

The State of Michigan Transportation



2003-2015 PASER Road Survey For Berrien County, Michigan



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

- Last Rating Entered for Every Road in Berrien County (both Federal-Aid and Local)
- PASER Asphalt Rating Chart
- PASER Concrete Rating Chart
- PASER Gravel Rating Chart
- 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 uses the data gathered here to assist member agencies in developing plans for the effective management of their pavement networks.

This report examines changing PASER conditions over the previous 10 years. This is the first report SWMPC has produced that leaves out 2003 data, as 2003 is now outside the ten year time frame. SWMPC is pleased to be in its second decade of conducting these ratings and reporting.

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 Preventative 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 GlobalSat BU-353 Waterproof USB GPS Receiver 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 Technological University'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 (LDC)

Staff Time

For the purposes of this project, a team of three SWMPC staff members was used for collecting and processing the PASER data. Each team member played a separate role during the data collection and processing phase. One individual drove and collaborated in the road rating, a second navigated and entered the road rating into the laptop data collector. Another SWMPC team member loaded data into the SWMPC Roadsoft database and generated reports for submission. PASER-trained staff members of the Berrien County Road Commission and MDOT Coloma Transportation Services Center (now the Kalamazoo Service Group) also participated in determining the ratings, as is required through the statewide data collection process.

Training

All those who were in the vehicle during the rating process attended a daylong training session that took place in Kalamazoo or Grand Rapids. 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.

RESULTS

County-Wide Results

As shown in Figure 1 and Table 1 below, the surface condition of federal aid eligible roads in Berrien County has generally worsened from 2004 through 2015. The percentage of assessed road segments receiving a Good rating of 8-10 has decreased from a high of 38.8% in 2004 to an average of 17.7% in 2012 and 2013. Likewise, the percentage of road segments rated Poor (1-4) grew from a low of 3.5% in 2004 to a high of 49.3% in 2013 and an average of 38.9% in 2012 and 2013. In addition, roads have generally deteriorated from fair condition to poor condition over time. It is worth noting, however, that there was a slight reduction in the percentage of roads in poor condition from 2013 to 2015, reflecting improvements on the same segments of roadway. Still, the percentage of roads in good condition continues to decrease, and the general tran

Figure 1: Percentage of federal-aid eligible road segments falling under each PASER rating classification, by year, 2003-2015 for Berrien County

