

The State of Michigan Transportation



2003-2015 PASER Road Survey

For Cass County, Michigan



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Appendix (available at http://swmpc.org/asset_mgmt.c.asp):

- PASER Asphalt Rating Chart
- PASER Concrete Rating Chart
- PASER Gravel Rating Chart
- Last Rating Entered for All Roads (Local and Federal)
- PASER Thematic Maps

PROJECT OVERVIEW

Since 2003, the Southwest Michigan Planning Commission (SWMPC) and representatives of each of the three counties (Berrien, Cass, and Van Buren) in the Southwest Region and the Michigan Department of Transportation (MDOT) have jointly conducted annual assessments of the condition of the Southwest Region's federal aid eligible roads. These assessments have utilized the Pavement Surface Evaluation and Rating (PASER) system in establishing road conditions. The effort has been funded and administered through the State of Michigan Transportation Asset Management Council and has satisfied the Governmental Accounting Standards Board Statement 34 (GASB 34), requiring tri-annual road assessments for governmental units receiving federal aid, doing so with minimal staff over short time periods. SWMPC hopes to use the data gathered here to assist member agencies in developing plans for the effective management of their pavement networks.

METHODOLOGY: THE PASER ROAD RATING SYSTEM

PASER, or Pavement Surface Evaluation and Rating, is a visual test of the surface condition of the road that utilizes a ten-point scale, focusing on pavement conditions; structural or geometric defects are not considered in determining the ratings. Ratings are applied to road segments of varying length, with segment values ranging from 10 for a new road segment to 1 for a completely failed segment, and specific ratings determined by the number and type of surface defects. The ratings are compiled by teams of three to four individuals who drive the roads and conduct windshield surveys. PASER rating charts for asphalt, concrete, and gravel roads have been included in the appendix of this report.

PASER Rating	Pavement Quality
10	Excellent
9	
8	
7	
6	
5	
4	
3	
2	
1	Poor

The State of Michigan Asset Management Council has requested that the information gathered in this survey be reported using the following categories:

- **Roads with PASER ratings of 8-10 require Routine Maintenance.** Routine maintenance encompasses day-to-day maintenance activities, such as street sweeping, drainage clearing, shoulder gravel grading, and sealing cracks to prevent standing water and water penetration.
- **Roads with PASER ratings of 5-7 require Capital Preventive Maintenance.** Capital preventive maintenance is a planned set of cost effective treatments to an existing roadway system that retard future deterioration and maintain or improve the functional condition of the system without significantly increasing structural capacity. The purpose of capital preventive maintenance fixes is to protect the

pavement structure, slow the rate of pavement deterioration, and/or correct pavement surface deficiencies. These treatments are targeted at pavement surface defects primarily caused by the environment and by pavement material deficiencies.

- **Roads with PASER ratings of 1-4 require Structural Improvements.** This category includes work identified as rehabilitation and reconstruction, addressing the structural integrity of a road.

Computer Equipment and Software

Teams collected data using a laptop computer with the RoadSoft GIS Laptop Data Collector software loaded. A Garmin GPS 35 PC TracPak Global Position System unit was connected to the laptop to track position and locate road segments. RoadSoft GIS is an asset management software package created and distributed free of charge by the Michigan Technology Institute's Technology Development Group. The current version of the program was designed with a special module to collect PASER rating data, known as the Laptop Data Collector.

Staff Time

For the purposes of this project, a team of three to four members was used for collecting PASER data. Each team member played a separate role within the vehicle during the data collection. One individual drove and collaborated in the road rating, a second navigated and also collaborated in the road ratings, and a third entered the rating information into the laptop computer; when the team rated roads within a city or village, a fourth member would be added from that city or village. The team was comprised of one SWMPC representative, one representative from a county road commission (depending upon which county the team was in at the time), and one MDOT representative from the Coloma Transportation Service Center (TSC), now part of the MDOT Kalamazoo Service Group. Several cities and villages also participated in the project. Another SWMPC staff member loaded the ratings from the laptop data collector into Roadsoft and compiled this report.

Training

All participants who were in the vehicle during the rating process were required to attend a daylong training session that took place in Grand Rapids or Kalamazoo. Participants received an overview of the project and were given instruction on how to use the RoadSoft software and the PASER road rating system for data collection. Once out in the field, experienced staff members taught new participants how to use the RoadSoft program and guided them through the rating process.

