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PAVEMENT MANAGEMENT GROUP

PAVEMENT MANAGEMENT FINAL PROJECT REPORT

Olmsted TWP, OH

Wednesday, November 30, 2022

Pavement Management Group

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EXECUTIVE SUMMARY

Hovancsek & Associates contracted with Pavement Management Group (PMG) to provide a turn-key Pavement Management Program (PMP) for Olmsted Township. The backbone of PMG's turnkey PMP is the PAVER Pavement Management System (PMS) which provides specific tools such as pavement modeling, maintenance decision trees and budget/target driven scenarios maximizing the return on investment from available maintenance and rehabilitation funds, generating a prioritized plan, and identifying specific areas in need of maintenance and rehabilitation.

- Verify and setup any new pavement network inventory
- Provide an HD video of each pavement section
- Determine total samples to inspect per section
- Identify all distress types, severity levels and quantities within through ASTM D6433-20
- Calculate the Pavement Condition Index (PCI) for each pavement section
- Assign all pavement management data to GIS
- Create GIS current condition map
- Provide an HTML based condition map with geo located streaming HD video
- Provide a complete inventory and condition listing of each pavement section
- Provide a final report of findings
- Provide continued support services

2022 ROADWAY NETWORK SUMMARY

- 21 centerline miles
- 40 lane miles (Lane = 12 feet wide)
- 2,553,480 square feet
- 191 management sections
- Average network PCI is 78
- Average network condition category of GOOD

INTRODUCTION

PMG was contracted by Hovancsek & Associates to provide pavement management services for Olmsted Township's 21-centerline mile (40 lane mile) roadway network. Through these services a field inventory setup of any new roads, an inventory review and inspections were performed on all 191 management sections within the network. All inventory items were added or updated within their PMS database and a PCI was calculated for each section. HD videos were taken at each section location (from beginning to end of section). This provides for a virtual, high-definition account of the roadway network, and provides value in a variety of ways such as condition review and network level decision making from the office. This report provides a thorough definition of the inspection process performed as well as the condition results of our project.

CONDITION ASSESSMENT PROCESS

PMG adheres to the ASTM D6433-20 standard for assessing the condition of asphalt and concrete surfaces. Our skilled inspection team reviews high-definition video of each pavement section in conjunction with our proprietary artificial intelligence (AI) model to identify and document the distress types, severity levels, and quantities that are occurring. The data goes into the PAVER™ Pavement Management System (PMS) for Pavement Condition Index (PCI) calculation, resulting in a PCI score for each management section within the network.

PAVEMENT DISTRESS DEFINITION

20 possible distress types can occur within asphalt-based surfaces and 19 possible distress types that can occur within a concrete surface. The U.S. Army Corps of Engineers publishes the Asphalt Distress Manual and the Concrete Distress Manual. These manuals describe each distress type, the criteria to determine each severity level (low, medium, high), and how to measure each. The asphalt and concrete distress types are highlighted below in Figure 1.

01 – Alligator Cracking	06 – Depression	11 – Patch/Utility Cut	16 – Shoving
02 – Bleeding	07 – Edge Cracking	12 – Polished Aggregate	17 – Slippage Cracking
03 – Block Cracking	08 – Joint Reflection	13 – Pothole	18 – Swell
04 – Bumps and Sags	09 – Lane/Shoulder Drop	14 – Railroad Crossing	19 – Raveling
05 - Corrugation	10 – L&T Cracking	15 – Rutting	20 – Weathering
21 – Blow Up/Buckling	26 – Joint Seal Damage	31 – Polished Aggregate	36 – Scaling
22 – Corner Break	27 – Lane/Shoulder Drop	32 – Popouts	37 – Shrinkage Cracks
23 – Divided Slab	28 – Linear Cracking	33 – Pumping	38 – Corner Spalling
24 – Durability Cracking	29 – Large Patch/Utility Cut	34 – Punchout	39 – Join Spalling
25 - Faulting	30 – Small Patch	35 – Railroad Crossing	

Figure 1. Asphalt and Concrete Distresses

PCI AND CONDITION CATEGORY DEFINITION

The PCI is on a scale of 0 – 100 with 0 being the worst and 100 being the best. PAVER calculates it through the input of distress type, severity, and quantity information. Figure 2 illustrates the factors that go into the PCI and the 5 condition categories of the PCI.