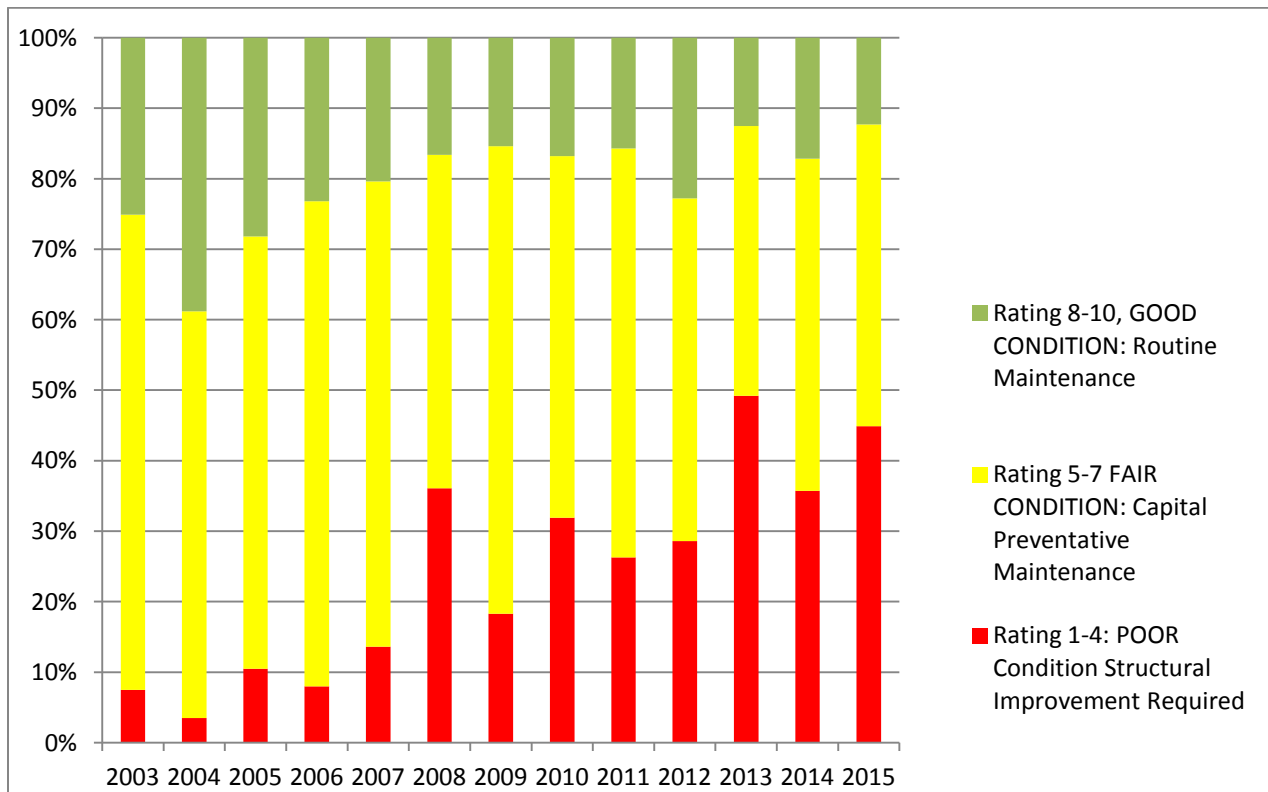


Table 1: Road segment classifications and total road-miles rated, by year

Year	1 to 4 Structural Improvements	5 to 7 Capital Preventive Maintenance	8 to 10 Routine Maintenance	Total	Total Miles Rated
2003	7.5%	67.4%	25.1%	100%	575.3
2004	3.5%	57.7%	38.8%	100%	614.8
2005	10.5%	61.3%	28.2%	100%	723.0
2006	8.0%	68.8%	23.2%	100%	725.5
2007	13.6%	66.0%	20.4%	100%	853.1
2008	36.1%	47.3%	16.6%	100%	441.5
2009	18.3%	66.4%	15.4%	100%	465.4
2010	31.9%	51.3%	16.8%	100%	390.1
2011	26.3%	58.0%	15.7%	100%	376.9
2012	28.6%	48.6%	22.8%	100%	371.8
2013	49.1%	38.2%	12.5%	100%	375.4
2014	35.8%	47.2%	17.2%	100%	373.7
2015	44.9%	42.8%	12.3%	100%	375.6
2003-2004 Totals	5.4%	62.4%	32.2%	100.0%	1190.1
2014-2015 Totals	40.4%	45.0%	14.6%	100.0%	749.3
Change from 03-04 to 14-15	35.0%	-17.4%	-17.6%	--	-440.8

While PASER ratings show a clear downward trend in surface conditions over time, 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 Berrien County. Beginning in 2008, however, the road network was split approximately in half, with the northern half of the county’s federal aid eligible roads assessed on even years and the southern half assessed on odd years. Thus, ratings changes between consecutive years usually 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 2014-2015.

One positive note is that ratings taken in 2013 and 2015 represent ratings taken mostly on the same segments on roadway. They show a slight reduction in the percentage of roads in poor condition and a slight increase in the percentage of roads in fair condition. However, the percentage of roads in good condition has continued to decrease.

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. 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. We encourage all interested individuals to copy and paste these tables into Excel or another data processing package of their choice if you are interested in doing further analysis on the data.

Of the 39 cities, villages, and townships in Berrien County with federal aid eligible roads, 13 have seen the percentage of such road segments in good condition either stay the same or increase. Unfortunately, the number of road segments in disrepair has grown much more quickly; 34 of these jurisdictions have seen the percentage of road segments in poor condition increase or stay the same over the twelve years of analysis.

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. Part of SWMPC's aim in compiling the PASER ratings and publishing an annual report is to promote planning that emphasizes a balance 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

