

The State of Michigan Transportation



# **2003-2009 PASER Road Survey**

## **For Berrien County, Michigan**



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## PROJECT OVERVIEW

Over the course of 2003 to 2009 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) together assessed the condition of the southwest region's federal aid eligible roads. To do this, the Pavement Surface Evaluation and Rating (PASER) system was used as the tool for road ratings. The effort was funded and administered through the State of Michigan Asset Management Council.

According to the new Governmental Accounting Standards Board Statement 34 (GASB 34), governmental units receiving, or applying for federal money must assess the condition of their roads at least once every three years. This project has laid the foundation to meet the requirements of GASB 34 and continues to demonstrate that it can be accomplished with minimal staff in a relatively short period of time.

## METHODOLOGY: THE PASER ROAD RATING SYSTEM

PASER, or Pavement Surface Evaluation and Rating, is a method of rating roads that utilizes a ten-point scale. It is a visual test of the surface condition of the road. Structural or geometric defects are not considered in the determination of the ratings. Roads are rated in segments of varying length depending on the road. A segment value of ten represents a new road segment. A segment value of one represents a failed road segment. Various types of defects are considered during the visual analysis and aggregated to arrive at an overall score for the road segment. Teams of three to four individuals collaborated on the PASER windshield survey as they drove the region's road network. 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

a ten-point scale. It is a visual test of the surface condition of the road. Structural or geometric defects are not considered in the determination of the ratings. Roads are rated in segments of varying length depending on the road. A segment value of ten represents a new road segment. A segment value of one represents a failed road segment. Various types of defects are considered during the visual analysis and aggregated to arrive at an overall score for the road segment. Teams of three to four individuals collaborated on the PASER windshield survey as they drove the region's road network. PASER rating charts for asphalt, concrete, and gravel roads have been included in the

The PASER road rating system was developed by the University of Wisconsin-Madison Transportation Information Center to be used as the State of Wisconsin's standard road rating system.

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 is the day-to-day maintenance activities that are scheduled, 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 preserves, retards future deterioration, and maintains or improves 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. Surface 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, which address 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.

### **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 of village, a fourth member would be added from that city of 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) present. Several cities and villages also participated in the project. On average, 628 of Federal Aid Eligible road were rated each year in Berrien County.

### **Training**

All participants in the survey were required to attend a daylong training session that took place at either the Coloma TSC or the Kalamazoo Area Transportation Study. 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. Most participants felt comfortable after an hour of working the computer and rating the roads.

## RESULTS

Following are the findings for Berrien County for each year from 2003 to 2009.

**2003 Results, Berrien County:** Approximately 575 miles of federal aid eligible roads were rated in 2003 for this project.

- 25 percent of the roads surveyed received a grade of 8 or above,
- 67 percent of the roads surveyed received a grade of 5, 6, or 7
- 8 percent of the roads surveyed received a rating of 4 or less.

**2004 Results, Berrien County:** Approximately 615 miles of federal aid eligible roads were rated in 2004 for this project.

- 39 percent of the roads surveyed received a grade of 8 or above,
- 58 percent of the roads surveyed received a grade of 5, 6, or 7
- 4 percent of the roads surveyed received a rating of 4 or less.

**2005 Results, Berrien County:** Approximately 723 miles of federal aid eligible roads were rated in 2005 for this project.

- 28 percent of the roads surveyed received a grade of 8 or above,
- 61 percent of the roads surveyed received a grade of 5, 6, or 7
- 10 percent of the roads surveyed received a rating of 4 or less.

**2006 Results, Berrien County:** Approximately 726 miles of federal aid eligible roads were rated in 2006 for this project.

- 23 percent of the roads surveyed received a grade of 8 or above,
- 69 percent of the roads surveyed received a grade of 5, 6, or 7
- 8 percent of the roads surveyed received a rating of 4 or less.

**2007 Results, Berrien County:** Approximately 853 miles of federal aid eligible roads were rated in 2007 for this project.

- 20 percent of the roads surveyed received a grade of 8 or above,
- 66 percent of the roads surveyed received a grade of 5, 6, or 7
- 14 percent of the roads surveyed received a rating of 4 or less.

**2008 Results, Berrien County:** Approximately 442 miles of federal aid eligible roads were rated in 2008 for this project.