RESULTS

County-Wide Results

As shown in Figure 1 and Table 1 below, the surface condition of federal aid eligible roads in Cass County has generally worsened from 2003 through 2015. The percentage of assessed road segments receiving a Good rating of 8-10 has decreased from a high of 35.4% in 2003 to a low of 0.4% in 2011. Likewise, the percentage of road segments rated Poor (1-4) grew from a low of 10.7% in 2003 to a high of 74.6% in 2015. In addition, the percentage of roads rated as Fair (5-7) declined from 54.0% in 2003 to a low of 23.4% in 2015.

Figure 1: Percentage of federal-aid eligible road segments falling under each surface condition, by year, 2003-2015 for Cass County

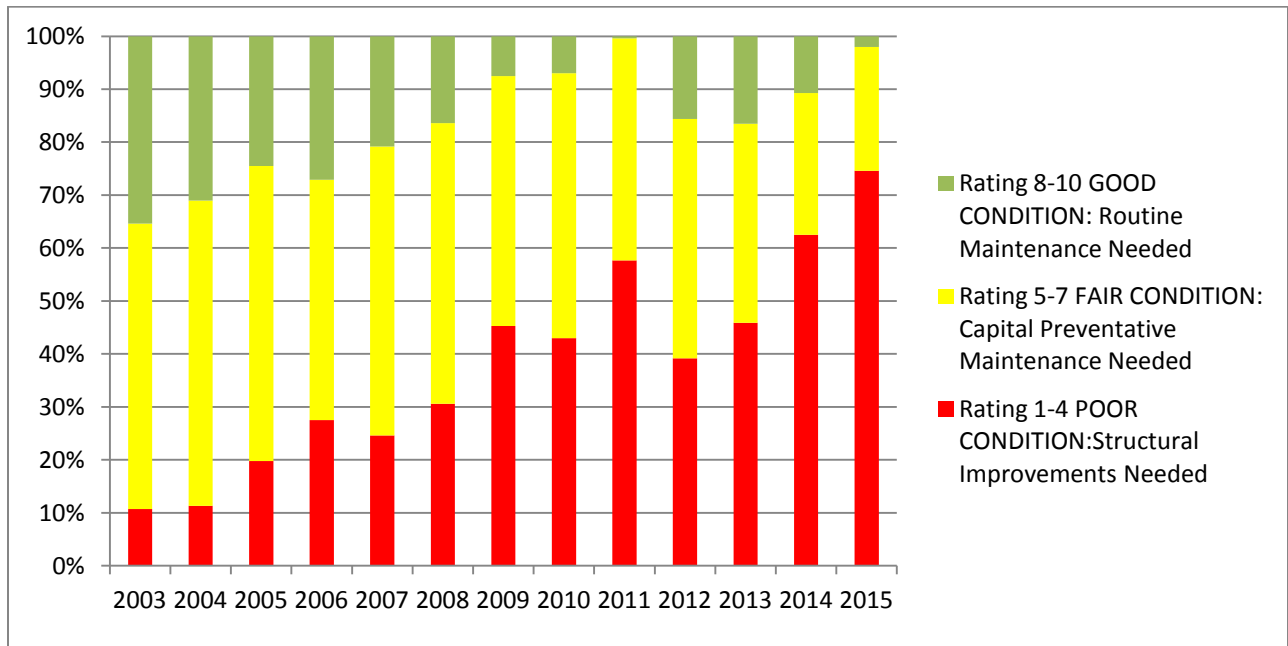


Table 1: Percentage of Roads in Each Rating Category and Total Miles Rated, 2003-2015