Berrien County Jurisdictions	2003				2004			
	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
Bainbridge Twp	5.7%	72.3%	22.0%	19.0	0.0%	61.2%	38.8%	21.5
Baroda	0.0%	100.0%	0.0%	0.7	0.0%	100.0%	0.0%	0.7
Baroda Twp	0.0%	92.4%	7.6%	19.3	4.4%	56.7%	39.0%	19.6
Benton Harbor	5.6%	78.8%	15.6%	13.0	3.7%	77.4%	18.9%	13.0
Benton Twp	4.0%	68.4%	27.6%	47.9	0.1%	66.5%	33.4%	50.1
Berrien Springs	34.1%	40.9%	25.0%	0.9	0.0%	26.5%	73.5%	0.9
Berrien Twp	10.8%	59.3%	29.9%	31.9	0.0%	30.4%	69.6%	37.3
Bertrand Twp	2.8%	84.7%	12.6%	28.6	4.7%	84.5%	10.9%	34.0
Bridgman	N/A	96.7%	3.3%	3.4	15.1%	78.6%	6.3%	3.4
Buchanan	1.9%	59.3%	38.8%	6.0	2.9%	73.3%	23.8%	4.9
Buchanan Twp	7.3%	43.2%	49.4%	11.5	8.8%	47.8%	43.4%	11.3
Chikaming Twp	0.9%	82.9%	16.2%	16.5	1.2%	70.2%	28.6%	12.9
Coloma	19.0%	50.3%	30.7%	2.7	0.0%	76.6%	23.4%	2.7
Coloma Twp	5.8%	22.4%	71.8%	16.9	0.0%	45.3%	54.7%	21.5
Eau Claire	N/A	N/A	N/A	0	0.0%	100.0%	0.0%	1.1
Galien	0.0%	50.1%	49.9%	0.9	24.7%	50.1%	25.2%	0.9
Galien Twp	24.4%	61.1%	14.5%	21.3	11.8%	69.0%	19.2%	21.3
Hagar Twp	0.0%	98.7%	1.3%	13.0	0.0%	84.5%	15.5%	17.0
Lake Twp	1.5%	77.9%	20.6%	19.1	0.0%	54.8%	45.2%	17.2
Lincoln Twp	0.0%	73.4%	26.6%	19.5	0.0%	53.2%	46.8%	21.2
New Buffalo	0.0%	100.0%	0.0%	2.3	0.0%	86.8%	13.2%	2.3
New Buffalo Twp	15.6%	79.6%	4.8%	33.1	15.0%	75.2%	9.8%	34.2
Niles	0.0%	89.0%	11.0%	15.5	4.2%	68.0%	27.8%	15.6
Niles Twp	5.4%	65.8%	28.8%	47.6	3.6%	43.2%	53.2%	51.6
Oronoko Twp	5.7%	42.8%	51.5%	36.8	0.1%	45.0%	54.8%	38.2
Pipestone Twp	27.7%	42.5%	29.8%	20.2	7.8%	39.2%	52.9%	18.2
Royalton Twp	0.0%	89.8%	10.2%	16.4	0.0%	58.8%	41.2%	19.2
Shoreham	0.0%	100.0%	0.0%	1.2	0.0%	100.0%	0.0%	1.2
Sodus Twp	0.0%	37.0%	63.0%	18.5	0.0%	16.2%	83.8%	28.7
St Joseph	5.6%	71.5%	23.0%	15.2	6.2%	64.5%	29.3%	15.4
St Joseph Twp	0.0%	80.3%	19.7%	12.8	0.0%	75.7%	24.3%	13.0
Stevensville	18.7%	71.7%	9.7%	4.5	18.1%	61.3%	20.6%	4.6
Three Oaks	87.9%	12.1%	0.0%	1.3	92.1%	7.9%	0.0%	1.3
Three Oaks Twp	26.4%	53.4%	20.2%	14.3	6.3%	55.9%	37.8%	15.3
Watervliet	14.3%	63.6%	22.1%	1.4	0.0%	36.6%	63.4%	1.4
Watervliet Twp	3.2%	59.5%	37.3%	16.8	6.0%	63.1%	31.0%	16.7
Weesaw Twp	21.3%	66.8%	11.9%	19.2	0.0%	70.3%	29.7%	19.4