- 17 percent of the roads surveyed received a grade of 8 or above,
- 47 percent of the roads surveyed received a grade of 5, 6, or 7
- 36 percent of the roads surveyed received a rating of 4 or less.

**2009 Results, Berrien County:** Approximately 465 miles of federal aid eligible roads were rated in 2009 for this project.

- 15 percent of the roads surveyed received a grade of 8 or above,
- 66 percent of the roads surveyed received a grade of 5, 6, or 7
- 18 percent of the roads surveyed received a rating of 4 or less.

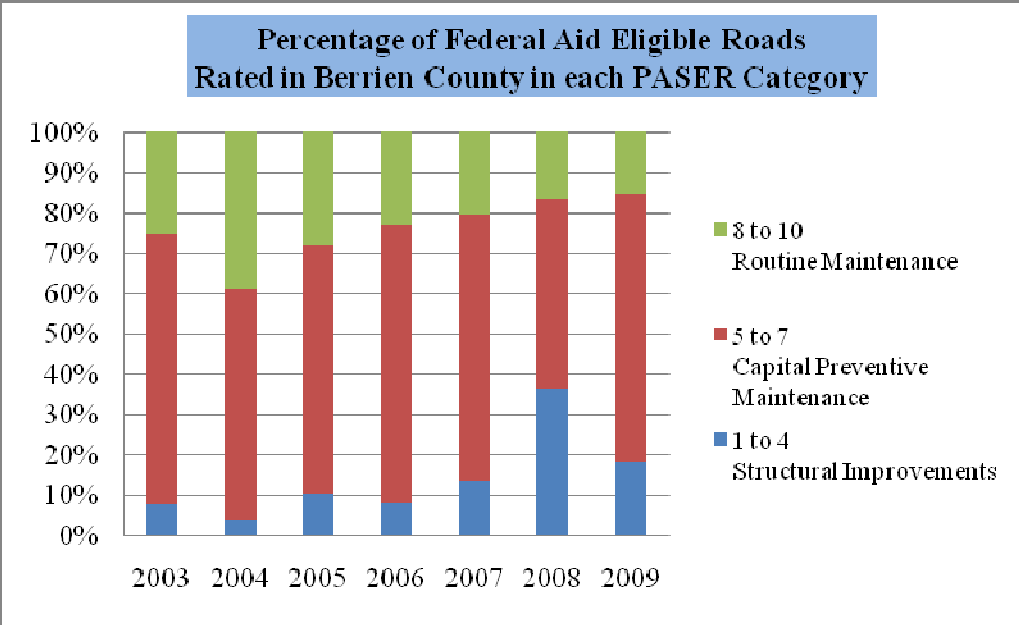
### **Summary: Comparison 2003 through 2009**

The following considerations should be noted when making comparisons between PASER rating years 2003 through 2009 in Berrien County:

- The number of federal aid eligible roads that were rated each year in Berrien County ranged from 442 to 853 miles.
- Because of this wide range it is difficult to make comparisons between years of the number of miles that were rated in a particular category. For this reason the below chart and tables show the percentages of miles rated that fell within each category.
- From 2003 to 2009, the percentage of miles rated in the PASER Rating Category of 8 to 10 decreased by 9.7 percent. This means that Berrien County's proportion of roads that are in good condition, needing only routine maintenance, has gone down.
- From 2003 to 2009, the percentage of miles rated in the PASER Rating Category of 5 to 7 stayed fairly consistent, decreasing by one percent.
- From 2003 to 2009, the percentage of miles rated in the PASER Rating Category of 1 to 4 increased by 10.7 percent. This means that Berrien County's proportion of roads that are in poor condition and require structural improvements has increased.

The following chart and table compare the percentages of federal aid eligible roads rated in each PASER category by year from 2003 to 2009.





**Percentage of Federal Aid Eligible Roads  
Rated in Berrien County in each PASER Category**

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%	100.0%	575.3
2004	3.5%	57.7%	38.8%	100.0%	614.8
2005	10.5%	61.3%	28.2%	100.0%	723.0
2006	8.0%	68.8%	23.2%	100.0%	725.5
2007	13.6%	66.0%	20.4%	100.0%	853.1
2008	36.1%	47.3%	16.6%	100.0%	441.5
2009	18.3%	66.4%	15.4%	100.0%	465.4
<b>Percentage Changed from 2003 to 2009</b>	10.7%	-1.0%	-9.7%		

Because some cities and townships in Berrien County had road ratings done in some years and not others, it may be an over-generalization to analyze the trends from year to year for all roads in Berrien County as an aggregate. That is to say that it may not be a fair comparison from year to year, since each year not all of the same roads were rated. The tables on the following pages disaggregate the data by city or township for each year.



