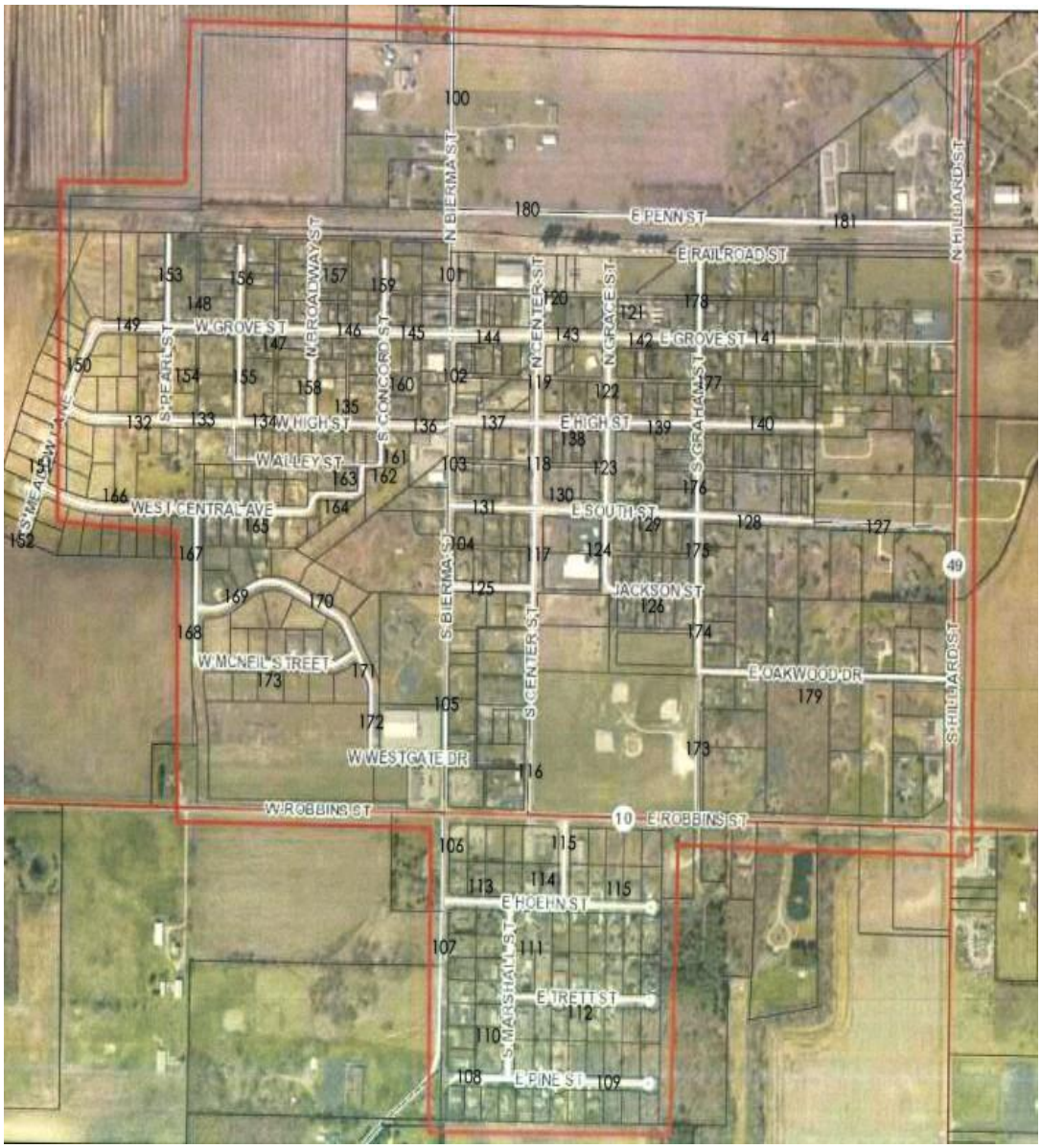


# Pavement Asset Management Plan

## For the:

## Town of Wheatfield

Last Updated: July 2018

McMAHON ENGINEERS ARCHITECTS
McMAHON ASSOCIATES, INC.
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Original: May 2016

ABONMARCHE
Confidence By Design

# Table of Contents



Last Updated: July 2018
May 2016

# Executive Summary

This document is the Town of Wheatfield's Asset Management Plan for its streets. It is intended to serve as a guiding document for all street work and improvements in the Town of Wheatfield. It has been developed using the Local Technical Assistance Program (LTAP) approved plan for the 2016 House Enrolled Act 1001 Grant Fund. The Asset Management Plan will be updated each year based on new information received. Although this plan reflects the best practices currently suggested to local public agencies across the state, it is tailored to the unique set of facts and circumstances applying to the Town of Wheatfield's street network. The plan will also evolve from year to year as the Town gains experience in applying various preventative maintenance techniques.

The Town has approximately 8 centerline miles of local roads that the Town is entirely responsible for maintaining. This includes routine maintenance (plowing, sweeping, right-of-way work), preventative maintenance and reconstruction. The vast majority of the streets are asphalt, with a few segments being concrete and some alleys are gravel. Curb and gutter exist in some, but not all areas of the Town. Given the age of the Town, some of the streets have a base that would be considered substandard by today's design parameters.

Asset management is defined as:

"An ongoing process of maintaining, upgrading and operating physical assets cost effectively, based on a continuous physical inventory and condition assessment."

What this means in a simple term is that a municipality should take care of what they have: keep the good roads good for as long as possible.

The LTAP has published the "Approved Asset Management Plan" for local agencies in Indiana. This publication lays out a step by step process for local agencies to follow when developing their asset management plans. It is not intended to restrict local agencies from incorporating their own practices into the process, but rather as a guide for the development of a rational, comprehensive plan. The Town's plan is based on this recommended approach, supplemented by specific processes and procedures that are unique to this Community.

# Objectives and Measures

The objective of the asset management process is to document the condition of the Town's streets. It is impossible to effectively manage the Town's street assets without having an understanding of what streets are owned by the Town as well as what condition they are in. Having this data allows the council liaison to communicate the status of the street network with residents, staff and other elected officials. It is a vital first step in the asset management process.

**Appendix D** is a reprint of the PASER manual published by the Transportation Information Center at the University of Wisconsin-Madison. This document provides a general overview of the PASER rating system.

## Performance Goals and Expected Level of Service

The Town of Wheatfield's performance goals are as follows. Non curbed and curbed streets to have proper crown in pavement with adequate storm water drainage. Asphalt pavement can have some transverse cracking that can be treated with crack sealer. The streets that are patched and crack sealed the most are put on the list to be resurfaced. High travelled streets fall into the same list as all of the other streets.

## Rating System Utilized

There are many different pavement rating systems available for communities to use. Some are very simple, while others are more complex. Examples of these systems are the Distress Index, the Pavement Condition Index, the Pavement Quality Index, the Overall Condition Index and the PASER rating. PASER stands for **Pa**vement **S**urface **E**valuation and **R**ating. LTAP recommends using the PASER rating system, and this is what the Town has adopted.

The road system will be measured using PASER field techniques. It is a methodology adopted by the University of Wisconsin and widely used across the country. The PASER system uses visual inspection of roads to evaluate pavement surface conditions. The methodology involves identifying different types of pavement distress (raveling, rutting, cracks, etc.) and tying them back to a road's life expectancy. This results in a PASER rating of 10 to 1, with 10 being a newly constructed road and 1 being a failed road with loss of surface integrity.

# Objectives and Measures, Cont.

## Work Plan Process

The Town contracted its initial assessment to Abonmarche Consultants. PASER trained engineers developed a spreadsheet of all roads in the corporate limits and segmented the roads from intersection to intersection. Using the County GIS, each segment's length and width was determined and entered into the spreadsheet. Utilizing the PASER rating system, each segment was field assessed and a value generated by the spreadsheet. All streets were assessed and Table 1 included in Appendix A was developed for this report. In 2017 and 2018, McMahon Associates, Inc. was contracted to update the Asset Management Plan. At the time of the July 2018 update, FY 2017 had been completed and FY 2018 improvements were under construction. A full re-evaluation of every road segment was completed in July, 2018. Those segments which were under construction at the time of the update were rated based on their anticipated completed state.