Berrien County Jurisdictions	2005				2006			
	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
Bainbridge Twp	13.8%	54.9%	31.3%	26.9	5.7%	80.8%	13.5%	26.6
Baroda	49.4%	27.7%	22.8%	0.9	0.0%	100.0%	0.0%	0.5
Baroda Twp	16.9%	47.3%	35.8%	24.4	7.7%	51.4%	40.9%	24.3
Benton Harbor	23.4%	71.3%	5.3%	15.5	17.7%	69.2%	13.1%	17.0
Benton Twp	1.5%	71.7%	26.8%	69.2	1.9%	70.6%	27.6%	66.5
Berrien Springs	0.0%	25.0%	75.0%	0.9	42.4%	34.5%	23.1%	2.1
Berrien Twp	0.0%	77.2%	22.8%	37.3	0.0%	88.0%	12.0%	37.2
Bertrand Twp	7.6%	80.0%	12.4%	39.4	11.9%	79.4%	8.7%	38.6
Bridgman	39.5%	56.1%	4.4%	4.9	43.7%	56.3%	0.0%	4.8
Buchanan	2.2%	87.3%	10.6%	6.0	0.0%	89.3%	10.7%	6.0
Buchanan Twp	19.5%	26.8%	53.7%	20	18.2%	71.1%	10.7%	21.5
Chikaming Twp	3.0%	74.8%	22.2%	20	3.1%	68.8%	28.2%	19.7
Coloma	18.2%	32.6%	49.2%	2.7	9.8%	58.8%	31.4%	3.5
Coloma Twp	12.4%	48.6%	39.0%	24.0	8.9%	71.2%	20.0%	23.9
Eau Claire	16.3%	79.6%	4.1%	1.5	0.0%	85.7%	14.3%	1.5
Galien	78.7%	21.3%	0.0%	1.2	64.5%	35.5%	0.0%	1.2
Galien Twp	27.3%	58.8%	13.8%	21.8	25.1%	71.2%	3.7%	21.7
Hagar Twp	0.1%	86.6%	13.3%	17.1	0.0%	87.5%	12.5%	19.0
Lake Twp	5.9%	80.6%	13.4%	22.2	6.2%	93.8%	0.0%	22.2
Lincoln Twp	3.6%	63.5%	32.9%	25.9	0.6%	68.9%	30.4%	27.3
New Buffalo	0.0%	85.9%	14.1%	2.3	0.0%	100.0%	0.0%	2.2
New Buffalo Twp	18.6%	79.8%	1.6%	36.8	16.8%	74.0%	9.2%	36.4
Niles	6.9%	47.8%	45.3%	16.5	6.5%	72.6%	20.9%	16.5
Niles Twp	4.0%	53.5%	42.4%	60.8	0.2%	76.6%	23.2%	60.8
Oronoko Twp	6.7%	58.5%	34.8%	43.0	2.4%	66.1%	31.5%	42.1
Pipestone Twp	23.5%	41.2%	35.3%	23.0	23.1%	37.6%	39.3%	22.9
Royalton Twp	0.0%	63.4%	36.6%	20.2	0.0%	65.8%	34.2%	20.2
Shoreham	100.0%	0.0%	0.0%	1.2	0.0%	0.0%	100.0%	1.2
Sodus Twp	3.0%	20.1%	76.9%	33.3	2.9%	18.0%	79.1%	34.9
St Joseph	29.6%	53.1%	17.3%	17.3	19.2%	52.0%	28.8%	16.1
St Joseph Twp	3.1%	80.7%	16.2%	13.1	2.5%	66.2%	31.3%	13.0
Stevensville	0.0%	71.0%	29.0%	4.6	0.0%	77.4%	22.6%	4.6
Three Oaks	76.2%	0.0%	23.8%	1.3	80.1%	0.0%	19.9%	1.1
Three Oaks Twp	20.4%	50.4%	29.1%	19.6	17.0%	52.1%	30.9%	19.5
Watervliet	1.6%	94.3%	4.2%	2.6	1.5%	71.3%	27.2%	2.8
Watervliet Twp	17.2%	58.5%	24.4%	18.9	9.8%	76.4%	13.8%	19.6
Weesaw Twp	27.5%	62.8%	9.7%	20.5	19.8%	80.2%	0.0%	20.4

Berrien County Jurisdictions	2007				2008			
	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
Bainbridge Twp	8.1%	91.2%	0.7%	33.5	62.6%	33.4%	4.0%	33.6
Baroda	6.1%	58.3%	35.6%	1.3	64.3%	0.0%	35.7%	1.3
Baroda Twp	16.3%	79.2%	4.5%	25.4	N/A	N/A	N/A	0
Benton Harbor	28.5%	56.5%	15.0%	17.3	39.0%	53.8%	7.2%	17.1
Benton Twp	4.3%	75.6%	20.1%	95.8	27.5%	57.7%	14.7%	93.3
Berrien Springs	33.1%	42.9%	24.0%	2.3	N/A	N/A	N/A	0
Berrien Twp	0.3%	72.0%	27.7%	37.4	N/A	N/A	N/A	0
Bertrand Twp	28.7%	61.4%	9.9%	44.1	N/A	N/A	N/A	0
Bridgman	23.4%	76.3%	0.4%	8.1	29.9%	54.5%	15.6%	8.1
Buchanan	16.8%	74.8%	8.4%	6.0	N/A	N/A	N/A	0
Buchanan Twp	20.3%	61.5%	18.3%	24.4	N/A	N/A	N/A	0
Chikaming Twp	7.1%	91.0%	1.8%	36.6	N/A	N/A	N/A	0
Coloma	18.5%	39.0%	42.5%	3.6	38.1%	22.4%	39.5%	3.6
Coloma Twp	22.1%	54.3%	23.6%	25.6	37.8%	46.7%	15.4%	25.5
Eau Claire	0.0%	89.8%	10.2%	1.5	N/A	N/A	N/A	0
Galien	64.8%	35.2%	0.0%	1.2	N/A	N/A	N/A	0
Galien Twp	7.8%	68.1%	24.0%	21.8	N/A	N/A	N/A	0
Hagar Twp	6.2%	90.6%	3.2%	34.7	19.8%	78.8%	1.4%	34.6
Lake Twp	10.5%	89.5%	0.0%	33.3	42.0%	57.7%	0.3%	33.3
Lincoln Twp	1.5%	69.6%	28.9%	35.3	27.6%	57.5%	14.9%	36.2
New Buffalo	23.8%	43.3%	32.9%	2.3	N/A	N/A	N/A	0
New Buffalo Twp	32.7%	41.5%	25.8%	41.8	N/A	N/A	N/A	0
Niles	7.0%	80.1%	12.9%	16.7	N/A	N/A	N/A	0
Niles Twp	0.3%	61.2%	38.5%	62.7	N/A	N/A	N/A	0
Oronoko Twp	6.8%	55.3%	37.9%	44.5	N/A	N/A	N/A	0
Pipestone Twp	25.2%	72.9%	1.9%	26.0	65.4%	9.2%	25.4%	26.0
Royalton Twp	7.0%	82.4%	10.5%	20.4	46.7%	46.9%	6.4%	20.4
Shoreham	0.0%	100.0%	0.0%	1.2	100.0%	0.0%	0.0%	1.2
Sodus Twp	5.0%	21.3%	73.7%	39.9	27.7%	15.6%	56.7%	39.9
St Joseph	14.9%	57.6%	27.5%	18.4	28.4%	53.1%	18.5%	18.4
St Joseph Twp	10.4%	62.4%	27.2%	14.3	21.9%	62.7%	15.4%	14.3
Stevensville	5.5%	69.7%	24.8%	4.6	37.6%	50.7%	11.7%	4.6
Three Oaks	76.2%	0.0%	23.8%	1.3	N/A	N/A	N/A	0
Three Oaks Twp	31.3%	48.9%	19.8%	19.6	N/A	N/A	N/A	0
Watervliet	0.0%	65.5%	34.5%	2.8	40.3%	43.4%	16.3%	2.3
Watervliet Twp	34.5%	49.7%	15.7%	21.0	43.3%	39.8%	17.0%	21.7
Weesaw Twp	38.7%	60.7%	0.6%	20.5	N/A	N/A	N/A	0

