PAVEMENT SURFACE EVALUATION AND RATING STUDY – WARSAW, INDIANA

PREPARED FOR:

CITY OF WARSAW COMMON COUNCIL
KOSCIUSKO COUNTY, INDIANA

2016 - PASER

Table of Contents

APPENDIX

PAVEMENT SURFACE EVALUATION AND RATING STUDY (PASER)

City of Warsaw, Indiana

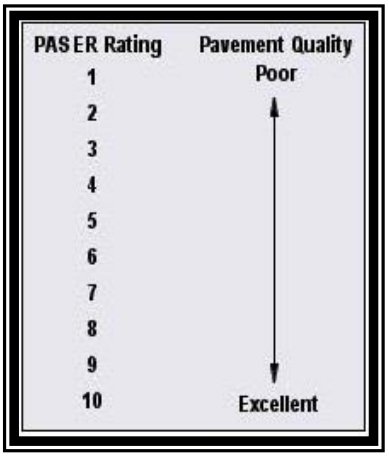
By Jeff Beeler
April 3rd, 2016

A. PURPOSE OF REPORT:

The purpose of this report is to provide City of Warsaw an accurate assessment of their current roadway condition, and help guide upcoming roadway maintenance and repairs.

The scope of this project was to evaluate all asphalt and concrete roadways within Warsaw's jurisdiction, utilizing the PASER guidelines. The Complete PASER Manual for evaluating HMA roadways is attached to this report in Appendix B.

B. WHAT IS THE PASER SYSTEM?



The Pavement Surface Evaluation and Rating (PASER) system visually evaluates the condition of road segments. The PASER system rates each segment on a scale of 1 – 10 with 1 being the worst condition and 10 being the best condition (new pavement). Ratings of 1 to 4 indicate Poor Condition, 4 to 6 represent Fair, and 7 to 10 represent Good Condition.

PASER also recommends needed maintenance or repair, based on the condition of the roadway. A description of visible distress and recommended treatment measures are provided on a summary sheet, page A-1 of the appendix.

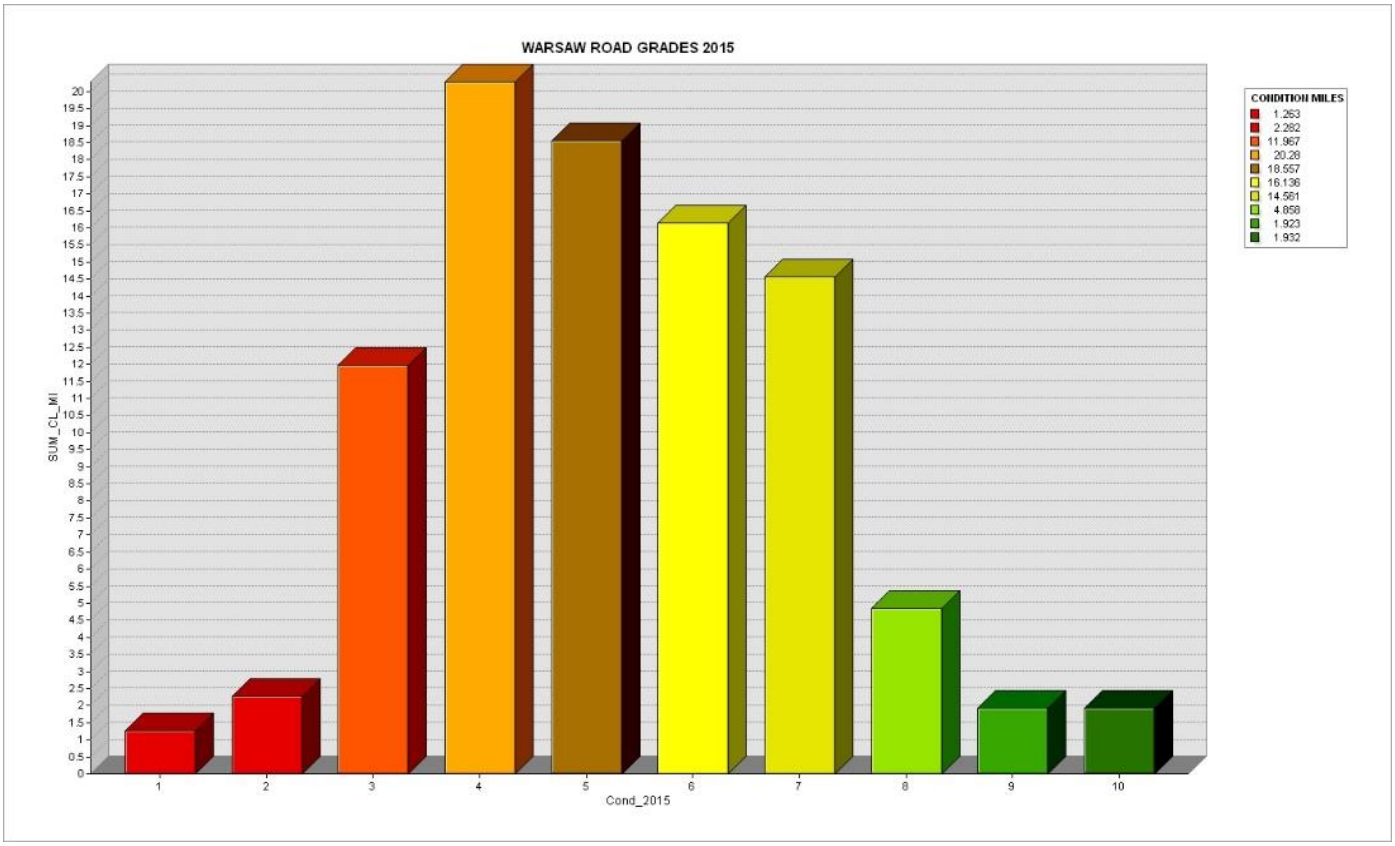
C. STUDY METHODOLOGY:

Warsaw used a mixed group from MACOG and our staff as the data collection team. Data for the 2016 year was collected in September of 2015. Each roadway segment was driven and assigned a grade. The data collection team was looking closely at each roadway segment for surface defects, such as raveling or polishing, surface deformation, such as rutting or rippling, cracks and areas of patching. Roadway segments were defined from intersection to intersection along each roadway, unless a defined change in roadway characteristics was encountered. In the cases where a significant change in the roadway characteristics was encountered mid-block, additional segments were added in order to accurately reflect the correct PASER ratings. At the end of the segment, the team discussed the roadway and documented on a data collection sheet the factors that resulted in the segment rating. All segments were entered into a spreadsheet that will allow for easy data presentation.

D. CITY OF WARSAW ROADWAY NETWORK:

Warsaw is responsible for 95 miles of roadway. This equates to around 220 lane miles due to some of our roads being three lanes. This roadway PASER study focused on the hard surface roadways only.

Results of the 2016 PASER Ratings are shown below in chart form



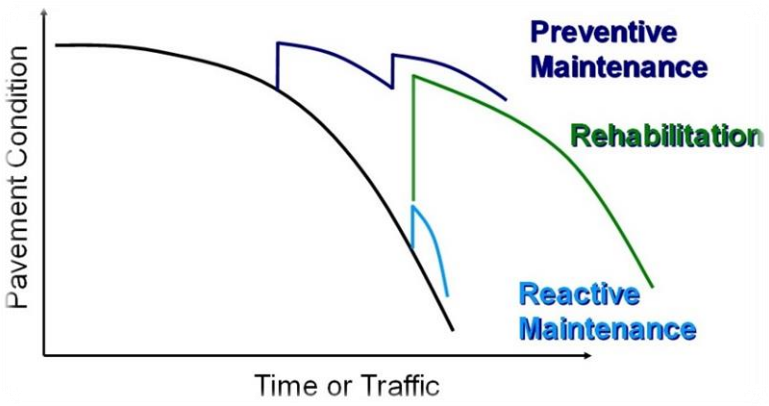
A color coded map of Warsaw's road network is included on page A-2 of the Appendix.

E. HOW TO USE THE PASER DATA:

The 2015 PASER data is in spreadsheet form, as well as shapefiles provided for use in the Warsaw GIS system. Warsaw can easily sort this data in a variety of ways. Possible data sorting scenarios include the following:

-All Data sorted by PASER rating (low to high)
-PASER rating per Council District
-Roads requiring reconstruction sorted by Traffic Volume (In process)
-numerous other scenarios, as desired by the City

F. PAVEMENT MAINTENANCE:



Left alone pavements will typically deteriorate over time at an ever-increasing rate. Maintenance and rehabilitation can slow or reverse this deterioration. The degree to which this occurs is dependent on the type of maintenance or rehabilitation as well as the timing of such actions. In general, an early and systematic maintenance and rehabilitation plan is the most cost effective and results in the greatest extension of useful pavement life. This concept is further illustrated in the figure to the right and the tables below outline the proposed maintenance on Warsaw's roadways and the estimated costs associated with the implementation of such a program. Maintenance items such as crack sealing and seal coating are low cost treatments that can be performed on higher PASER rated roadways to keep the pavement in good condition and extend the overall life of the pavement.