## Monitoring Program and Plan

At the time of the initial plan development, it was indicated that the Town Staff would be trained to assess road networks for the future annual assessments. However, implementation of this plan has not yet taken place, and the Town has engaged McMahon Associates, Inc. to provide updates to the plan in 2017 & 2018. Moving forward, it is the Town's intent to update the plan every two years at the most, with an emphasis on attempting updates annually. In the future, the Town may utilize staff to complete the updates or continue to utilize consultant services to complete this service.

In an effort to document the plan alterations year over year, Appendix C has been added to this plan, which provides a tabular format of the changes made each time the plan is updated or revised.

## Drainage and Right-of-Way Conditions

During assessment, observed drainage conditions were noted on the spreadsheet. The Town has an active Public Works Department and actively cleans and maintains its stormwater infra-structure. The Town has stormwater conveyance systems with many streets having curb, gutter, inlets and catch basins. Town roads without in-road stormwater structures have side ditches and swales that the Public Works Staff maintains if the property owner cannot adequately sustain.

In December, 2016, the Town developed and implemented a Stormwater Master Plan through Indiana's OCRA Planning Grant program. This plan provides the community with a

# Objectives and Measures, Cont.

town-wide master plan of stormwater improvements to assist in the long term management of runoff, and in addition, aid in the longevity of their roadway system. The goal of the plan is to implement the suggested drainage improvements over many phases, and to coincide these improvements with annual local road projects.

The Town right-of-way is well established and in place. Town roads are in publically held recorded documents and stormwater drainage areas are centrally located on Town property. Previous flooding events have been mitigated by the Town departments in the past years and there are few known areas of major issues. Minor issues typically involve unclogging catch basin lids and removing debris from structures. The Public Works Staff actively maintains these public systems and staffing levels are comparable with the normal day to day operations witnessed.

## Status of Implemented Improvements

As of the writing of this update, the Town of Wheatfield pavement improvement projects for FY 2017 have been completed. The project entailed milling / resurfacing of 1.25 miles of local roads in the community, and crack sealing of an additional 1.0 miles. The FY 2018 projects were underway, and included new paving of approximately 0.3 miles of previously gravel roadway, new storm sewer trunk mains, sidewalk improvements and resurfacing of approximately 0.6 miles of Grove Street. The attached Pavement Assessment Inventory has been updated to reflect the post construction conditions of these road segments. The List of Proposed Treatments by Year for the Next Five Years has been updated to include proposed projects through FY 2023. The FY 2019 project scope has been adjusted to accommodate available local share participation based on funding availability. The Town of Wheatfield intends on applying for CCMG funds this fall.

# APPENDIX A

## Table 1 - Pavement Asset Inventory

Updated: July, 2018

McMAHON ENGINEERS ARCHITECTS

**Table 1 - Pavement Asset Inventory**

| Block Designation | Segment | Street Name | From | To | Length (mi) | Width (ft) | Surface Type | Rating | Year Rated | Classification |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| 157-164 | 182 | ALLEY ST. | CENTRAL ST. | HIGH ST. | 0.17 | 12 | ASPHALT | 9 | 2018 | LOCAL |
| 165-172 | 168 | BENTLEY ST. | MYERS ST. | MCNEIL ST. | 0.04 | 24 | ASPHALT | 7 | 2018 | LOCAL |
| 157-164 | 157 | BROADWAY ST. | END | GROVE ST. | 0.06 | 15 | ASPHALT | 2 | 2018 | LOCAL |
| 157-164 | 158 | BROADWAY ST. | GROVE ST. | HIGH ST. | 0.08 | 20 | ASPHALT | 8 | 2018 | LOCAL |
| 110-115 | 115A | CEDAR ST. | E . HOEHN ST. | E. ROBBINS | 0.07 | 20 | ASPHALT | 3 | 2018 | LOCAL |
| 116-124 | 116 | CENTER ST. | E ROBBINS ST. | JACKSON ST. | 0.19 | 20 | ASPHALT | 7 | 2018 | LOCAL |
| 116-124 | 117 | CENTER ST. | JACKSON ST. | SOUTH ST. | 0.06 | 20 | ASPHALT | 7 | 2018 | LOCAL |
| 116-124 | 118 | CENTER ST. | SOUTH ST. | HIGH ST. | 0.07 | 21 | ASPHALT | 7 | 2018 | LOCAL |
| 116-124 | 119 | CENTER ST. | HIGH ST. | GROVE ST. | 0.07 | 21 | ASPHALT | 7 | 2018 | LOCAL |
| 116-124 | 120 | CENTER ST. | GROVE ST. | END | 0.07 | 21 | ASPHALT | 3 | 2018 | LOCAL |
| 165-172 | 165 | CENTRAL AVE. | BEND | BENTLEY ST. | 0.12 | 24 | ASPHALT | 6 | 2018 | LOCAL |
| 165-172 | 166 | CENTRAL AVE. | BENTLEY ST. | MEADOW LN. | 0.16 | 24 | ASPHALT | 8 | 2018 | LOCAL |
| 157-164 | 162 | CENTRAL ST. | CONCORD ST. | ALLEY | 0.03 | 15-24 | ASPHALT | 6 | 2018 | LOCAL |
| 157-164 | 163 | CENTRAL ST. | ALLEY | BEND | 0.02 | 20-24 | ASPHALT | 7 | 2018 | LOCAL |
| 157-164 | 164 | CENTRAL ST. | BEND | BEND | 0.05 | 20 | ASPHALT | 7 | 2018 | LOCAL |
| 157-164 | 159 | CONCORD ST. | END | GROVE ST. | 0.08 | 14 | ASPHALT | 2 | 2018 | LOCAL |
| 157-164 | 160 | CONCORD ST. | GROVE ST. | HIGH ST. | 0.06 | 21 | ASPHALT | 7 | 2018 | LOCAL |
| 157-164 | 161 | CONCORD ST. | HIGH ST. | CENTRAL ST. | 0.08 | 20 | ASPHALT | 7 | 2018 | LOCAL |
| 110-115 | 113 | E HOEHN ST. | S BEIRMA ST. | S MARSHALL ST. | 0.07 | 19-20 | ASPHALT | 3 | 2018 | LOCAL |
| 110-115 | 114 | E HOEHN ST. | S MARSHALL ST. | CEDAR ST. | 0.05 | 19-20 | ASPHALT | 3 | 2018 | LOCAL |
| 110-115 | 115 | E HOEHN ST. | CEDAR ST. | CUL-DE-SAC | 0.09 | 24 | ASPHALT | 6 | 2018 | LOCAL |
| 100-109 | 108 | E PINE ST | END | S MARSHALL ST | 0.05 | 14 | ASPHALT | 2 | 2018 | LOCAL |
| 100-109 | 109 | E PINE ST | S MARSHALL | CUL-DE-SAC | 0.14 | 14-23 | ASPHALT | 2-6 | 2018 | LOCAL |
| 110-115 | 112 | E TRETT ST. | S MARSHALL ST. | CUL-DE-SAC | 0.14 | 14-24 | ASPHALT | 2-6 | 2018 | LOCAL |
| 116-124 | 121 | GRACE ST. | END | GROVE ST. | 0.07 | 19 | ASPHALT | 5 | 2018 | LOCAL |
| 116-124 | 122 | GRACE ST. | GROVE ST. | HIGH ST. | 0.07 | 19 | ASPHALT | 8 | 2018 | LOCAL |
| 116-124 | 123 | GRACE ST. | HIGH ST. | SOUTH ST. | 0.07 | 20 | ASPHALT | 6 | 2018 | LOCAL |
| 116-124 | 124 | GRACE ST. | SOUTH ST. | JACKSON ST. | 0.06 | 18 | ASPHALT | 3 | 2018 | LOCAL |
| 173-179 | 176 | GRAHAM ST. | SOUTH ST. | HIGH ST. | 0.08 | 20 | ASPHALT | 8 | 2018 | LOCAL |
| 173-179 | 177 | GRAHAM ST. | HIGH ST. | GROVE ST. | 0.07 | 20 | ASPHALT | 3 | 2018 | LOCAL |
| 173-179 | 178 | GRAHAM ST. | GROVE ST. | RR | 0.07 | 20 | ASPHALT | 4 | 2018 | LOCAL |
| 173-179 | 173 | GRAHAM ST. | ROBBINS ST. | OAKWOOD DR. | 0.13 | 20 | ASPHALT | 6 | 2018 | LOCAL |
| 173-179 | 174 | GRAHAM ST. | OAKWOOD DR. | JACKSON ST. | 0.07 | 20 | ASPHALT | 6 | 2018 | LOCAL |
| 173-179 | 175 | GRAHAM ST. | JACKSON ST. | SOUTH ST. | 0.06 | 20 | ASPHALT | 6 | 2018 | LOCAL |
| 135-146 | 141 | GROVE ST. | HILLARD ST. | GRAHAM ST. | 0.25 | 20 | ASPHALT | 3 | 2018 | LOCAL |
| 135-146 | 142 | GROVE ST. | GRAHAM ST. | GRACE ST. | 0.09 | 20 | ASPHALT | 9 | 2018 | LOCAL |
| 135-146 | 142 | GROVE ST. | GRACE ST. | CENTER ST. | 0.07 | 20 | ASPHALT | 9 | 2018 | LOCAL |
| 135-146 | 144 | GROVE ST. | CENTER ST. | BIERMA ST. | 0.09 | 54 | ASPHALT | 9 | 2018 | LOCAL |
| 135-146 | 145 | GROVE ST. | BIERMA ST. | CONCORD ST. | 0.06 | 36 | ASPHALT | 9 | 2018 | LOCAL |
| 135-146 | 146 | GROVE ST. | CONCORD ST. | BROADWAY ST. | 0.07 | 20 | ASPHALT | 9 | 2018 | LOCAL |
| 147-156 | 147 | GROVE ST. | BROADWAY ST. | WOLF ST. | 0.07 | 20 | ASPHALT | 9 | 2018 | LOCAL |
| 147-156 | 148 | GROVE ST. | WOLF ST. | PEARL ST. | 0.07 | 20 | ASPHALT | 9 | 2018 | LOCAL |
| 147-156 | 149 | GROVE ST. | PEARL ST. | MEADOW LN. | 0.07 | 20-24 | ASPHALT | 7-9 | 2018 | LOCAL |
| 135-146 | 135 | HIGH ST. | BROADWAY ST. | CONCORD ST. | 0.07 | 20 | ASPHALT | 8 | 2018 | LOCAL |
| 135-146 | 136 | HIGH ST. | CONCORD ST. | BIERMA ST. | 0.07 | 31-33 | ASPHALT | 8 | 2018 | LOCAL |