Berrien County Jurisdictions	2009				2010			
	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
Bainbridge Twp	N/A	N/A	N/A	0	62.6%	36.5%	0.9%	32.3
Baroda	62.1%	N/A	37.9%	1.2	100.0%	0.0%	0.0%	0.1
Baroda Twp	18.1%	77.9%	4.0%	25.4	N/A	N/A	N/A	0
Benton Harbor	N/A	N/A	N/A	0	39.6%	36.9%	23.5%	17.4
Benton Twp	N/A	N/A	N/A	0	31.5%	57.2%	11.3%	94.3
Berrien Springs	22.5%	36.0%	41.5%	2.3	N/A	N/A	N/A	0
Berrien Twp	19.2%	71.8%	9.0%	40.3	N/A	N/A	N/A	0
Bertrand Twp	20.2%	60.4%	19.5%	44.1	N/A	N/A	N/A	0
Bridgman	14.4%	58.8%	26.8%	8.1	N/A	N/A	N/A	0
Buchanan	31.1%	50.4%	18.5%	6.0	N/A	N/A	N/A	0
Buchanan Twp	14.0%	66.0%	19.9%	25.7	N/A	N/A	N/A	0
Chikaming Twp	6.4%	74.5%	19.1%	36.6	N/A	N/A	N/A	0
Coloma	N/A	N/A	N/A	0	62.0%	38.0%	0.0%	3.6
Coloma Twp	N/A	N/A	N/A	0	13.6%	63.9%	22.5%	20.5
Eau Claire	N/A	N/A	N/A	0	31.3%	68.7%	0.0%	1.5
Galien	64.8%	35.2%	0.0%	1.2	N/A	N/A	N/A	0
Galien Twp	42.2%	30.1%	27.7%	21.8	N/A	N/A	N/A	0
Hagar Twp	N/A	N/A	N/A	0	21.1%	56.1%	22.8%	28.8
Hartford Twp	0.0%	100.0%	0.0%	2.7	100.0%	0.0%	0.0%	2.7
Keeler Twp	0.0%	100.0%	0.0%	3.3	100.0%	0.0%	0.0%	3.3
Lake Twp	6.2%	81.5%	12.3%	33.3	0.0%	0.0%	100.0%	0.3
Lincoln Twp	N/A	N/A	N/A	0	22.2%	64.0%	13.8%	34.7
New Buffalo	20.3%	79.7%	0.0%	2.3	N/A	N/A	N/A	0
New Buffalo Twp	2N/A	50.3%	29.6%	41.8	N/A	N/A	N/A	0
Niles	20.9%	73.8%	5.3%	16.7	0.0%	0.0%	100.0%	0.2
Niles Twp	13.9%	74.4%	11.7%	62.7	N/A	N/A	N/A	0
Oronoko Twp	10.3%	74.8%	14.9%	44.5	N/A	N/A	N/A	0
Pipestone Twp	0.0%	100.0%	0.0%	0.1	59.5%	36.3%	4.2%	25.9
Royalton Twp	N/A	N/A	N/A	0	22.2%	73.6%	4.2%	17.8
Shoreham	N/A	N/A	N/A	0	0.0%	100.0%	0.0%	1.2
Sodus Twp	N/A	N/A	N/A	0	20.5%	22.5%	57.0%	39.9
St Joseph	N/A	N/A	N/A	0	20.3%	66.0%	13.8%	19.4
St Joseph Twp	N/A	N/A	N/A	0	7.2%	58.7%	34.1%	14.3
Stevensville	N/A	N/A	N/A	0	36.4%	52.1%	11.6%	4.6
Three Oaks	76.2%	23.8%	0.0%	1.3	N/A	N/A	N/A	0
Three Oaks Twp	38.3%	51.5%	10.2%	19.6	N/A	N/A	N/A	0
Watervliet	N/A	N/A	N/A	0	44.6%	48.8%	6.6%	3.5
Watervliet Twp	N/A	N/A	N/A	0	25.8%	70.8%	3.4%	22.6
Weesaw Twp	29.8%	61.2%	8.9%	24.5	0.0%	0.0%	100.0%	0.4