Year	1 to 4 Structural Improvements	5 to 7 Capital Preventive Maintenance	8 to 10 Routine Maintenance	Total	Total Miles Rated
2003	10.7%	54.0%	35.4%	100.0%	404.7
2004	11.3%	57.7%	31.0%	100.0%	406.0
2005	19.8%	55.7%	24.5%	100.0%	409.8
2006	27.5%	45.4%	27.1%	100.0%	368.4
2007	24.6%	54.5%	20.8%	100.0%	367.5
2008	30.6%	53.0%	16.4%	100.0%	214.0
2009	45.3%	47.2%	7.5%	100.0%	200.2
2010	43.0%	50.0%	7.0%	100.0%	252.5
2011	57.7%	41.9%	0.4%	100.0%	160.5
2012	39.2%	45.2%	15.6%	100.0%	212.5
2013	45.9%	37.6%	16.5%	100.0%	153.0
2014	62.5%	26.8%	10.7%	100.0%	213.5
2015	74.6%	23.4%	2.0%	100.0%	153.0
2003-2004 Totals	11.0%	55.8%	33.2%	100.0%	810.7
2014-2015 Totals	67.5%	25.4%	7.1%	100.0%	366.5
Change from 2003-04 to 2014-2015	56.5%	-30.4%	-26.1%	--	-444.2

While surface conditions show a clear downward trend, it is important to exercise care in making specific comparisons between years. Between 2003 and 2007, efforts were made to rate the entire network of federal aid eligible roads in Cass County. Beginning in 2008, however, the road network was split approximately in half, with half of the federal aid network being rated each year in order to have a full assessment of the ratings every two years. The reason for the change to rating the federal aid system entirely every two years was the asset management data collection funding would not cover the entire network statewide on an annual basis.

Thus, ratings changes between consecutive years primarily represent surface condition ratings of entirely different road segments, as opposed to changes in condition of the same segments. To account for this, Table 1 contains a row demonstrating the change in average conditions over 2003-2004 to the average conditions over 2013-2015. Again, though, the results display a clear trend toward decreasing surface ratings.

It is worth noting, however, that there was an increase in road miles rated as Good between 2011 and 2013, which would indicate improvement along the same roadway segments in almost all cases. This trend has not continued into 2015, and the percentage of roads in fair condition continues to deteriorate as well.

Road Ratings by Jurisdiction

In addition to the aggregate county-wide conditions displayed above, Table 2 (starting on page 8) displays yearly rating data by local jurisdiction for **federal-aid eligible roads only**. We encourage all interested individuals to copy and paste these tables into an Excel file or other software in order to conduct their own analysis if interested.

The portion of the table displayed on page 14 of this document provides a detailed list of how road conditions have changed at the jurisdictional level over the past 12 years. Of the 20 cities, villages, and townships in Cass County with federal aid eligible roads, 19 have seen an increase over this time in the percentage of their federal-aid eligible roads in poor condition, while, similarly only one has seen an increase in the percentage of roads in good condition. Deterioration of the pavement network seems to be the overarching trend.

In addition, 14 jurisdictions have seen a decrease in the percentage of their roads in fair condition. This decrease is directly related to the increase in the number of road miles in poor condition throughout Cass County. The reason for an increase in roads in poor condition is likely a lack of timely preventative maintenance treatments to roads that were previously maintained in fair condition, even for those jurisdictions where the percentage of roads in good condition has increased. Communities are spending large amounts of money on doing reconstruction that moves segments from “Poor” to “Good” condition, but these expenditures are unable to keep pace with the deterioration of “Fair” roads into “Poor” condition, and there is not, in many cases, enough funding left over to spend on preventative maintenance treatments. There are six jurisdictions, however, that have seen their percentage of roads in fair condition on the federal-aid system increase from 2003-2015, and these are worth analyzing further.

Part of SWMPC’s aim in compiling the PASER ratings and publishing an annual report is to promote planning that emphasizes the proper combination of structural improvements, preventative maintenance, and routine maintenance as a coordinated strategy for achieving and sustaining high- quality infrastructure.

Table 2: Percentage of Federal Aid Eligible Roads in Each PASER Category by Jurisdiction