Updated: July, 2018

McMAHON ENGINEERS ARCHITECTS

| Table 1 - Pavement Asset Inventory | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Block Designation | Segment | Street Name | From | To | Length (mi) | Width (ft) | Surface Type | Rating | Year Rated | Classification |
| 135-146 | 137 | HIGH ST. | BIERMA ST. | CENTER ST. | 0.09 | 22-32 | ASPHALT | 6 | 2018 | LOCAL |
| 125-134 | 132 | HIGH ST | MEADOW LN. | PEARL ST. | 0.1 | 24 | ASPHALT | 7 | 2018 | LOCAL |
| 125-134 | 133 | HIGH ST | PEARL ST. | WOLF ST. | 0.07 | 20 | ASPHALT | 8 | 2018 | LOCAL |
| 125-134 | 134 | HIGH ST | WOLF ST. | BROADWAY ST. | 0.07 | 20 | ASPHALT | 8 | 2018 | LOCAL |
| 135-146 | 138 | HIGH ST. | CENTER ST. | GRACE ST. | 0.07 | 20-23 | ASPHALT | 8 | 2018 | LOCAL |
| 135-146 | 139 | HIGH ST. | GRACE ST. | GRAHAM ST. | 0.09 | 20 | ASPHALT | 8 | 2018 | LOCAL |
| 135-146 | 140 | HIGH ST. | GRAHAM ST. | END | 0.14 | 15 | ASPHALT | 3 | 2018 | LOCAL |
| 125-134 | 125 | JACKSON ST. | BIERMA ST. | CENTER ST. | 0.08 | 20 | ASPHALT | 7 | 2018 | LOCAL |
| 125-134 | 126 | JACKSON ST. | GRACE ST. | GRAHAM ST. | 0.09 | 18 | ASPHALT | 3 | 2018 | LOCAL |
| 173-179 | 173 | MCNEIL ST. | BENTLEY ST. | MYERS ST. | 0.16 | 19 | ASPHALT | 7 | 2018 | LOCAL |
| 147-156 | 150 | MEADOW LN. | GROVE ST. | HIGH ST. | 0.07 | 24 | ASPHALT | 7 | 2018 | LOCAL |
| 147-156 | 151 | MEADOW LN. | HIGH ST. | CENTRAL AVE. | 0.07 | 24 | ASPHALT | 7 | 2018 | LOCAL |
| 147-156 | 152 | MEADOW LN. | CENTRAL AVE. | END | 0.05 | 24 | ASPHALT | 7 | 2018 | LOCAL |
| 165-172 | 172 | MYERS ST. | BEND | WESTGATE DR. | 0.06 | 24 | ASPHALT | 7 | 2018 | LOCAL |
| 165-172 | 169 | MYERS ST. | BENTLEY ST. | BEND | 0.08 | 24 | ASPHALT | 7 | 2018 | LOCAL |
| 165-172 | 170 | MYERS ST. | BEND | MCNEIL ST. | 0.1 | 24 | ASPHALT | 7 | 2018 | LOCAL |
| 165-172 | 171 | MYERS ST. | MCNEIL ST. | BEND | 0.04 | 24 | ASPHALT | 7 | 2018 | LOCAL |
| 100-109 | 100 | N BIERMA ST. | NORTH CITY LIMITS | E PENN ST. | 0.15 | 18 | ASPHALT | 7 | 2018 | LOCAL |
| 100-109 | 101 | N BIERMA ST. | E PENN ST. | GROVE ST. | 0.09 | 20-30 | ASPHALT | 4 | 2018 | LOCAL |
| 100-109 | 102 | N BIERMA ST. | GROVE ST. | HIGH ST. | 0.07 | 37 | ASPHALT | 4 | 2018 | LCOAL |
| 100-109 | 103 | N BIERMA ST. | HIGH ST. | SOUTH ST. | 0.07 | 21 | ASPHALT | 3 | 2018 | LOCAL |
| 100-109 | 104 | N BIERMA ST. | SOUTH ST. | JACKSON ST. | 0.07 | 21 | ASPHALT | 3 | 2018 | LOCAL |
| 100-109 | 105 | N BIERMA ST. | JACKSON ST. | ROBBINS ST. | 0.19 | 21 | ASPHALT | 6 | 2018 | LOCAL |
| 100-109 | 106 | N BIERMA ST. | ROBBINS ST. | HOEHN ST. | 0.07 | 21 | ASPHALT | 4 | 2018 | LOCAL |
| 100-109 | 107 | N BIERMA ST. | HOEHN ST. | CITY LIMITS | 0.13 | 20 | ASPHALT | 4 | 2018 | LOCAL |
| 173-179 | 179 | OAKWOOD DR. | GRAHAM ST. | HILLARD ST. | 0.25 | 16 | ASPHALT | 6 | 2018 | LOCAL |
| 147-156 | 153 | PEARL ST. | END | GROVE ST. | 0.06 | 18 | ASPHALT | 8 | 2018 | LOCAL |
| 147-156 | 154 | PEARL ST. | GROVE ST. | HIGH ST. | 0.08 | 16 | ASPHALT | 8 | 2018 | LOCAL |
| 180-181 | 180 | PENN ST. | BIERMA ST. | 524 PENN ST. | 0.37 | 15 | ASPHALT | 9 | 2018 | LOCAL |
| 180-181 | 181 | PENN ST. | SIDE ST. | HILLARD ST. | 0.13 | 18 | ASPHALT | 8 | 2018 | LOCAL |
| 110-115 | 110 | S MARSHALL ST. | E PINE ST. | S TRETT ST. | 0.07 | 20 | ASPHALT | 2 | 2018 | LOCAL |
| 110-115 | 111 | S MARSHALL ST. | S TRETT ST. | E HOEHN ST. | 0.08 | 23 | ASPHALT | 8 | 2018 | LOCAL |
| 125-134 | 127 | SOUTH ST. | HILLARD ST. | 396 SOUTH ST. | 0.14 | 18 | ASPHALT | 8 | 2018 | LOCAL |
| 125-134 | 128 | SOUTH ST. | 396 SOUTH ST. | GRAHAM ST. | 0.11 | 20 | ASPHALT | 8 | 2018 | LOCAL |
| 125-134 | 129 | SOUTH ST. | GRAHAM ST. | GRACE ST. | 0.09 | 20 | ASPHALT | 6 | 2018 | LOCAL |
| 125-134 | 130 | SOUTH ST. | GRACE ST. | CENTER ST. | 0.07 | 21 | ASPHALT | 6 | 2018 | LOCAL |
| 125-134 | 131 | SOUTH ST. | CENTER ST. | BIERMA ST. | 0.08 | 21 | ASPHALT | 7 | 2018 | LOCAL |
| 147-156 | 155 | WOLF ST. | HIGH ST. | GROVE ST. | 0.08 | 19 | ASPHALT | 6 | 2018 | LOCAL |
| 147-156 | 156 | WOLF ST. | GROVE ST. | E ALEA ATREET | 0.06 | 19 | ASPHALT | 2 | 2018 | LOCAL |
| SUM | | | | | 7.69 | | | | | |