Berrien 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
Bainbridge Twp	N/A	N/A	N/A	0.0	39.8%	27.3%	32.9%	28.1
Baroda	26.2%	61.3%	12.5%	0.6	N/A	N/A	N/A	0.0
Baroda Twp	6.6%	81.5%	11.9%	15.0	N/A	N/A	N/A	0.0
Benton Harbor	N/A	N/A	N/A	0.0	43.8%	28.2%	28.0%	17.6
Benton Twp	N/A	N/A	N/A	0.0	40.5%	51.0%	8.6%	93.9
Berrien Springs	19.6%	44.2%	36.1%	2.3	N/A	N/A	N/A	0.0
Berrien Twp	25.1%	58.5%	16.4%	34.2	N/A	N/A	N/A	0.0
Bertrand Twp	25.4%	54.0%	20.6%	41.7	N/A	N/A	N/A	0.0
Bridgman	33.1%	40.0%	26.9%	8.1	N/A	N/A	N/A	0.0
Buchanan	34.7%	62.8%	2.5%	6.1	N/A	N/A	N/A	0.0
Buchanan Twp	41.2%	57.6%	1.2%	18.8	N/A	N/A	N/A	0.0
Chikaming Twp	15.6%	60.7%	23.6%	35.2	N/A	N/A	N/A	0.0
Coloma	N/A	N/A	N/A	0.0	50.8%	41.2%	8.0%	3.6
Coloma Twp	N/A	N/A	N/A	0.0	19.3%	65.0%	15.7%	23.6
Eau Claire	12.4%	33.3%	54.3%	1.5	45.7%	0.0%	54.3%	1.5
Galien	18.8%	40.8%	40.4%	1.0	N/A	N/A	N/A	0.0
Galien Twp	41.5%	3.0%	55.4%	10.8	N/A	N/A	N/A	0.0
Hagar Twp	N/A	N/A	N/A	0.0	32.2%	61.9%	5.8%	31.5
Hartford Twp	N/A	N/A	N/A	0.0	N/A	N/A	N/A	0.0
Keeler Twp	N/A	N/A	N/A	0.0	N/A	N/A	N/A	0.0
Lake Twp	39.6%	55.2%	5.2%	20.6	N/A	N/A	N/A	0.0
Lincoln Twp	N/A	N/A	N/A	0.0	46.1%	47.1%	6.7%	36.3
New Buffalo	20.3%	79.7%	0.0%	2.3	N/A	N/A	N/A	0.0
New Buffalo Twp	19.2%	61.6%	19.3%	34.6	N/A	N/A	N/A	0.0
Niles	50.1%	38.3%	11.6%	16.7	N/A	N/A	N/A	0.0
Niles Twp	26.7%	70.6%	2.8%	60.3	N/A	N/A	N/A	0.0
Oronoko Twp	7.6%	72.2%	20.3%	34.7	N/A	N/A	N/A	0.0
Pipestone Twp	N/A	N/A	N/A	0.0	50.0%	7.3%	42.7%	16.8
Royalton Twp	N/A	N/A	N/A	0.0	37.7%	56.9%	5.4%	18.4
Shoreham	N/A	N/A	N/A	0.0	N/A	N/A	N/A	0.0
Sodus Twp	N/A	N/A	N/A	0.0	12.6%	36.2%	51.2%	1.2
St Joseph	N/A	N/A	N/A	0.0	33.8%	30.1%	36.1%	19.4
St Joseph Twp	N/A	N/A	N/A	0.0	16.2%	68.9%	14.9%	15.1
Stevensville	N/A	N/A	N/A	0.0	79.1%	9.6%	11.3%	4.6
Three Oaks	40.5%	27.6%	31.9%	1.3	N/A	N/A	N/A	0.0
Three Oaks Twp	18.6%	43.2%	38.3%	11.5	N/A	N/A	N/A	0.0
Watervliet	N/A	N/A	N/A	0.0	29.2%	15.3%	55.5%	3.5
Watervliet Twp	N/A	N/A	N/A	0.0	3.4%	88.4%	8.2%	20.3
Weesaw Twp	53.0%	42.2%	4.9%	19.8	N/A	N/A	N/A	0.0