Cass County Jurisdictions	2 0 0 3				2 0 0 4			
	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	Total Miles Rated	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	Total Miles Rated
Calvin Twp	6.8%	46.1%	47.1%	25.8	1.8%	68.9%	29.3%	25.8
Cassopolis	0.0%	81.2%	18.8%	1.3	0.0%	74.9%	25.1%	1.3
Dowagiac	10.0%	56.0%	34.0%	14.4	17.1%	56.6%	26.3%	14.7
Edwardsburg	11.3%	52.3%	36.5%	0.9	0.0%	100.0%	0.0%	0.9
Howard Twp	0.0%	74.1%	25.9%	27.3	2.3%	83.2%	14.5%	28.1
Jefferson Twp	3.2%	74.2%	22.6%	31.2	0.0%	81.3%	18.7%	31.2
Lagrange Twp	19.6%	39.0%	41.4%	36.1	21.6%	40.2%	38.2%	36.2
Marcellus	78.6%	21.4%	0.0%	0.3	86.5%	13.5%	0.0%	0.3
Marcellus Twp	8.0%	62.1%	29.9%	15.0	19.6%	31.0%	49.4%	15.0
Mason Twp	0.9%	39.6%	59.5%	20.5	0.0%	50.8%	49.2%	20.5
Milton Twp	4.3%	73.4%	22.3%	26.3	1.1%	77.8%	21.2%	26.3
Newberg Twp	24.9%	26.5%	48.6%	32.3	29.3%	28.0%	42.8%	32.3
Ontwa Twp	0.0%	58.7%	41.3%	22.9	0.0%	76.8%	23.2%	22.9
Penn Twp	18.8%	53.2%	28.0%	29.0	22.1%	47.4%	30.5%	29.0
Pokagon Twp	4.9%	82.0%	13.1%	24.4	11.0%	72.2%	16.8%	24.4
Porter Twp	7.2%	70.8%	22.1%	32.0	11.8%	60.2%	28.0%	32.0
Silver Creek Twp	18.2%	38.4%	43.5%	22.8	16.0%	33.3%	50.7%	22.9
Vandalia	0.0%	0.0%	100.0%	0.4	0.0%	100.0%	0.0%	0.4
Volinia Twp	21.2%	29.6%	49.2%	21.2	18.8%	55.8%	25.4%	21.2
Wayne Twp	16.6%	37.0%	46.5%	20.7	5.1%	50.0%	44.9%	20.8

Cass County Jurisdictions	2 0 0 5				2 0 0 6			
	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	Total Miles Rated	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	Total Miles Rated
Calvin Twp	5.7%	61.3%	33.0%	25.8	20.1%	60.7%	19.2%	23.9
Cassopolis	6.1%	88.7%	5.2%	1.3	52.7%	47.3%	0.0%	1.2
Dowagiac	26.6%	52.0%	21.5%	14.7	36.6%	43.3%	20.1%	14.7
Edwardsburg	11.3%	88.7%	0.0%	0.9	0.0%	56.1%	43.9%	0.9
Howard Twp	24.7%	53.9%	21.4%	29.4	44.9%	29.5%	25.7%	29.8
Jefferson Twp	8.2%	64.9%	26.9%	31.2	35.7%	49.8%	14.5%	31.2
Lagrange Twp	18.6%	66.5%	14.9%	36.2	19.8%	65.7%	14.5%	32.6
Marcellus	100.0%	0.0%	0.0%	0.3	0.0%	0.0%	100.0%	0.3
Marcellus Twp	24.5%	49.6%	25.9%	15.0	16.8%	49.8%	33.3%	16.2
Mason Twp	6.4%	31.5%	62.1%	20.5	15.3%	14.6%	70.1%	17.3
Milton Twp	31.0%	51.1%	17.9%	27.1	56.4%	33.4%	10.2%	27.6
Newberg Twp	32.1%	49.4%	18.6%	32.3	27.5%	48.5%	24.0%	21.8
Ontwa Twp	23.4%	60.0%	16.7%	23.9	27.4%	32.0%	40.6%	24.2
Penn Twp	16.2%	57.7%	26.0%	29.0	30.6%	39.3%	30.0%	19.1
Pokagon Twp	13.9%	77.2%	8.8%	24.9	17.6%	41.9%	40.6%	24.9
Porter Twp	35.0%	38.1%	26.9%	32.0	25.6%	34.5%	39.9%	31.5
Silver Creek Twp	15.4%	74.9%	9.7%	22.9	19.7%	53.9%	26.3%	22.9
Vandalia	0.0%	100.0%	0.0%	0.4	N/A	N/A	N/A	0.0
Volinia Twp	18.8%	45.8%	35.4%	21.2	0.0%	91.3%	8.7%	12.7
Wayne Twp	13.1%	44.5%	42.4%	20.8	20.2%	54.3%	25.5%	15.8