# APPENDIX B

## Table 2 - Pavement Treatment Summary
## 5-Year Plan

| Table 2 - Pavement Treatment Summary - 5 Year Plan | | | | | |
|---|---|---|---|---|---|
| **Fiscal Year** | **Rating** | **Treatment Used** | **Estimated Cost Per Mile** | **Estimated Miles** | **Estimated Cost** |
| 2019 | 7,6 | Crack Sealing | $ 15,000 | | $ - |
| 2019 | 6,5 | Slurry Sealing | $ 37,500 | | $ - |
| 2019 | 5 | Microsurfacing | $ 55,000 | | $ - |
| 2019 | 5,4 | Mill and Fill | $ 165,000 | | $ - |
| 2019 | 3,2 | Rehabilitation | $ 340,000 | 0.25 | $ 85,000.00 |
| 2019 | 1 | Reconstruction | $ 910,000 | | $ - |
| **Total** | | | | | $ 85,000.00 |
| 2020 | 7,6 | Crack Sealing | $ 15,450 | 0.50 | $ 7,725.00 |
| 2020 | 6,5 | Slurry Sealing | $ 38,625 | | $ - |
| 2020 | 5 | Microsurfacing | $ 56,650 | 0.25 | $ 14,162.50 |
| 2020 | 5,4 | Mill and Fill | $ 169,950 | | $ - |
| 2020 | 3,2 | Rehabilitation | $ 350,200 | 0.30 | $ 105,060.00 |
| 2020 | 1 | Reconstruction | $ 937,300 | | $ - |
| **Total** | | | | | $ 126,947.50 |
| 2021 | 7,6 | Crack Sealing | $ 15,914 | 1.00 | $ 15,914.00 |
| 2021 | 6,5 | Slurry Sealing | $ 39,784 | | $ - |
| 2021 | 5 | Microsurfacing | $ 58,350 | 0.25 | $ 14,587.50 |
| 2021 | 5,4 | Mill and Fill | $ 175,049 | | $ - |
| 2021 | 3,2 | Rehabilitation | $ 360,706 | 0.46 | $ 165,924.76 |
| 2021 | 1 | Reconstruction | $ 965,419 | | $ - |
| **Total** | | | | | $ 196,426.26 |
| 2022 | 7,6 | Crack Sealing | $ 16,391 | 0.75 | $ 12,293.25 |
| 2022 | 6,5 | Slurry Sealing | $ 40,978 | | $ - |
| 2022 | 5 | Microsurfacing | $ 60,101 | | $ - |
| 2022 | 5,4 | Mill and Fill | $ 180,300 | | $ - |
| 2022 | 3,2 | Rehabilitation | $ 371,527 | 0.51 | $ 189,478.77 |
| 2022 | 1 | Reconstruction | $ 994,382 | | $ - |
| **Total** | | | | | $ 201,772.02 |
| 2023 | 7,6 | Crack Sealing | $ 16,883 | 1.50 | $ 25,324.50 |
| 2023 | 6,5 | Slurry Sealing | $ 42,207 | | $ - |
| 2023 | 5 | Microsurfacing | $ 61,904 | 0.60 | $ 37,142.40 |
| 2023 | 5,4 | Mill and Fill | $ 185,709 | 0.27 | $ 50,141.43 |
| 2023 | 3,2 | Rehabilitation | $ 382,673 | 0.18 | $ 68,881.14 |
| 2023 | 1 | Reconstruction | $ 1,024,213 | | $ - |
| **Total** | | | | | $ 181,489.47 |

* Accounts for a 3% Inflation Rate per Year

Updated: July 2018

# APPENDIX C

## Asset Management Plan
## Revision / Update Table

## REVISION / UPDATE TABLE
## Asset Management Plan - Town of Wheatfield

| REVISION / UPDATE NUMBER | DATE | AUTHOR | DESCRIPTION |
|---|---|---|---|
| 0 | September, 2016 | Abonmarche Consultants | Initial plan development |
| 1 | July, 2017 | McMahon Associates, Inc. | Update narrative and Appendices A & B to reflect FY 2017 projects |
| 2 | July, 2018 | McMahon Associates, Inc. | Complete full road assessment, update narrative, add FY 2018 projects |

# APPENDIX D
PASER Manual

*Pavement Surface Evaluation and Rating*

# PASER Manual

## Asphalt Roads


Transportation Information Center
University of Wisconsin–Madison

# *Contents*



This manual is intended to assist local officials in understanding and rating the surface condition of asphalt pavement. It describes types of defects and provides a simple system to visually rate pavement condition. The rating procedure can be used as condition data for the Wisconsin DOT local road inventory and as part of a computerized pavement management system like PASERWARE.

The PASER system described here and in other T.I.C. publications is based in part on a roadway management system originally developed by Phil Scherer, transportation planner, Northwest Wisconsin Regional Planning Commission.


Produced by the T.I.C. with support from the Federal Highway Administration, the Wisconsin Department of Transportation, and the University of Wisconsin-Extension. The T.I.C., part of the nationwide Local Technical Assistance Program (LTAP), is a Center of the College of Engineering, Department of Engineering Professional Development, University of Wisconsin–Madison.





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Printed on recycled paper.

*Pavement Surface Evaluation and Rating*

PASER Manual

# Asphalt Roads

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Susan Kummer, Artifax, *designer*

*Transportation Information Center*
University of Wisconsin–Madison

*Pavement Surface Evaluation and Rating*

# Asphalt PASER Manual

A local highway agency's major goal is to use public funds to provide a comfortable, safe and economical road surface—no simple task. It requires balancing priorities and making difficult decisions in order to manage pavements. Local rural and small city pavements are often managed informally, based on the staff's judgment and experience. While this process is both important and functional, using a slightly more formalized technique can make it easier to manage pavements effectively.

Experience has shown that there are three especially useful steps in managing local roads:

1. Inventory all local roads and streets.
2. Periodically evaluate the condition of all pavements.
3. Use the condition evaluations to set priorities for projects and select alternative treatments.

A comprehensive pavement management system involves collecting data and assessing several road characteristics: roughness (ride), surface distress (condition), surface skid characteristics, and structure (pavement strength and deflection). Planners can combine this condition data with economic analysis to develop short-range and long-range plans for a variety of budget levels. However, many local agencies lack the resources for such a full-scale system.

Since surface condition is the most vital element in any pavement management system, local agencies can use the simplified rating system presented in this ***Asphalt PASER Manual*** to evaluate their roads. The PASER ratings combined with other inventory data (width, length, shoulder, pavement type, etc.) from the WisDOT local roads inventory (WISLR) can be very helpful in planning future budgets and priorities.

WISLR inventory information and PASER ratings can be used in a computerized pavement management system, PASERWARE, developed by the T.I.C and WisDOT. Local officials can use PASERWARE to evaluate whether their annual road budgets are adequate to maintain or improve current road conditions and to select the most cost-effective strategies and priorities for annual projects.