Berrien County Jurisdictions	2013				2014			
	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	Total Miles Rated	Struc. Impr. (1-4)	Cap. Prev. (5-7)	Rout. Maint. (8-10)	Total Miles Rated
Bainbridge Twp	N/A	N/A	N/A	0.0	46.6%	45.3%	8.1%	28.1
Baroda	0.0%	69.4%	30.6%	0.5	100.0%	0.0%	0.0%	0.1
Baroda Twp	57.0%	36.3%	6.7%	15.0	N/A	N/A	N/A	0
Benton Harbor	N/A	N/A	N/A	0.0	51.4%	29.8%	18.8%	17.6
Benton Twp	N/A	N/A	N/A	0.0	37.7%	51.1%	11.2%	93.9
Berrien Springs	26.6%	45.6%	27.8%	2.3	0.0%	0.0%	100.0%	0.3
Berrien Twp	56.9%	41.4%	1.7%	34.2	N/A	N/A	N/A	0.0
Bertrand Twp	40.1%	28.6%	31.3%	41.7	N/A	N/A	N/A	0.0
Bridgman	56.2%	23.9%	19.9%	8.1	N/A	N/A	N/A	0.0
Buchanan	54.5%	45.5%	0.0%	6.1	N/A	N/A	N/A	0.0
Buchanan Twp	57.9%	33.9%	8.2%	18.8	N/A	N/A	N/A	0.0
Chikaming Twp	43.0%	39.1%	17.9%	35.2	N/A	N/A	N/A	0.0
Coloma	N/A	N/A	N/A	0.0	57.3%	42.7%	0.0%	3.6
Coloma Twp	N/A	N/A	N/A	0.0	15.4%	43.3%	41.3%	23.6
Eau Claire	N/A	N/A	N/A	0.0	41.2%	58.8%	0.0%	1.5
Galien	4.9%	93.5%	1.6%	0.7	100.0%	0.0%	0.0%	0.2
Galien Twp	44.1%	55.9%	0.0%	10.8	N/A	N/A	N/A	0.0
Hagar Twp	N/A	N/A	N/A	0.0	35.6%	34.0%	30.5%	31.5
Lake Twp	64.1%	11.7%	24.2%	20.6	N/A	N/A	N/A	0.0
Lincoln Twp	N/A	N/A	N/A	0.0	43.4%	51.1%	5.5%	38.3
New Buffalo	27.5%	26.9%	45.6%	2.3	N/A	N/A	N/A	0.0
New Buffalo Twp	30.5%	46.7%	22.8%	34.6	N/A	N/A	N/A	0.0
Niles	65.1%	34.9%	0.0%	16.7	N/A	N/A	N/A	0.0
Niles Twp	52.4%	47.6%	0.0%	60.3	N/A	N/A	N/A	0.0
Oronoko Twp	37.6%	41.6%	20.8%	34.7	N/A	N/A	N/A	0.0
Pipestone Twp	N/A	N/A	N/A	0.0	70.7%	29.3%	0.0%	16.0
Royalton Twp	N/A	N/A	N/A	0.0	29.2%	70.8%	0.0%	18.4
Shoreham	N/A	N/A	N/A	0.0	0.0%	100.0%	0.0%	1.2
Sodus Twp	N/A	N/A	N/A	0.0	33.5%	15.9%	50.6%	36.5
St Joseph	N/A	N/A	N/A	0.0	28.5%	55.6%	16.0%	19.3
St Joseph Twp	N/A	N/A	N/A	0.0	12.2%	83.0%	4.7%	15.1
Stevensville	N/A	N/A	N/A	0.0	56.4%	35.1%	8.5%	4.6
Three Oaks	12.1%	11.6%	76.2%	1.3	N/A	N/A	N/A	0.0
Three Oaks Twp	22.0%	75.0%	3.0%	11.5	N/A	N/A	N/A	0.0
Watervliet	N/A	N/A	N/A	0.0	15.0%	47.4%	37.6%	3.5
Watervliet Twp	N/A	N/A	N/A	0.0	11.6%	76.7%	11.7%	20.3
Weesaw Twp	89.1%	10.9%	0.0%	19.8	N/A	N/A	N/A	0.0