Cass County Jurisdictions	2 0 0 7				2 0 0 8			
	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	Total Miles Rated	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	Total Miles Rated
Calvin Twp	24.4%	58.8%	16.8%	23.9	0.0%	0.0%	0.0%	0.0
Cassopolis	60.7%	39.3%	0.0%	1.3	60.3%	39.7%	0.0%	1.2
Dowagiac	26.4%	42.1%	31.5%	14.7	39.3%	46.3%	14.4%	14.7
Edwardsburg	56.1%	0.0%	43.9%	0.9	0.0%	0.0%	0.0%	0.0
Howard Twp	25.8%	48.5%	25.6%	29.8	0.0%	0.0%	0.0%	0.0
Jefferson Twp	37.8%	57.4%	4.8%	31.3	0.0%	0.0%	0.0%	0.0
Lagrange Twp	11.1%	69.5%	19.4%	32.7	20.5%	53.8%	25.6%	32.6
Marcellus	0.0%	16.7%	83.3%	0.3	0.0%	15.1%	84.9%	0.3
Marcellus Twp	23.0%	77.0%	0.0%	17.1	20.1%	63.7%	16.2%	16.2
Mason Twp	8.7%	57.1%	34.1%	15.1	0.0%	0.0%	0.0%	0.0
Milton Twp	45.8%	45.8%	8.4%	27.7	0.0%	0.0%	0.0%	0.0
Newberg Twp	0.0%	68.5%	31.5%	21.8	4.6%	39.3%	56.1%	21.8
Ontwa Twp	32.1%	32.5%	35.4%	24.2	0.0%	0.0%	0.0%	0.0
Penn Twp	19.3%	59.4%	21.3%	19.1	27.5%	63.1%	9.4%	19.1
Pokagon Twp	24.0%	35.8%	40.2%	24.9	31.0%	50.5%	18.5%	24.7
Porter Twp	31.6%	25.6%	42.8%	31.5	51.1%	39.1%	9.8%	32.0
Silver Creek Twp	29.5%	66.3%	4.2%	22.9	39.2%	60.8%	0.0%	22.9
Vandalia	N/A	N/A	N/A	0.0	N/A	N/A	N/A	0.0
Volinia Twp	3.9%	92.4%	3.7%	12.7	37.9%	62.1%	0.0%	12.7
Wayne Twp	24.1%	75.9%	0.0%	15.8	30.9%	68.6%	0.5%	15.8

Cass County Jurisdictions	2 0 0 9				2 0 1 0			
	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	Total Miles Rated	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	Total Miles Rated
Calvin Twp	37.7%	62.3%	0.0%	25.8	N/A	N/A	N/A	0.0
Cassopolis	41.3%	58.7%	0.0%	0.4	45.9%	54.1%	0.0%	1.3
Dowagiac	N/A	N/A	N/A	0.0	43.9%	53.3%	2.7%	14.7
Edwardsburg	0.0%	0.0%	100.0%	0.9	N/A	N/A	N/A	0.0
Howard Twp	23.5%	71.8%	4.8%	29.9	N/A	N/A	N/A	0.0
Jefferson Twp	59.3%	40.7%	0.0%	31.3	N/A	N/A	N/A	0.0
Lagrange Twp	74.6%	25.4%	0.0%	4.1	35.9%	57.0%	7.0%	36.2
Marcellus	N/A	N/A	N/A	0.0	0.0%	100.0%	0.0%	0.3
Marcellus Twp	100.0%	0.0%	0.0%	0.9	59.3%	40.7%	0.0%	17.1
Mason Twp	21.6%	42.9%	35.5%	20.5	N/A	N/A	N/A	N/A
Milton Twp	61.4%	36.5%	2.2%	27.7	49.3%	50.7%	0.0%	0.6
Newberg Twp	84.2%	15.8%	0.0%	10.5	26.9%	54.5%	18.5%	32.3
Ontwa Twp	47.6%	32.2%	20.2%	24.1	N/A	N/A	N/A	0.0
Penn Twp	35.0%	65.0%	0.0%	9.9	39.7%	52.2%	8.2%	29.0
Pokagon Twp	0.0%	100.0%	0.0%	0.1	54.0%	40.3%	5.7%	23.8
Porter Twp	100.0%	0.0%	0.0%	0.3	43.3%	48.4%	8.2%	32.0
Silver Creek Twp	N/A	N/A	N/A	0.0	51.1%	44.5%	4.4%	22.9
Vandalia	50.6%	49.4%	0.0%	0.4	0.0%	100.0%	0.0%	0.4
Volinia Twp	41.5%	58.5%	0.0%	8.5	55.9%	44.1%	0.0%	21.2
Wayne Twp	39.9%	60.1%	0.0%	5.0	36.8%	56.2%	7.0%	20.8