PASER Manuals for gravel, concrete, and other road surfaces, with compatible rating systems are also available (page 29). Together they make a comprehensive condition rating method for all road types. PASER ratings are accepted for WISLR condition data.

## *Asphalt pavement distress*

PASER uses visual inspection to evaluate pavement surface conditions. The key to a useful evaluation is identifying different types of pavement distress and linking them to a cause. Understanding the cause for current conditions is extremely important in selecting an appropriate maintenance or rehabilitation technique.

There are four major categories of common asphalt pavement surface distress:

**Surface defects**
Raveling, flushing, polishing.

**Surface deformation**
Rutting, distortion—rippling and shoving, settling, frost heave.

**Cracks**
Transverse, reflection, slippage, longitudinal, block, and alligator cracks.

**Patches and potholes**

Deterioration has two general causes: environmental due to weathering and aging, and structural caused by repeated traffic loadings.

Obviously, most pavement deterioration results from both environmental and structural causes. However, it is important to try to distinguish between the two in order to select the most effective rehabilitation techniques.

The rate at which pavement deteriorates depends on its environment, traffic loading conditions, original construction quality, and interim maintenance procedures. Poor quality materials or poor construction procedures can significantly reduce the life of a pavement. As a result, two pavements constructed at the same time may have significantly different lives, or certain portions of a pavement may deteriorate more rapidly than others. On the other hand, timely and effective maintenance can extend a pavement's life. Crack sealing and seal coating can reduce the effect of moisture in aging of asphalt pavement.

With all of these variables, it is easy to see why pavements deteriorate at various rates and why we find them in various stages of disrepair. Recognizing defects and understanding their causes helps us rate pavement condition and select cost-effective repairs. The pavement defects shown on the following pages provide a background for this process.

Periodic inspection is necessary to provide current and useful evaluation data. It is recommended that PASER ratings be updated every two years, and an annual update is even better.

## SURFACE DEFECTS

### *Raveling*

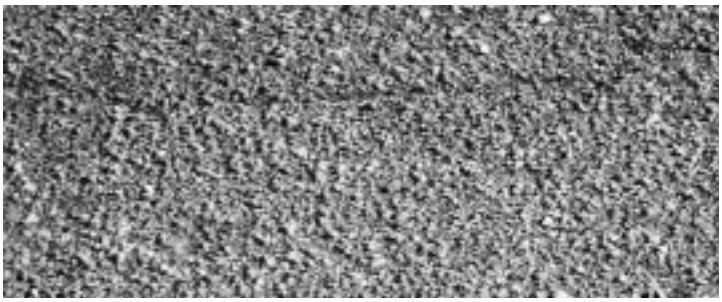
Raveling is progressive loss of pavement material from the surface downward, caused by: stripping of the bituminous film from the aggregate, asphalt hardening due to aging, poor compaction especially in cold weather construction, or insufficient asphalt content. Slight to moderate raveling has loss of fines. Severe raveling has loss of coarse aggregate. Raveling in the wheelpaths can be accelerated by traffic. Protect pavement surfaces from the environment with a sealcoat or a thin overlay if additional strength is required.

### *Flushing*

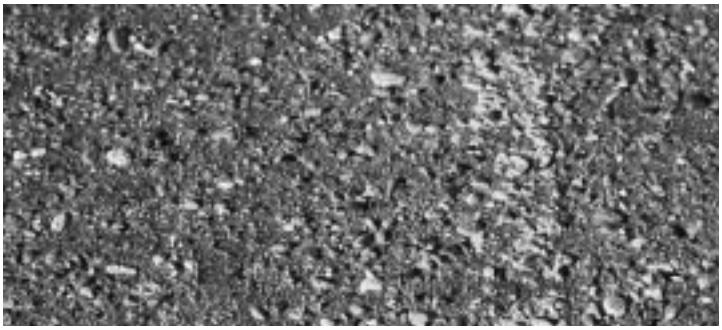
Flushing is excess asphalt on the surface caused by a poor initial asphalt mix design or by paving or sealcoating over a flushed surface. Repair by blotting with sand or by overlaying with properly designed asphalt mix.

### *Polishing*

Polishing is a smooth slippery surface caused by traffic wearing off sharp edges of aggregates. Repair with sealcoat or thin bituminous overlay using skid-resistant aggregate.



◄ **Slight raveling. Small aggregate particles have worn away exposing tops of large aggregate.**

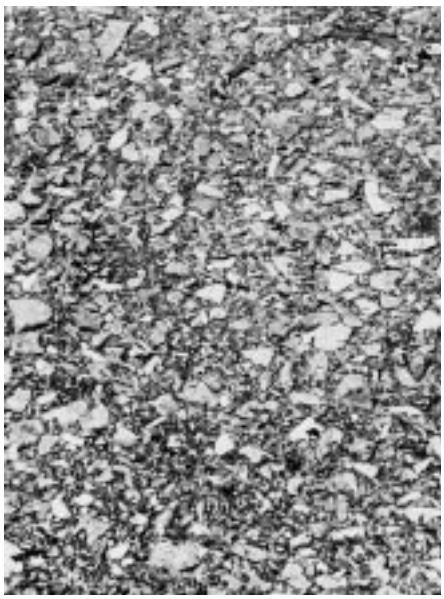


◄ **Moderate to severe raveling. Erosion further exposes large aggregate.**

◄ **Severe raveling and loss of surface material.**

**Polished, worn aggregate needs repair. ▼**

► **Flushing. Dark patches show where asphalt has worked to surface.**



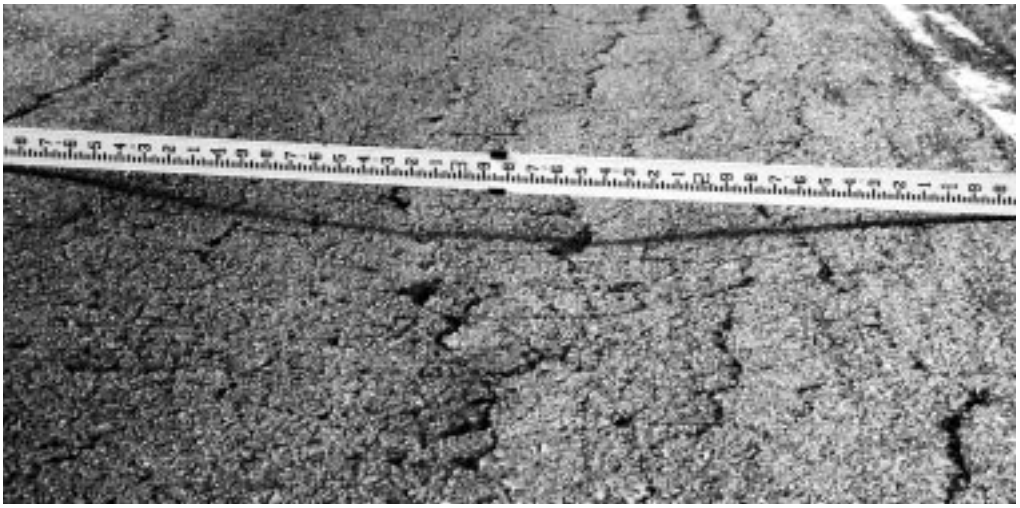
## SURFACE DEFORMATION

### *Rutting*

Rutting is displacement of material, creating channels in wheelpaths. It is caused by traffic compaction or displacement of unstable material. Severe rutting (over 2") may be caused by base or subgrade consolidation. Repair minor rutting with overlays. Severe rutting requires milling the old surface or reconstructing the roadbed before resurfacing.

◄ **Even slight rutting is evident after a rain.**

◄ **Severe rutting over 2" caused by poor mix design.**



◄ **Severe rutting caused by poor base or subgrade.**

## *Distortion*

Shoving or rippling is surfacing material displaced crossways to the direction of traffic. It can develop into washboarding when the asphalt mixture is unstable because of poor quality aggregate or improper mix design. Repair by milling smooth and overlaying with stable asphalt mix.

Other pavement distortions may be caused by settling, frost heave, etc. Patching may provide temporary repair. Permanent correction usually involves removal of unsuitable subgrade material and reconstruction.