Berrien County Jurisdictions	2015			
	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	Total Miles Rated
Bainbridge Twp	N/A	N/A	N/A	0.0
Baroda	0.0%	100.0%	0.0%	0.5
Baroda Twp	65.9%	21.2%	12.9%	15.0
Benton Harbor	N/A	N/A	N/A	0.0
Benton Twp	N/A	N/A	N/A	0.0
Berrien Springs	25.5%	52.0%	22.5%	2.3
Berrien Twp	36.5%	50.7%	12.7%	34.3
Bertrand Twp	37.7%	48.3%	14.0%	41.7
Bridgman	43.4%	16.5%	40.1%	8.1
Buchanan	86.1%	3.8%	10.1%	6.1
Buchanan Twp	45.6%	33.3%	21.0%	18.8
Chikaming Twp	62.0%	35.4%	2.6%	35.2
Coloma	N/A	N/A	N/A	0.0
Coloma Twp	N/A	N/A	N/A	0.0
Eau Claire	N/A	N/A	N/A	0.0
Galien	50.5%	49.5%	0.0%	0.8
Galien Twp	41.5%	58.5%	0.0%	10.8
Hagar Twp	N/A	N/A	N/A	0.0
Lake Twp	64.8%	23.6%	11.6%	20.6
Lincoln Twp	N/A	N/A	N/A	0.0
New Buffalo	0.0%	66.4%	33.6%	2.3
New Buffalo Twp	54.5%	38.2%	7.4%	34.5
Niles	64.7%	29.6%	5.7%	16.7
Niles Twp	25.9%	59.7%	14.4%	60.3
Oronoko Twp	30.0%	54.4%	15.6%	34.7
Pipestone Twp	N/A	N/A	N/A	0.0
Royalton Twp	N/A	N/A	N/A	0.0
Shoreham	N/A	N/A	N/A	0.0
Sodus Twp	N/A	N/A	N/A	0.0
St Joseph	N/A	N/A	N/A	0.0
St Joseph Twp	N/A	N/A	N/A	0.0
Stevensville	N/A	N/A	N/A	0.0
Three Oaks	12.4%	47.2%	40.4%	1.3
Three Oaks Twp	45.7%	43.4%	10.9%	11.5
Watervliet	N/A	N/A	N/A	0.0
Watervliet Twp	N/A	N/A	N/A	0.0
Weesaw Twp	58.8%	28.5%	12.7%	19.8

Berrien County Jurisdictions	Change from 2003 to 2014-2015 Total*			Change in Total Miles Rated
	Struc. Impr. (1 to 4)	Cap. Prev. (5 to 7)	Rout. Maint. (8 to 10)	
Bainbridge Twp	40.9%	-27.0%	-13.9%	0.0
Baroda	0.0%	0.0%	0.0%	-0.2
Baroda Twp	65.9%	-71.2%	5.3%	-4.3
Benton Harbor	45.8%	-49.0%	3.2%	0.3
Benton Twp	33.7%	-17.3%	-16.4%	5.8
Berrien Springs	-8.6%	11.1%	-2.5%	1.4
Berrien Twp	25.7%	-8.6%	-17.2%	2.4
Bertrand Twp	34.9%	-36.4%	1.4%	13.1
Bridgman	43.4%	-80.2%	36.8%	4.7
Buchanan	84.2%	-55.5%	-28.7%	0.1
Buchanan Twp	38.3%	-9.9%	-28.4%	7.3
Chikaming Twp	61.1%	-47.5%	-13.6%	18.7
Coloma	38.3%	-7.6%	-30.7%	0.9
Coloma Twp	9.6%	20.9%	-30.5%	0.0
Eau Claire	41.2%	-41.2%	0.0%	1.5
Galien	50.5%	-0.6%	-49.9%	-0.1
Galien Twp	17.1%	-2.6%	-14.5%	-10.5
Hagar Twp	35.6%	-64.7%	29.2%	0.1
Lake Twp	63.3%	-54.3%	-9.0%	-0.3
Lincoln Twp	43.4%	-22.3%	-21.1%	0.1
New Buffalo	0.0%	-33.6%	33.6%	0
New Buffalo Twp	38.9%	-41.4%	2.6%	1.4
Niles	64.7%	-59.4%	-5.3%	1.2
Niles Twp	20.5%	-6.1%	-14.4%	12.7
Oronoko Twp	24.3%	11.6%	-35.9%	-2.1
Pipestone Twp	43.0%	-13.2%	-29.8%	1.8
Royalton Twp	29.2%	-19.0%	-10.2%	0.0
Shoreham	0.0%	0.0%	0.0%	0.0
Sodus Twp	33.5%	-21.1%	-12.4%	13.0
St Joseph	22.9%	-15.9%	-7.0%	0.0
St Joseph Twp	12.2%	2.7%	-15.0%	0.2
Stevensville	37.7%	-36.6%	-1.2%	0.1
Three Oaks	-75.5%	35.1%	40.4%	0.0
Three Oaks Twp	19.3%	-10.0%	-9.3%	-2.8
Watervliet	0.7%	-16.2%	15.5%	0.6
Watervliet Twp	8.4%	17.2%	-25.6%	0.1
Weesaw Twp	37.5%	-38.3%	0.8%	0.0

*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). Red shading indicates deterioration, or an increase in the percentage of poor-condition roads or a decrease in the percentage of good-condition roads, respectively. Green indicates improvement, or respective decreases in poor-condition roads or increases in good-condition roads. Fair roads are not color coded because in almost every case, it is

unclear whether fair roads were improved to be in good condition or deteriorated to be in fair condition.