Cass County Jurisdictions	2011				2012			
	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	Total Miles Rated	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	Total Miles Rated
Calvin Twp	54.4%	45.6%	0.0%	23.9	N/A	N/A	N/A	0.0
Cassopolis	N/A	N/A	N/A	0.0	45.5%	54.5%	0.0%	1.3
Dowagiac	N/A	N/A	N/A	0.0	40.1%	38.1%	21.8%	14.6
Edwardsburg	0.0%	88.7%	11.3%	0.9	N/A	N/A	N/A	0.0
Howard Twp	55.5%	44.5%	0.0%	30.0	N/A	N/A	N/A	0.0
Jefferson Twp	67.2%	32.8%	0.0%	31.2	N/A	N/A	N/A	0.0
Lagrange Twp	N/A	N/A	N/A	0.0	47.0%	50.8%	2.2%	32.7
Marcellus	N/A	N/A	N/A	0.0	0.0%	0.0%	100%	0.3
Marcellus Twp	N/A	N/A	N/A	0.0	51.9%	25.1%	23.0%	16.2
Mason Twp	22.7%	77.3%	0.0%	15.1	N/A	N/A	N/A	0.0
Milton Twp	74.2%	25.8%	0.0%	27.7	N/A	N/A	N/A	0.0
Newberg Twp	N/A	N/A	N/A	0.0	19.8%	53.1%	27.0%	21.8
Ontwa Twp	62.6%	36.4%	1.0%	24.2	N/A	N/A	N/A	0.0
Penn Twp	N/A	N/A	N/A	0.0	22.7%	56.4%	20.9%	19.1
Pokagon Twp	N/A	N/A	N/A	0.0	52.8%	44.6%	2.5%	24.9
Porter Twp	N/A	N/A	N/A	0.0	26.1%	52.9%	21.0%	31.2
Silver Creek Twp	N/A	N/A	N/A	0.0	52.2%	32.9%	14.9%	22.9
Vandalia	N/A	N/A	N/A	0.0	N/A	N/A	N/A	0.0
Volinia Twp	N/A	N/A	N/A	0.0	56.1%	12.1%	31.8%	12.7
Wayne Twp	N/A	N/A	N/A	0.0	27.8%	67.3%	4.9%	15.0

	2013				2014			
	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	Total Miles Rated	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	Total Miles Rated
Cass County Jurisdictions								
Calvin Twp	50.2%	49.8%	0.0%	23.9	N/A	N/A	N/A	0.0
Cassopolis	N/A	N/A	N/A	0.0	64.9%	35.1%	0.0%	1.2
Dowagiac	N/A	N/A	N/A	0.0	49.5%	38.9%	11.7%	14.6
Edwardsburg	17.1%	82.9%	11.3%	0.9	N/A	N/A	N/A	0.0
Howard Twp	36.8%	62.4%	0.8%	30.0	N/A	N/A	N/A	0.0
Jefferson Twp	67.7%	23.5%	8.9%	31.2	N/A	N/A	N/A	0.0
Lagrange Twp	N/A	N/A	N/A	0.0	65.1%	32.9%	2.0%	32.7
Marcellus	N/A	N/A	N/A	0.0	0.0	100.0%	0.0%	0.3
Marcellus Twp	N/A	N/A	N/A	0.0	67.9%	20.5%	11.6%	16.2
Mason Twp	15.1%	41.9%	43.0%	15.1	N/A	N/A	N/A	0.0
Milton Twp	45.3%	29.7%	25.0%	27.7	N/A	N/A	N/A	0.0
Newberg Twp	N/A	N/A	N/A	0.0	59.9%	31.3%	8.8%	21.8
Ontwa Twp	45.7%	18.0%	36.3%	24.2	N/A	N/A	N/A	0.0
Penn Twp	N/A	N/A	N/A	0.0	57.8%	38.2%	4.0%	19.1
Pokagon Twp	N/A	N/A	N/A	0.0	82.9%	17.1%	0.0%	24.9
Porter Twp	N/A	N/A	N/A	0.0	46.5%	5.7%	47.9%	31.2
Silver Creek Twp	N/A	N/A	N/A	0.0	68.7%	31.3%	0.0%	22.9
Vandalia	N/A	N/A	N/A	0.0	N/A	N/A	N/A	0.0
Volinia Twp	N/A	N/A	N/A	0.0	74.4%	25.6%	0.0%	12.7
Wayne Twp	N/A	N/A	N/A	0.0	54.6%	39.1%	6.2%	15.8