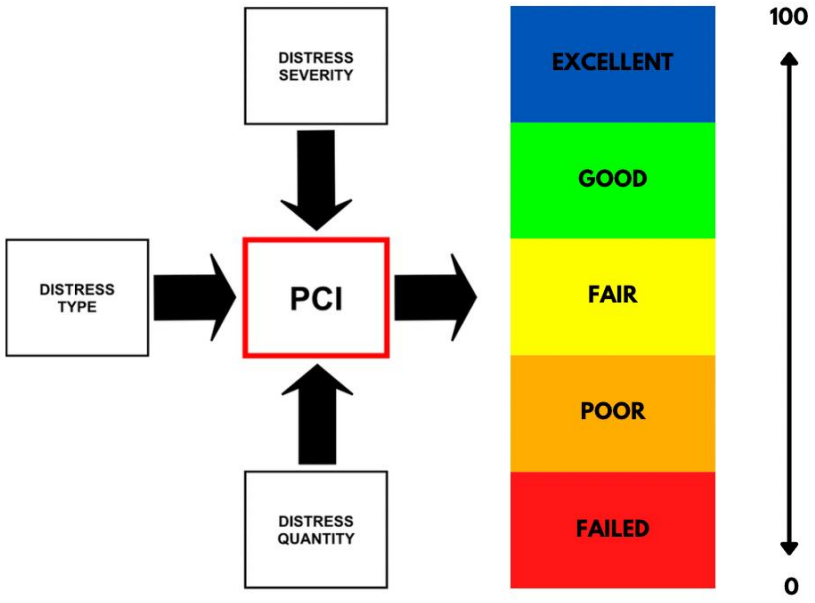

Figure. 2 Factors Determining PCI Value

CONDITION CATEGORY	LOW PCI VALUE	HIGH PCI VALUE
EXCELLENT	90	100
GOOD	70	89
FAIR	50	69
POOR	30	49
FAILED	0	29

Table 1. Condition Category Values

EXAMPLES OF ROADWAY CONDITIONS

During the inspection process, high resolution video was captured for each management section. A snapshot from several videos have been chosen to provide as documentation for this report of the inspected section location and serves as visual identification as to what types of distresses are occurring within the pavement section. The following 2022 images of pavements from within the Roadway Network provide a sense of what various PCI levels look like:

EXCELLENT CONDITION

SWEET GUM TRL | SECTION 03 | PCI 96

GOOD CONDITION

LAUREL LN | SECTION 03 | PCI 74

FAIR CONDITION

HUNTERS RIDGE LN | SECTION 05 | PCI 69

POOR

AVONDALE CT | SECTION 01 | PCI 32

FAILED

NONE IN NETWORK

NETWORK CONDITION RESULTS

After completion of the 2022 pavement management project, PMG has determined that the average PCI for Olmsted Township's 40 lane mile (21 Centerline Mile) roadway network is a 78 and considered to be in "GOOD" condition. Table 2 displays the condition summary data by category across the network while Figures 3 and 4 illustrate the conditions in graph form. A complete Inventory and Condition Report in Excel spreadsheet was provided as a part of this project deliverable.

CONDITION CATEGORY	SECTIONS	CENTERLINE MILES	LANE MILES	PAVEMENT AREA (SF)	PERCENT AREA	AVERAGE CONDITION
EXCELLENT	37	3.9	7.42	470,300	18.42%	93
GOOD	116	14.02	26.78	1,696,508	66.44%	80
FAIR	32	2.61	4.93	312,258	12.23%	63
POOR	6	0.62	1.17	74,414	2.91%	44
FAILED	0	0	0.00	0	0.00%	0
TOTALS	191	21	40	2,553,480	100%	

