                  | Medium                | Asphalt Patch             |
| Raveling                  | High                  | Asphalt Patch             |
| Rutting                   | Low                   | Monitor                   |
| Rutting                   | Medium                | Monitor                   |
| Rutting                   | High                  | Asphalt Patch             |
| Shoving                   | Low                   | Monitor                   |
| Shoving                   | Medium                | Asphalt Patch             |
| Shoving                   | High                  | Asphalt Patch             |
| Slippage Cracking         | N/A                   | Asphalt Patch             |
| Swelling                  | Low                   | Monitor                   |
| Swelling                  | Medium                | Monitor                   |
| Swelling                  | High                  | Asphalt Patch             |
| Weathering                | Low                   | Monitor                   |
| Weathering                | Medium                | Monitor                   |
| Weathering                | High                  | Asphalt Patch             |

Table E-2. Localized preventive maintenance policy, PCC pavements.

| <b>Distress Type</b>        | <b>Severity Level</b> | <b>Maintenance Action</b> |
|-----------------------------|-----------------------|---------------------------|
| ASR                         | Low                   | Monitor                   |
| ASR                         | Medium                | Slab Replacement          |
| ASR                         | High                  | Slab Replacement          |
| Blowup                      | Low                   | Slab Replacement          |
| Blowup                      | Medium                | Slab Replacement          |
| Blowup                      | High                  | Slab Replacement          |
| Corner Break                | Low                   | Crack Seal—PCC            |
| Corner Break                | Medium                | Full Depth PCC Patch      |
| Corner Break                | High                  | Full Depth PCC Patch      |
| Durability Cracking         | Low                   | Monitor                   |
| Durability Cracking         | Medium                | Full Depth Patch          |
| Durability Cracking         | High                  | Slab Replacement          |
| Faulting                    | Low                   | Monitor                   |
| Faulting                    | Medium                | Grinding                  |
| Faulting                    | High                  | Slab Replacement          |
| Joint Seal Damage           | Low                   | Monitor                   |
| Joint Seal Damage           | Medium                | Joint Seal                |
| Joint Seal Damage           | High                  | Joint Seal                |
| LTD Cracking                | Low                   | Monitor                   |
| LTD Cracking                | Medium                | Crack Seal—PCC            |
| LTD Cracking                | High                  | Slab Replacement          |
| Patching (Small and Large)  | Low                   | Monitor                   |
| Patching (Small and Large)  | Medium                | Full Depth PCC Patch      |
| Patching (Small and Large)  | High                  | Full Depth PCC Patch      |
| Popouts                     | N/A                   | Monitor                   |
| Pumping                     | N/A                   | Monitor                   |
| Scaling                     | Low                   | Monitor                   |
| Scaling                     | Medium                | Partial Depth PCC Patch   |
| Scaling                     | High                  | Slab Replacement          |
| Shattered Slab              | Low                   | Crack Seal—PCC            |
| Shattered Slab              | Medium                | Slab Replacement          |
| Shattered Slab              | High                  | Slab Replacement          |
| Shrinkage Cracking          | N/A                   | Monitor                   |
| Spalling (Joint and Corner) | Low                   | Monitor                   |
| Spalling (Joint and Corner) | Medium                | Partial Depth PCC Patch   |
| Spalling (Joint and Corner) | High                  | Partial Depth PCC Patch   |

Table E-3. 2025 unit costs for localized preventive maintenance actions.

| Maintenance Action                      | Unit Cost  |
|-----------------------------------------|------------|
| Asphalt Patch—Asphalt-Surfaced Pavement | \$15.90/sf |
| Crack Sealing—Asphalt-Surfaced Pavement | \$2.72/lf  |
| Partial Depth PCC Patch—PCC Pavement    | \$40.74/sf |
| Full Depth PCC Patch—PCC Pavement       | \$18.19/sf |
| Crack Sealing—PCC Pavement              | \$3.27/lf  |
| Joint Sealing—PCC Pavement              | \$3.27/lf  |
| Grinding—PCC Pavement                   | \$0.39/sf  |
| Slab Replacement—PCC Pavement           | \$18.19/sf |

Table Note: The unit cost estimates are based on broad statewide numbers and should be adjusted to reflect local costs.

Table E-4. 2025 unit costs (per square foot) based on pavement type and PCI ranges.

| Pavement Type    | PCI Range 0–40 | PCI Range 40–50 | PCI Range 50–60 | PCI Range 60–70 | PCI Range 70–80 | PCI Range 80–90 | PCI Range 90–100 |
|------------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|
| Asphalt-surfaced | \$11.29        | \$5.34          | \$5.34          | \$5.34          | \$0.00          | \$0.00          | \$0.00           |
| PCC              | \$18.86        | \$8.92          | \$8.92          | \$8.92          | \$0.00          | \$0.00          | \$0.00           |

Table Notes:

- The unit cost estimates are based on broad statewide numbers and should be adjusted to reflect local costs.
- Pavement Type: Asphalt-surfaced = AC (asphalt cement concrete), AAC (asphalt overlay on AC), or APC (asphalt overlay on PCC); PCC = portland cement concrete

## **APPENDIX F**

### **YEAR 2025 LOCALIZED PREVENTIVE MAINTENANCE DETAILS**

Table F-1. Year 2025 localized preventive maintenance details.

| Branch | Section | Distress Type | Severity | Distress Quantity | Distress Unit | Maintenance Action | Unit Cost | 2025 Estimated Cost |
|--------|---------|---------------|----------|-------------------|---------------|--------------------|-----------|---------------------|
| A01WK  | 01      | L&T Cracking  | Medium   | 15                | Ft            | Crack Sealing - AC | \$2.72    | \$41                |
| A01WK  | 01      | Raveling      | Medium   | 5                 | SqFt          | Patching - AC Deep | \$15.90   | \$80                |
| A01WK  | 01      | Raveling      | High     | 5                 | SqFt          | Patching - AC Deep | \$15.90   | \$80                |

## Table Notes:

1. See Figure 3 for the location of the branch and section.
2. Distress types are defined by ASTM D5340. L&T cracking = longitudinal and transverse cracking; LTD cracking = longitudinal, transverse, and diagonal cracking; ASR = alkali-silica reaction.
3. The costs provided are of a general nature for the entire State and may require adjustments to reflect specific conditions at Waukon Municipal Airport.



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