The following table summarizes the PASER ratings and amount of miles rated for each of the jurisdictions represented in the county PASER road-rating project. This table is also available as a separate document at [http://swmpc.org/asset\\_mgmt\\_b.asp](http://swmpc.org/asset_mgmt_b.asp).

The last section in the table gives the change in the percentage of roads rated in each category from 2003 to 2009 (or from 2003 to 2008 if that city or township did not have any roads rated in 2009). This change illustrates the increase or decrease in condition of the roads rated for that city or township over time. The trends in each jurisdiction vary dramatically; some showed an improvement in road ratings over time and others showed a decline. The accuracy of these trends is also dependent upon whether the roads rated are representative of all of the roads in that jurisdiction. Some jurisdictions had as few as 0.7 miles of road rated in any given year.

### Percentage of Federal Aid Eligible Roads in Each PASER Category By Jurisdiction

Berrien 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
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	0.0%	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	0.0%	0.0%	0.0%	0.0	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
Hartford Twp	0.7%	99.3%	0.0%	2.7	0.0%	62.9%	37.1%	2.7
Keeler Twp	0.0%	100.0%	0.0%	3.3	0.0%	72.7%	27.3%	3.3
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	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
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%	20.0	18.2%	71.1%	10.7%	21.5
Chikaming Twp	3.0%	74.8%	22.2%	20.0	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
Hartford Twp	0.0%	99.3%	0.7%	2.7	0.0%	100.0%	0.0%	2.7
Keeler Twp	0.0%	100.0%	0.0%	3.3	0.0%	58.4%	41.6%	3.3
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	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
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	0.0%	0.0%	0.0%	0.0
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	0.0%	0.0%	0.0%	0.0
Berrien Twp	0.3%	72.0%	27.7%	37.4	0.0%	0.0%	0.0%	0.0
Bertrand Twp	28.7%	61.4%	9.9%	44.1	0.0%	0.0%	0.0%	0.0
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	0.0%	0.0%	0.0%	0.0
Buchanan Twp	20.3%	61.5%	18.3%	24.4	0.0%	0.0%	0.0%	0.0
Chikaming Twp	7.1%	91.0%	1.8%	36.6	0.0%	0.0%	0.0%	0.0
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	0.0%	0.0%	0.0%	0.0
Galien	64.8%	35.2%	0.0%	1.2	0.0%	0.0%	0.0%	0.0
Galien Twp	7.8%	68.1%	24.0%	21.8	0.0%	0.0%	0.0%	0.0
Hagar Twp	6.2%	90.6%	3.2%	34.7	19.8%	78.8%	1.4%	34.6
Hartford Twp	78.4%	21.6%	0.0%	2.7	56.0%	44.0%	0.0%	2.7
Keeler Twp	100.0%	0.0%	0.0%	3.3	0.0%	0.0%	100.0%	3.3
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	0.0%	0.0%	0.0%	0.0
New Buffalo Twp	32.7%	41.5%	25.8%	41.8	0.0%	0.0%	0.0%	0.0
Niles	7.0%	80.1%	12.9%	16.7	0.0%	0.0%	0.0%	0.0
Niles Twp	0.3%	61.2%	38.5%	62.7	0.0%	0.0%	0.0%	0.0
Oronoko Twp	6.8%	55.3%	37.9%	44.5	0.0%	0.0%	0.0%	0.0
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	0.0%	0.0%	0.0%	0.0
Three Oaks Twp	31.3%	48.9%	19.8%	19.6	0.0%	0.0%	0.0%	0.0
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	0.0%	0.0%	0.0%	0.0