▼ **Heavy traffic has shoved pavement into washboard ripples and bumps.**

► **Severe settling from utility trench.**

► **Frost heave damage from spring break-up.**

▼ **Widely spaced, well-sealed cracks.**

## CRACKS

### *Transverse cracks*

A crack at approximately right angles to the center line is a transverse crack. They are often regularly spaced. The cause is movement due to temperature changes and hardening of the asphalt with aging.

Transverse cracks will initially be widely spaced (over 50'). Additional cracking will occur with aging until they are closely spaced (within several feet). These usually begin as hairline or very narrow cracks; with aging they widen. If not properly sealed and maintained, secondary or multiple cracks develop parallel to the initial crack. The crack edges can further deteriorate by raveling and eroding the adjacent pavement.

Prevent water intrusion and damage by sealing cracks which are more than ¼" wide.

◄ **Sealed cracks, a few feet apart.**

▲ **Tight cracks less than ¼" in width.**

▲ **Open crack – ½" or more in width.**

▲ **Water enters unsealed cracks softening pavement and causing secondary cracks.**

▲ **Pavement ravels and erodes along open cracks causing deterioration.**

## *Reflection cracks*

Cracks in overlays reflect the crack pattern in the pavement underneath. They are difficult to prevent and correct. Thick overlays or reconstruction is usually required.

► **Concrete joints reflected through bituminous overlay.**

## *Slippage cracks*

Crescent or rounded cracks in the direction of traffic, caused by slippage between an overlay and an underlying pavement. Slippage is most likely to occur at intersections where traffic is stopping and starting. Repair by removing the top surface and resurfacing using a tack coat.

► **Crescent-shaped cracks characteristic of slippage.**

► **Loss of bond between pavement layers allows traffic to break loose pieces of surface.**

Centerline crack (still tight). ►

Edge cracking from weakened subbase and traffic loads. ▼

## *Longitudinal cracks*

Cracks running in the direction of traffic are longitudinal cracks. Center line or lane cracks are caused by inadequate bonding during construction or reflect cracks in underlying pavement. Longitudinal cracks in the wheel path indicate fatigue failure from heavy vehicle loads. Cracks within one foot of the edge are caused by insufficient shoulder support, poor drainage, or frost action. Cracks usually start as hairline or vary narrow and widen and erode with age. Without crack filling, they can ravel, develop multiple cracks, and become wide enough to require patching.

Filling and sealing cracks will reduce moisture penetration and prevent further subgrade weakening. Multiple longitudinal cracks in the wheel path or pavement edge indicate a need for strengthening with an overlay or reconstruction.

► First stage of wheelpath cracking caused by heavy traffic loads.

Load-related cracks in wheel path plus centerline cracking. ▼

Multiple open cracks at center line, wheelpaths and lane center. ▼

## *Block cracks*

Block cracking is interconnected cracks forming large blocks. Cracks usually intersect at nearly right angles. Blocks may range from one foot to approximately 10′ or more across. The closer spacing indicates more advanced aging caused by shrinking and hardening of the asphalt over time. Repair with sealcoating during early stages to reduce weathering of the asphalt. Overlay or reconstruction required in the advanced stages.

► **Large blocks, approximately 10′ across.**

► **Intermediate-size block cracking, 1′-5′ across with open cracks.**

▲ **Extensive block cracking in an irregular pattern.**

► **Severe block cracking – 1′ or smaller blocks. Tight cracks with no raveling.**

## *Alligator cracks*

Interconnected cracks forming small pieces ranging in size from about 1" to 6". This is caused by failure of the surfacing due to traffic loading (fatigue) and very often also due to inadequate base or subgrade support. Repair by excavating localized areas and replacing base and surface. Large areas require reconstruction. Improvements in drainage may often be required.

◄
**Alligator crack pattern. Tight cracks and one patch.**

◄
**Characteristic "chicken wire" crack pattern shows smaller pavement pieces and patching.**

◄
**Open raveled alligator cracking with settlement along lane edge most likely due to very soft subgrade.**

## PATCHES AND POTHOLES

### *Patches*

Original surface repaired with new asphalt patch material. This indicates a pavement defect or utility excavation which has been repaired. Patches with cracking, settlement or distortions indicate underlying causes still remain. Recycling or reconstruction are required when extensive patching shows distress.

► **Typical repair of utility excavation. Patch in fair to good condition.**

► **Edge wedging. Pavement edges strengthened with wedges of asphalt. Patch is in very good condition.**

► **Extensive patching in very poor condition.**

## *Potholes*

Holes and loss of pavement material caused by traffic loading, fatigue and inadequate strength. Often combined with poor drainage. Repair by excavating or rebuilding localized potholes. Reconstruction required for extensive defects.

◄
**Small pothole where top course has broken away.**

◄
**Multiple potholes show pavement failure, probably due to poor subgrade soils, frost heave, and bad drainage.**

◄
**Large, isolated pothole, extends through base. Note adjacent alligator cracks which commonly deteriorate into potholes.**

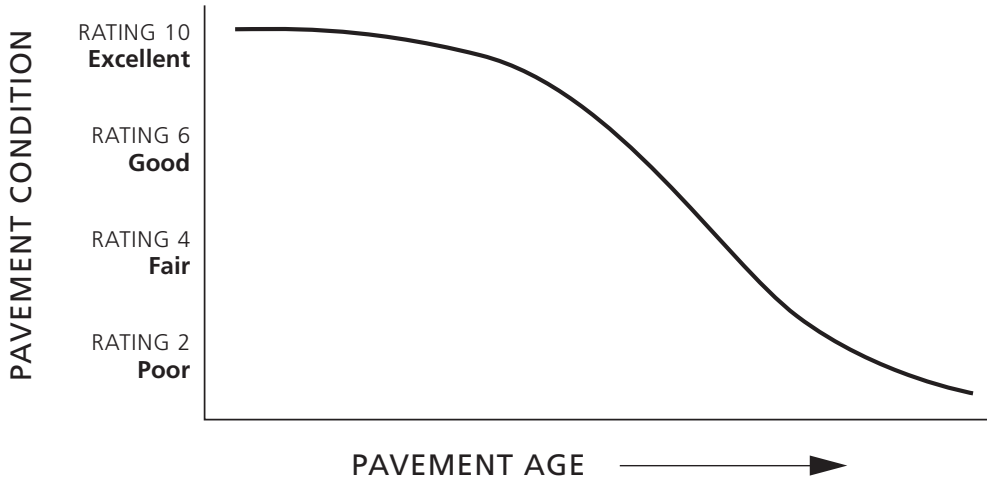
# Rating pavement surface condition

With an understanding of surface distress, you can evaluate and rate asphalt pavement surfaces. The rating scale ranges from **10–excellent** condition to **1–failed**. Most pavements will deteriorate through the phases listed in the rating scale. The time it takes to go from excellent condition (10) to complete failure (1) depends largely on the quality of the original construction and the amount of heavy traffic loading.

Once significant deterioration begins, it is common to see pavement decline rapidly. This is usually due to a combination of loading and the effects of additional moisture. As a pavement ages and additional cracking develops, more moisture can enter the pavement and accelerate the rate of deterioration.

Look at the photographs in this section to become familiar with the descriptions of the individual rating categories. To evaluate an individual pavement segment, first determine its general condition. Is it relatively new, toward the top end of the scale? In very poor condition and at the bottom of the scale? Or somewhere in between? Next, think generally about the appropriate maintenance method. Use the rating categories outlined below.

Finally, review the individual pavement distress and select the appropriate surface rating. Individual pavements will ***not*** have all of the types of distress listed for any particular rating. They may have only one or two types.




In addition to indicating the surface condition of a road, a given rating also includes a recommendation for needed maintenance or repair. This feature of the rating system facilitates its use and enhances its value as a tool in ongoing road maintenance.