Table 2. Condition Summary

CONDITION GRAPHS

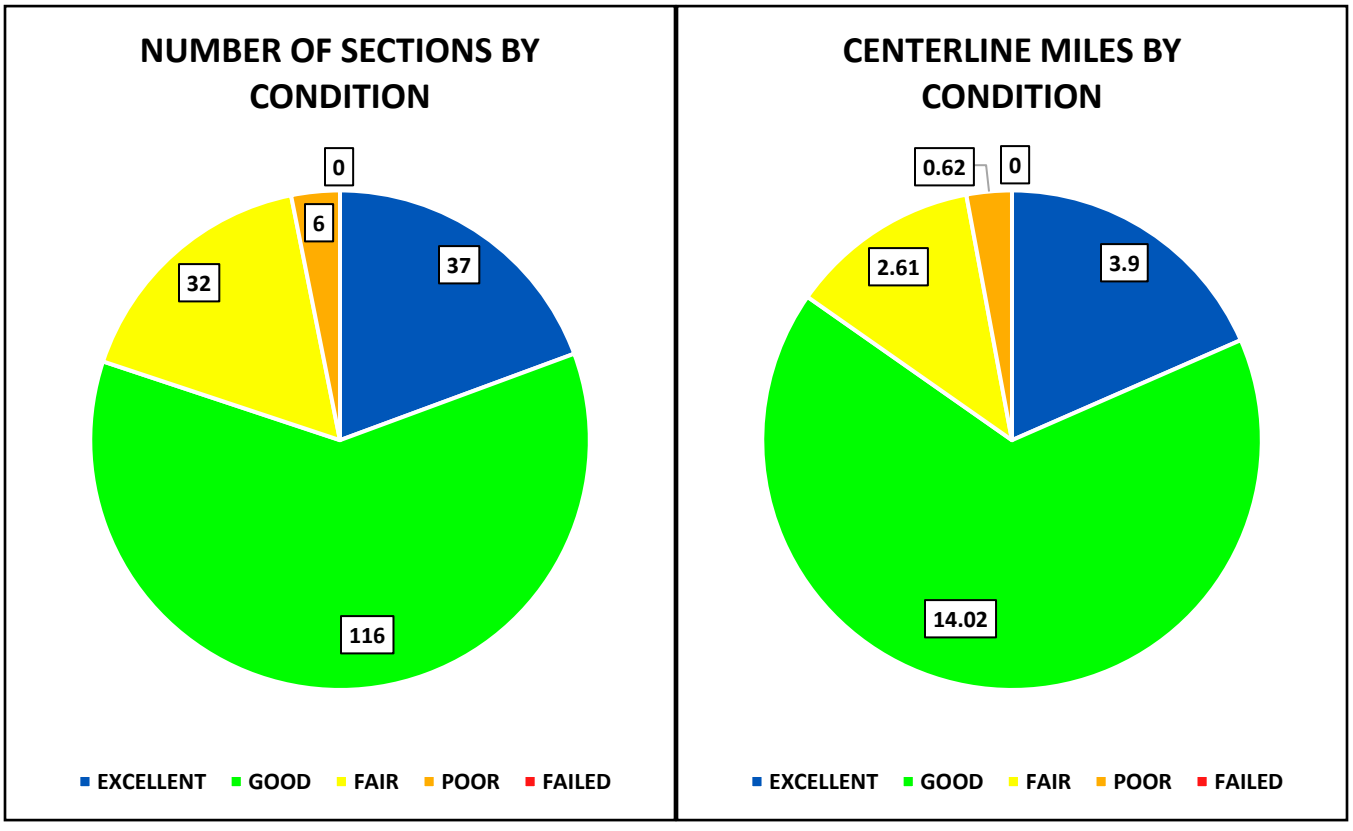

Figure 3. Number of Sections and Centerline Miles by Condition Category

SURFACE GRAPHS

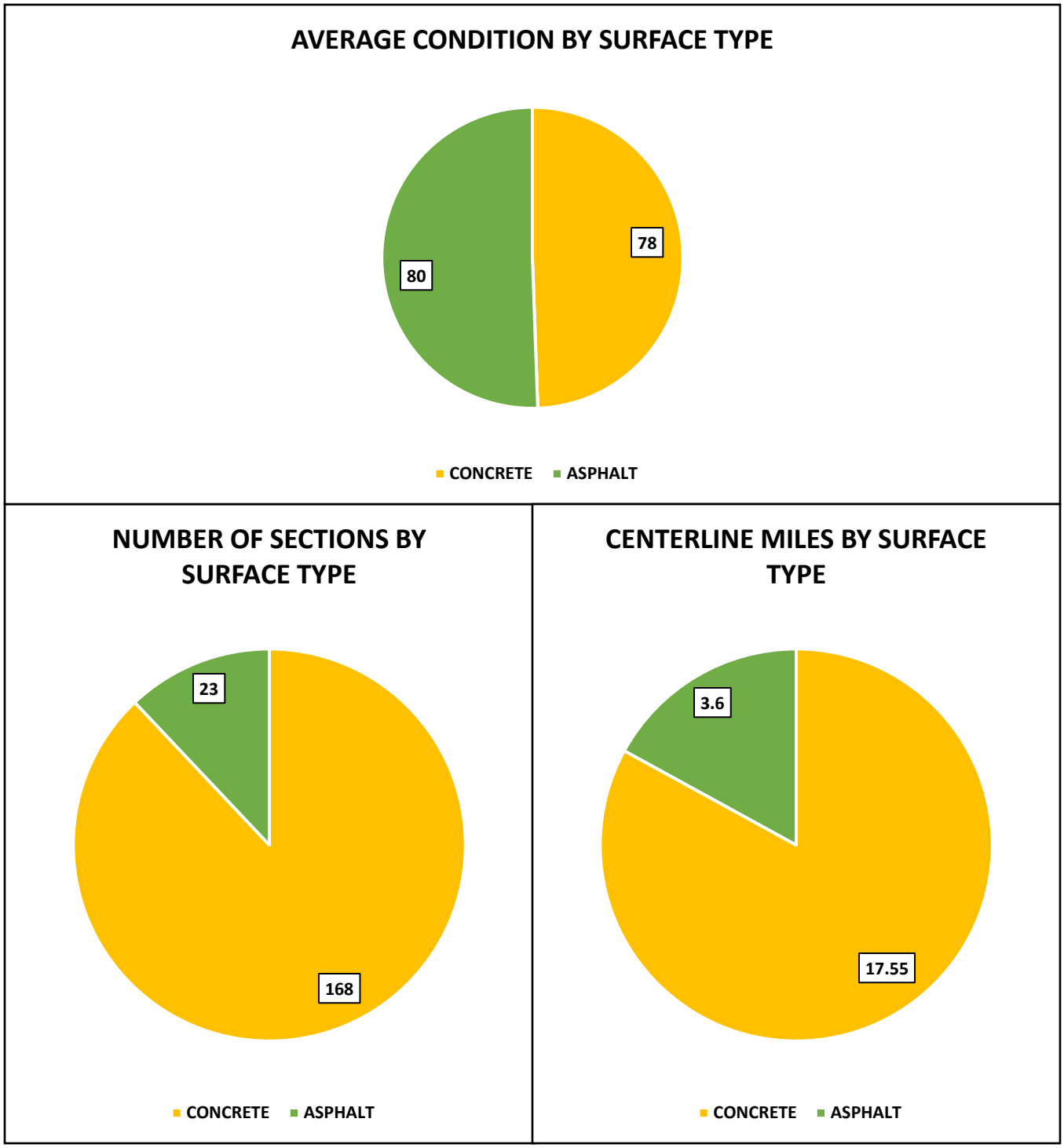

Figure 4. Average Condition, Number of Sections, and Centerline Miles by Surface Type

GIS CONDITION MAP

PMG assigned all pavement management data to GIS and will provide the shapefile to the agency. This allows for a wide variety of mapping options within both ESRI's ArcGIS and Google Earth. The following shows an example of a Latest Condition Map that has been created in both GIS and Google Earth for illustrative purposes. An ANCI Size C plot ready PDF version has been provided as a part of the project deliverable.