Berrien County Jurisdictions	2 0 0 9				Percentage Changed from 2003 to 2009*			
	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	0.0%	0.0%	0.0%	0.0	56.9%	-38.9%	-18.0%	161.3
Baroda	62.1%	0.0%	37.9%	1.2	62.1%	-100.0%	37.9%	6.7
Baroda Twp	18.1%	77.9%	4.0%	25.4	18.1%	-14.5%	-3.6%	138.4
Benton Harbor	0.0%	0.0%	0.0%	0.0	33.4%	-25.1%	-8.3%	92.9
Benton Twp	0.0%	0.0%	0.0%	0.0	23.5%	-10.7%	-12.8%	422.8
Berrien Springs	22.5%	36.0%	41.5%	2.3	-11.6%	-4.9%	16.5%	9.2
Berrien Twp	19.2%	71.8%	9.0%	40.3	8.4%	12.5%	-20.9%	221.4
Bertrand Twp	20.2%	60.4%	19.5%	44.1	17.4%	-24.3%	6.9%	228.9
Bridgman	14.4%	58.8%	26.8%	8.1	14.4%	-37.9%	23.5%	40.9
Buchanan	31.1%	50.4%	18.5%	6.0	29.2%	-8.8%	-20.3%	34.9
Buchanan Twp	14.0%	66.0%	19.9%	25.7	6.7%	22.8%	-29.5%	114.4
Chikaming Twp	6.4%	74.5%	19.1%	36.6	5.5%	-8.4%	2.9%	142.3
Coloma	0.0%	0.0%	0.0%	0.0	19.1%	-27.9%	8.8%	18.8
Coloma Twp	0.0%	0.0%	0.0%	0.0	32.0%	24.3%	-56.4%	137.3
Eau Claire	0.0%	0.0%	0.0%	0.0	0.0%	0.0%	0.0%	5.5
Galien	64.8%	35.2%	0.0%	1.2	64.8%	-14.9%	-49.9%	6.6
Galien Twp	42.2%	30.1%	27.7%	21.8	17.8%	-31.0%	13.1%	129.7
Hagar Twp	0.0%	0.0%	0.0%	0.0	19.8%	-19.9%	0.2%	135.5
Hartford Twp	0.0%	100.0%	0.0%	2.7	-0.7%	0.7%	0.0%	18.8
Keeler Twp	0.0%	100.0%	0.0%	3.3	0.0%	0.0%	0.0%	23.0
Lake Twp	6.2%	81.5%	12.3%	33.3	4.7%	3.6%	-8.3%	180.6
Lincoln Twp	0.0%	0.0%	0.0%	0.0	27.6%	-15.9%	-11.7%	165.5
New Buffalo	20.3%	79.7%	0.0%	2.3	20.3%	-20.3%	0.0%	13.4
New Buffalo Twp	20.0%	50.3%	29.6%	41.8	4.4%	-29.2%	24.8%	224.1
Niles	20.9%	73.8%	5.3%	16.7	20.9%	-15.1%	-5.8%	97.4
Niles Twp	13.9%	74.4%	11.7%	62.7	8.5%	8.6%	-17.1%	346.2
Oronoko Twp	10.3%	74.8%	14.9%	44.5	4.6%	32.0%	-36.6%	249.1
Pipestone Twp	0.0%	100.0%	0.0%	0.1	-27.7%	57.5%	-29.8%	136.4
Royalton Twp	0.0%	0.0%	0.0%	0.0	46.7%	-42.9%	-3.9%	116.8
Shoreham	0.0%	0.0%	0.0%	0.0	100.0%	-100.0%	0.0%	7.4
Sodus Twp	0.0%	0.0%	0.0%	0.0	27.7%	-21.4%	-6.3%	195.2
St Joseph	0.0%	0.0%	0.0%	0.0	22.8%	-18.4%	-4.4%	100.8

St Joseph Twp	0.0%	0.0%	0.0%	0.0	21.9%	-17.6%	-4.3%	80.6
Stevensville	0.0%	0.0%	0.0%	0.0	18.9%	-21.0%	2.0%	27.6
Three Oaks	76.2%	23.8%	0.0%	1.3	-11.6%	11.6%	0.0%	7.4
Three Oaks Twp	38.3%	51.5%	10.2%	19.6	11.9%	-1.9%	-10.0%	108.0
Watervliet	0.0%	0.0%	0.0%	0.0	26.0%	-20.2%	-5.8%	13.4
Watervliet Twp	0.0%	0.0%	0.0%	0.0	40.0%	-19.7%	-20.4%	114.7
Weesaw Twp	29.8%	61.2%	8.9%	24.5	8.5%	-5.6%	-2.9%	124.6

\* For the cities and townships that did not have any roads rated in 2009, the 2008 percentages are used instead. That is, the difference in the percentages for each category is taken from 2003 to 2008.

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