**RATINGS ARE RELATED TO NEEDED MAINTENANCE OR REPAIR**

| | |
|---|---|
| **Rating 9 & 10** | No maintenance required |
| **Rating 8** | Little or no maintenance |
| **Rating 7** | Routine maintenance, cracksealing and minor patching |
| **Rating 5 & 6** | Preservative treatments (sealcoating) |
| **Rating 3 & 4** | Structural improvement and leveling (overlay or recycling) |
| **Rating 1 & 2** | Reconstruction |

## Rating system

| *Surface rating* | *Visible distress** | *General condition/ treatment measures* |
|---|---|---|
| **10 Excellent** | None. | New construction. |
| **9 Excellent** | None. | Recent overlay. Like new. |
| **8 Very Good** | No longitudinal cracks except reflection of paving joints. Occasional transverse cracks, widely spaced (40′ or greater). All cracks sealed or tight (open less than ¼″). | Recent sealcoat or new cold mix. Little or no maintenance required. |
| **7 Good** | Very slight or no raveling, surface shows some traffic wear. Longitudinal cracks (open ¼″) due to reflection or paving joints. Transverse cracks (open ¼″) spaced 10′ or more apart, little or slight crack raveling. No patching or very few patches in excellent condition. | First signs of aging. Maintain with routine crack filling. |
| **6 Good** | Slight raveling (loss of fines) and traffic wear. Longitudinal cracks (open ¼″–½″), some spaced less than 10′. First sign of block cracking. Sight to moderate flushing or polishing. Occasional patching in good condition. | Shows signs of aging. Sound structural condition. Could extend life with sealcoat. |
| **5 Fair** | Moderate to severe raveling (loss of fine and coarse aggregate). Longitudinal and transverse cracks (open ½″) show first signs of slight raveling and secondary cracks. First signs of longitudinal cracks near pavement edge. Block cracking up to 50% of surface. Extensive to severe flushing or polishing. Some patching or edge wedging in good condition. | Surface aging. Sound structural condition. Needs sealcoat or thin non-structural overlay (less than 2″) |
| **4 Fair** | Severe surface raveling. Multiple longitudinal and transverse cracking with slight raveling. Longitudinal cracking in wheel path. Block cracking (over 50% of surface). Patching in fair condition. Slight rutting or distortions (½″ deep or less). | Significant aging and first signs of need for strengthening. Would benefit from a structural overlay (2″ or more). |
| **3 Poor** | Closely spaced longitudinal and transverse cracks often showing raveling and crack erosion. Severe block cracking. Some alligator cracking (less than 25% of surface). Patches in fair to poor condition. Moderate rutting or distortion (1″ or 2″ deep). Occasional potholes. | Needs patching and repair prior to major overlay. Milling and removal of deterioration extends the life of overlay. |
| **2 Very Poor** | Alligator cracking (over 25% of surface). Severe distortions (over 2″ deep) Extensive patching in poor condition. Potholes. | Severe deterioration. Needs reconstruction with extensive base repair. Pulverization of old pavement is effective. |
| **1 Failed** | Severe distress with extensive loss of surface integrity. | Failed. Needs total reconstruction. |

** Individual pavements will not have all of the types of distress listed for any particular rating. They may have only one or two types.*

## RATING 10 & 9

**EXCELLENT —**
**No maintenance required**

Newly constructed or recently overlaid roads are in excellent condition and require no maintenance.

► **RATING 10**
**New construction.**

► **RATING 9**
**Recent overlay, rural.**

► **RATING 9**
**Recent overlay, urban.**

## RATING 8

**VERY GOOD —**
**Little or no maintenance required**

This category includes roads which have been recently sealcoated or overlaid with new cold mix. It also includes recently constructed or overlaid roads which may show longitudinal or transverse cracks. All cracks are tight or sealed.

◄ **Recent chip seal.**

◄ **Recent slurry seal.**

▲ **New cold mix surface.**

▼ **Widely spaced, sealed cracks.**

## RATING 7

**GOOD —**
**Routine sealing recommended**

Roads show first signs of aging, and they may have very slight raveling. Any longitudinal cracks are along paving joint. Transverse cracks may be approximately 10′ or more apart. All cracks are ¼″ or less, with little or no crack erosion. Few if any patches, all in very good condition. Maintain a crack sealing program.

► **Tight and sealed transverse and longitudinal cracks. Maintain crack sealing program.**

► **Tight and sealed transverse and longitudinal cracks.**

► **Transverse cracks about 10′ or more apart. Maintain crack sealing program.**

## RATING 6

**GOOD —**
**Consider preservative treatment**

Roads are in sound structural condition but show definite signs of aging. Seal-coating could extend their useful life. There may be slight surface raveling. Transverse cracks can be frequent, less than 10′ apart. Cracks may be 1/4–1/2″ and sealed or open. Pavement is generally sound adjacent to cracks. First signs of block cracking may be evident. May have slight or moderate bleeding or polishing. Patches are in good condition.

◄ **Slight surface raveling with tight cracks, less than 10′ apart.**

◄ **Transverse cracking less than 10′ apart; cracks well-sealed.**

▼ **Large blocks, early signs of raveling and block cracking.**

▼ **Open crack, 1/2″ wide; adjoining pavement sound.**

▼ **Moderate flushing.**

## RATING 5

**FAIR —**
**Preservative maintenance treatment required**

Roads are still in good structural condition but clearly need sealcoating or overlay. They may have moderate to severe surface raveling with significant loss of aggregate. First signs of longitudinal cracks near the edge. First signs of raveling along cracks. Block cracking up to 50% of surface. Extensive to severe flushing or polishing. Any patches or edge wedges are in good condition.

▼ **Block cracking with open cracks.**

► **Moderate to severe raveling in wheel paths.**

▼ **Severe flushing.**

▲ **Wedges and patches extensive but in good condition.**

## RATING 4

**FAIR —**
**Structural improvement required**

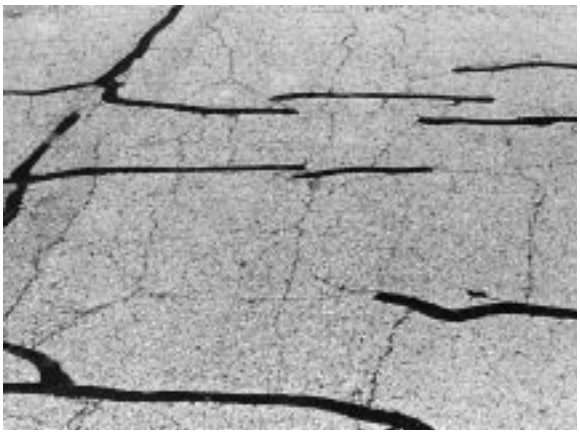
Roads show first signs of needing strengthening by overlay. They have very severe surface raveling which should no longer be sealed. First longitudinal cracking in wheel path. Many transverse cracks and some may be raveling slightly. Over 50% of the surface may have block cracking. Patches are in fair condition. They may have rutting less than 1/2" deep or slight distortion.

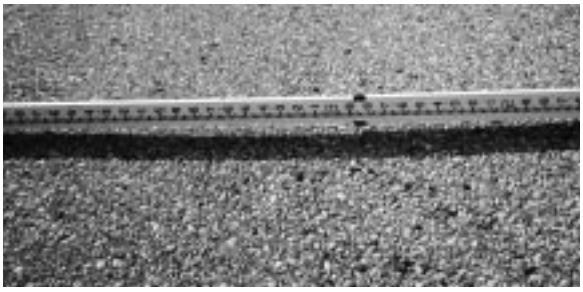
**Severe raveling with ▼ extreme loss of aggregate.**

**Load cracking and slight ▼ rutting in wheel path.**

**◄ Longitudinal cracking; early load-related distress in wheel path. Strengthening needed.**

**▼ Slight rutting; patch in good condition.**





**▼ Extensive block cracking. Blocks tight and sound.**

**◄ Slight rutting in wheel path.**

## RATING 3

**POOR—**
**Structural improvement required**

Roads must be strengthened with a structural overlay (2" or more). Will benefit from milling and very likely will require pavement patching and repair beforehand. Cracking will likely be extensive. Raveling and erosion in cracks may be common. Surface may have severe block cracking and show first signs of alligator cracking. Patches are in fair to poor condition. There is moderate distortion or rutting (1-2") and occasional potholes.