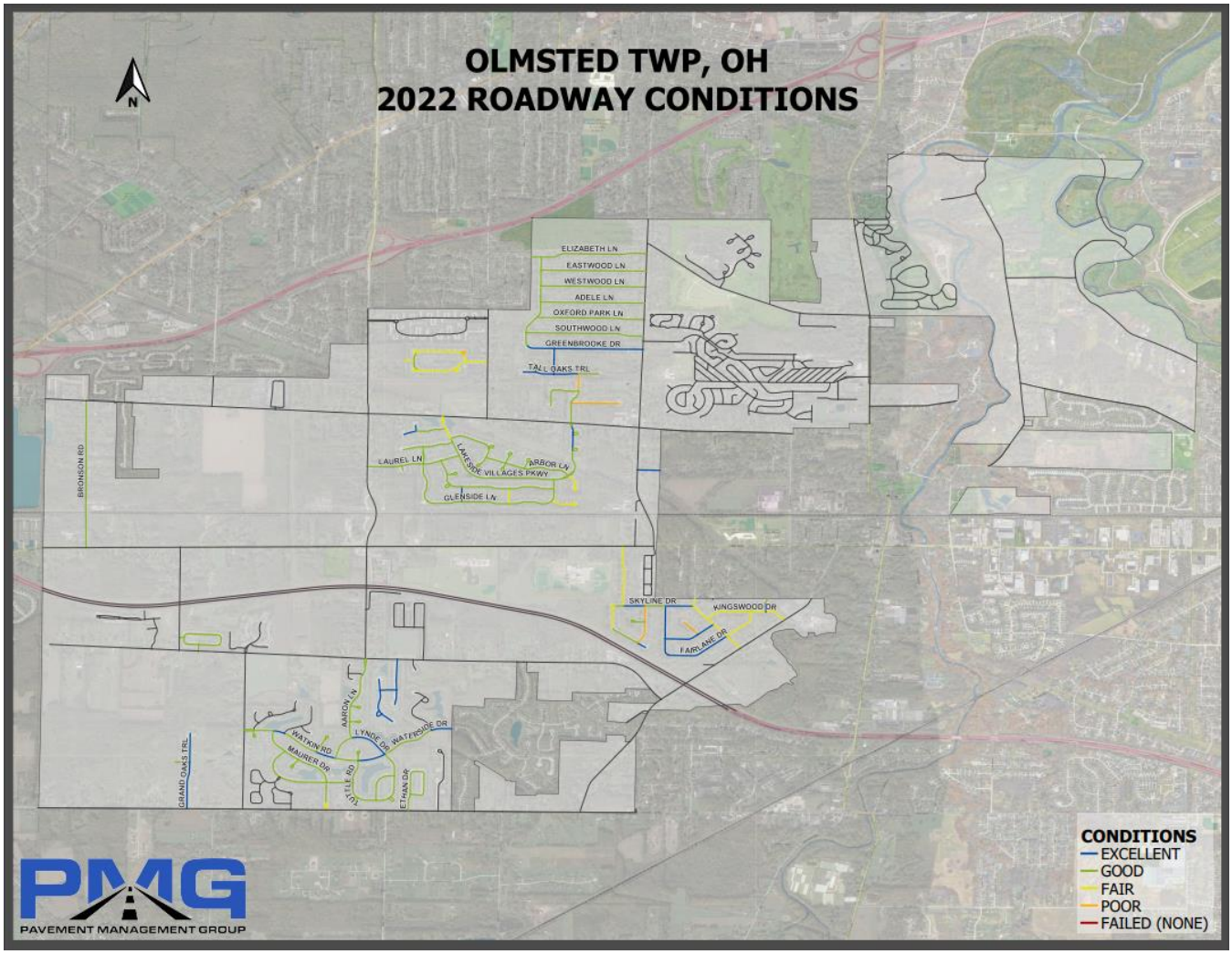

Figure 5. Roadway Section Latest Condition maps

CONCLUSION

The PCI study provides for a PCI rating on each pavement section within the maintained roadway network. Based upon the distresses identified within each representative sample location inspected, a PCI number is assigned to each pavement section. This number is on a scale of 0 – 100 with 0 being the worst and 100 being the best.

The Olmsted Township roadway network is approximately 40 lane miles (21 centerline miles) in size. Through the ASTM D6433-20 PCI study, PMG has determined the roadway network has an average PCI of **78** and is classified as being in **GOOD** condition.

PMG would again like to thank Hovancsek & Associates for the opportunity to provide Olmsted Township with this PCI study and our pavement management services. Our goal is to provide the highest level of services and support, providing our clients with the data, tools, and expertise necessary to be successful in their goals of pavement management. Should you require any additional information or support regarding this PCI study or the PAVER™ PMS, please do not hesitate to ask.

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