G. COST CONSIDERATIONS:

Improvements to Warsaw Roadways Rated 4 or below: Structural improvements are recommended for Roadways Rated 4 or below. The adjacent table shows the assumptions made, and are based on PASER recommendations.

Recommended Improvements based on PASER Ratings	
PASER Rating	**Proposed Treatment**
1	Reconstruct with 7.5" HMA*
2	Reconstruct with 7.5" HMA*
3	Mill, Overlay with 2" HMA, full depth patching of 25%
4	Mill, Overlay with 1.5" HMA, full depth patching of 5%
	* HMA Section would typically consist of 1.5" HMA Surface on 6" HMA Base

The adjacent table summarizes the anticipated costs associated with Warsaw roads with PASER ratings of 4 or below:

COST SUMMARY			
PASER Rating	Number of Lane Miles*	Cost of Treatment per Lane Mile*	Total Cost of Improvements
1	2.52	$352,000	$887,040
2	4.56	$352,000	$1,605,120
3	23.94	$141,000	$3,375,540
4	40.56	$75,000	$3,042,000
			$8,909,700

**A Lane Mile is defined as one 11' lane times 1 mile in length (i.e. A 20' wide roadway one mile in length equals 1.82 Lane Miles.*

Maintenance to Warsaw Roadways Rated 5 and above:

Periodic maintenance items are recommended for Roadways Rated 5 and above. The adjacent table shows the assumptions made, and are based on PASER recommendations.

Recommended Maintenance based on PASER Ratings	
PASER Rating	**Proposed Treatment**
5	Sealcoat or thin overlay
6	Crack sealing and possible seal coat
7	Routine crack sealing
8 & 9	Test roadway for applying a restoring additive to pavement
10	No maintenance required

The adjacent table summarizes the anticipated costs associated with Warsaw roads with PASER ratings of 5 and above:

MAINTENANCE COST SUMMARY			
PASER Rating	Number of Lane Miles*	Cost of Treatment per Lane Mile*	Cost of Maintenance
5	37.11	$34,000[5*]	$1,261,740
6	32.27	$3,500[6*]	$115,000
7	29.12	$2,000[7*]	$60,000
8 &9	13.56	$7,500[8*]	$105,000
10	3.86	$7,500	$28,000
Total			**$1,569,740**
5* cost is based on sealcoating on a 5 year cycle **6* cost is based on crack sealing every 2 years** **7* cost is based on crack sealing every 2 years** **8* cost is based on applying rejuvenator every 5 years**			

H. DRAINAGE CONDITIONS:

The drainage that Warsaw has on its roadways consist of curb and gutter and drainage swales. Drainage systems are checked for proper operation during routine maintenance activities and during rain events. As soon as issues are found we try and correct them as soon as time and money allows.

I. RIGHT OF WAY

Most of Warsaw's right of way is platted and recorded. In the few areas where it is not the right of way is established by public use. Generally all work done on the roadways is able to be completed within the right of way. In areas where it is not the right of way is purchased following the proper procedures.

J. FUTURE USE OF PASER DATA:

The data collected and the tools developed through this study provide a baseline for the condition of the Warsaw roadway network at the time of this study. However, the conditions of roadways are always changing, therefore, Warsaw will make PASER evaluations a regular part of our maintenance program. Routine inspections should be performed and all pavements should be evaluated and conditions documented every year. The baseline information developed through this study, combined with data obtained through subsequent PASER Evaluations will provide Warsaw with useful information on the adequacy of current roadway maintenance and reconstruction practices. It is recommended that Warsaw evaluate their roadway system on a yearly cycle.

K. RECOMMENDATIONS:

Warsaw will utilize this PASER data as a tool to assist with a complete Pavement Maintenance Program, which includes reconstructing the roadways that have failed, rehabilitating roadways before they fail, and maintaining roadways with crack sealing and seal coating before they need rehabilitation.

J. GOALS AND EXPECTED LEVEL OF SERVICE:

Warsaw would like to see our roads at a PASER rating of 6 or above. By achieving an overall rating of 6, the road ways provided to our citizens would first provide a good driving surface. Secondly a level 6 road would provide a safe surface for recreation like biking, rollerblading, and walking which would help improve the health benefits in our community.

Appendix