► **Many wide and raveled cracks indicate need for milling and overlay.**

► **2" ruts need mill and overlay.**

► **Open and raveled block cracks.**

## RATING 3

**POOR —** (continued)
**Structural improvement required**

◄ **Alligator cracking. Edge needs repair and drainage needs improvement prior to rehabilitation.**

▼ **Distortion with patches in poor condition. Repair and overlay.**

## RATING 2

**VERY POOR—**
**Reconstruction required**

Roads are severely deteriorated and need reconstruction. Surface pulverization and additional base may be cost-effective. These roads have more than 25% alligator cracking, severe distortion or rutting, as well as potholes or extensive patches in poor condition.

► **Extensive alligator cracking. Pulverize and rebuild.**

▲ **Severe rutting. Strengthen base and reconstruct.**

▲ **Patches in poor condition, wheelpath rutting. Pulverize, strengthen and reconstruct.**

► **Severe frost damage. Reconstruct.**

## RATING 1

**FAILED —**
**Reconstruction required**

Roads have failed, showing severe distress and extensive loss of surface integrity.

◄
**Potholes from frost damage. Reconstruct.**

◄
**Potholes and severe alligator cracking. Failed pavement. Reconstruct.**

◄
**Extensive loss of surface. Rebuild.**

# Practical advice on rating roads

### Inventory and field inspection

Most agencies routinely observe roadway conditions as a part of their normal work and travel. However, an actual inspection means looking at the entire roadway system as a whole and preparing a written summary of conditions. This inspection has many benefits over casual observations. It can be helpful to compare segments, and ratings decisions are likely to be more consistent because the roadway system is considered as a whole within a relatively short time.

An inspection also encourages a review of specific conditions important in roadway maintenance, such as drainage, adequate strength, and safety.

A simple written inventory is useful in making decisions where other people are involved. You do not have to trust your memory, and you can usually answer questions in more detail. Having a written record and objective information also improves your credibility with the public.

Finally, a written inventory is very useful in documenting changing roadway conditions. Without records over several years it is impossible to know if road conditions are improving, holding their own, or declining.

Annual budgets and long range planning are best done when based on actual needs as documented with a written inventory.

The Wisconsin DOT local road inventory (WISLR) is a valuable resource for managing your local roads. Adding PASER surface condition ratings is an important improvement.

### Averaging and comparing sections

For evaluation, divide the local road system into individual segments which are similar in construction and condition. Rural segments may vary from ½ mile to a mile long, while sections in urban areas will likely be 1-4 blocks long or more. If you are starting with the WISLR Inventory, the segments have already been established. You may want to review them for consistent road conditions.

Obviously, no roadway segment is entirely consistent. Also, surfaces in one section will not have all of the types of distress listed for any particular rating. They may have only one or two types. Therefore, some averaging is necessary.

The objective is to rate the condition that represents the majority of the roadway. Small or isolated conditions should not influence the rating. It is useful to note these special conditions on the inventory form so this information can be used in planning specific improvement projects. For example, some spot repairs may be required.

Occasionally surface conditions vary significantly within a segment. For example, short sections of good condition may be followed by sections of poor surface conditions. In these cases, it is best to rate the segment according to the worst conditions and note the variation on the form.

The overall purpose of condition rating is to be able to compare each segment relative to all the other segments in your roadway system. On completion you should be able to look at any two pavement segments and find that the better surface has a higher rating.

Within a given rating, say 6, not all pavements will be exactly the same. However, they should all be considered to be in better condition than those with lower ratings, say 5. Sometimes it is helpful in rating a difficult segment to compare it to other previously rated segments. For example, if it is better than one you rated 5 and worse than a typical 7, then a rating of 6 is appropriate. Having all pavement segments rated in the proper relative order is most important and useful.

### Assessing drainage conditions

Moisture and poor pavement drainage are significant factors in pavement deterioration. Some assessment of drainage conditions during pavement rating is highly recommended. While you should review drainage in detail at the project level, at this stage simply include an overview drainage evaluation at the same time as you evaluate surface condition.


**Urban drainage.**

**RATING: Excellent**

**Good rural ditch and driveway culvert. Culvert end needs cleaning.**

**RATING: Good**

**High shoulder and no ditch lead to pavement damage. Needs major ditch improvement for a short distance.**

**RATING: Fair**

**No drainage leads to failed pavement.**

**RATING: Poor**

Consider both pavement surface drainage and lateral drainage (ditches or storm sewers). Pavement should be able to quickly shed water off the surface into the lateral ditches. Ditches should be large and deep enough to drain the pavement and remove the surface water efficiently into adjacent waterways.

Look at the roadway crown and check for low surface areas that permit ponding. Paved surfaces should have approximately a 2% cross slope or crown across the roadway. This will provide approximately 3" of fall on a 12' traffic lane. Shoulders should have a greater slope to improve surface drainage.

A pavement's ability to carry heavy traffic loads depends on both the pavement materials (asphalt surfacing and granular base) and the strength of the underlying soils. Most soils lose strength when they are very wet. Therefore, it is important to provide drainage to the top layer of the subgrade supporting the pavement structure.

In rural areas, drainage is provided most economically by open ditches that allow soil moisture to drain laterally. As a rule of thumb, the bottom of the ditch ought to be at least one foot below the base course of the pavement in order to drain the soils. This means that minimum ditch depth should be about 2' below the center of the pavement. Deeper ditches, of course, are required to accommodate roadway culverts and maintain the flow line to adjacent drainage channels or streams.

You should also check culverts and storm drain systems. Storm drainage systems that are silted in, have a large accumulation of debris, or are in poor structural condition will also degrade pavement performance.

The T.I.C. publication, ***Drainage Manual: Local Road Assessment and Improvement,*** describes the elements of drainage systems, depicts them in detailed photographs, and explains how to rate their condition. Copies are available from the Transportation Information Center.

## Planning annual maintenance and repair budgets

We have found that relating a normal maintenance or rehabilitation procedure to the surface rating scheme helps local officials use the rating system. However, an individual surface rating should not automatically dictate the final maintenance or rehabilitation technique.

You should consider future traffic projections, original construction, and pavement strength since these may dictate a more comprehensive rehabilitation than the rating suggests. On the other hand, it may be appropriate under special conditions to do nothing and let the pavement fully deteriorate, then rebuild when funds are available.

## Summary

Using local road funds most efficiently requires good planning and accurate identification of appropriate rehabilitation projects. Assessing roadway conditions is an essential first step in this process. This asphalt pavement surface condition rating procedure has proved effective in improving decision making and using highway funds more efficiently. It can be used directly by local officials and staff. It may be combined with additional testing and data collection in a more comprehensive pavement management system.

## *Transportation Information Center Publications*

**Pavement Surface Evaluation and Rating (PASER) Manuals**

**Asphalt PASER Manual,** 2002, 28 pp.

**Brick and Block PASER Manual,** 2001, 8 pp.

**Concrete PASER Manual,** 2002, 28 pp.

**Gravel PASER Manual,** 2002, 20 pp.

**Sealcoat PASER Manual,** 2000, 16 pp.

**Unimproved Roads PASER Manual,** 2001, 12 pp.

**Drainage Manual**
Local Road Assessment and Improvement, 2000, 16 pp.

**SAFER Manual**
Safety Evaluation for Roadways, 1996, 40 pp.

**Flagger's Handbook** (pocket-sized guide), 1998, 22 pp.

**Work Zone Safety,** Guidelines for Construction, Maintenance, and Utility Operations, (pocket-sized guide), 1999, 55 pp.

**Wisconsin Transportation Bulletins**

#1 Understanding and Using Asphalt
#2 How Vehicle Loads Affect Pavement Performance
#3 LCC—Life Cycle Cost Analysis
#4 Road Drainage
#5 Gravel Roads
#6 Using Salt and Sand for Winter Road Maintenance
#7 Signing for Local Roads
#8 Using Weight Limits to Protect Local Roads
#9 Pavement Markings
#10 Seal Coating and Other Asphalt Surface Treatments
#11 Compaction Improves Pavement Performance
#12 Roadway Safety and Guardrail
#13 Dust Control on Unpaved Roads
#14 Mailbox Safety
#15 Culverts-Proper Use and Installation
#16 Geotextiles in Road Construction/Maintenance and Erosion Control
#17 Managing Utility Cuts
#18 Roadway Management and Tort Liability in Wisconsin
#19 The Basics of a Good Road
#20 Using Recovered Materials in Highway Construction
#21 Setting Speed Limits on Local Roads

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# PASER

## Asphalt Roads