	2015			
	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	Total Miles Rated
Cass County Jurisdictions				
Calvin Twp	81.2%	13.6%	5.2%	23.9
Cassopolis	N/A	N/A	N/A	0.0
Dowagiac	N/A	N/A	N/A	0.0
Edwardsburg	56.1%	43.9%	0.0%	0.9
Howard Twp	62.3%	37.7%	0.0%	30.0
Jefferson Twp	91.1%	5.9%	3.0%	31.2
Lagrange Twp	N/A	N/A	N/A	0.0
Marcellus	N/A	N/A	N/A	0.0
Marcellus Twp	N/A	N/A	N/A	0.0
Mason Twp	44.9%	51.8%	3.3%	15.1
Milton Twp	88.8%	11.2%	0.0%	27.7
Newberg Twp	N/A	N/A	N/A	0.0
Ontwa Twp	64.6%	34.0%	1.4%	24.2
Penn Twp	N/A	N/A	N/A	0.0
Pokagon Twp	N/A	N/A	N/A	0.0
Porter Twp	N/A	N/A	N/A	0.0
Silver Creek Twp	N/A	N/A	N/A	0.0
Vandalia	N/A	N/A	N/A	0.0
Volinia Twp	N/A	N/A	N/A	0.0
Wayne Twp	N/A	N/A	N/A	0.0

	Change from 2003 to 2014/2015			
Cass County Jurisdictions	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	Change in Total Miles Rated
Calvin Twp	74.4%	-32.5%	-41.9%	-1.9
Cassopolis	64.9%	-46.1%	-18.8%	-0.1
Dowagiac	39.5%	-17.1%	-22.3%	0.3
Edwardsburg	44.8%	-8.4%	-36.5%	0.0
Howard Twp	62.3%	-36.4%	-25.9%	2.7
Jefferson Twp	87.9%	-68.3%	-19.6%	0.0
Lagrange Twp	45.5%	-6.1%	-39.4%	-3.4
Marcellus	-78.6%	78.6%	0.0%	0.0
Marcellus Twp	59.9%	-41.6%	-18.3%	1.2
Mason Twp	44.0%	12.2%	-56.2%	-5.4
Milton Twp	84.5%	-62.2%	-22.3%	1.4
Newberg Twp	35.0%	4.8%	-39.8%	-10.5
Ontwa Twp	64.6%	-24.7%	-39.9%	1.3
Penn Twp	39.0%	-15.0%	-24.0%	-9.9
Pokagon Twp	78.0%	-64.9%	-13.1%	0.5
Porter Twp	39.3%	-65.1%	25.8%	-0.8
Silver Creek Twp	50.5%	-7.1%	-43.5%	0.1
Vandalia	N/A	N/A	N/A	-0.4
Volinia Twp	53.2%	-4.0%	-49.2%	-8.5
Wayne Twp	38.0%	2.1%	-40.3%	-4.9

*The total of 2014 and 2015 ratings was used in order to show results for full Federal Aid Eligible network (see page 7 of this report). The figures are color coded. Red typeface indicates deterioration, or an increase in the percentage of poor-condition roads or a decrease in the percentage of good-condition roads, respectively. Green typeface indicates improvement, or respective decreases in poor-condition roads or increases in good-condition roads.

Changes in the percentage of roads in fair condition are not color coded because it is unclear whether those roads changed from fair to good condition or fair to poor condition over the period of analysis.