# ROAD CONDITION REPORT FOR ST. JOSEPH COUNTY

## MARCH 2014

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# ROAD CONDITION REPORT FOR ST. JOSEPH COUNTY

## Executive Summary

The Kalamazoo Area Transportation Study assisted in the data collection of road inventory for St. Joseph County in 2012 and 2013. The data collection efforts took place on Federal-Aid roads in the county. Since 2011 the Transportation Asset Management Council PASER data collection has changed what constitutes a "federal-aid eligible" road. This change excludes some Rural Minor Collectors that were rated during previous years.

According to 23 USC 101, "Federal-aid eligible" roads are "highways on the Federal-aid highway systems and all other public roads not classified as local roads or rural minor collectors."

Within St. Joseph County, there are:

- **415 miles of Federal-aid roads**. This includes roads that are maintained by the Michigan Department of Transportation, the St. Joseph County Road Commission, and the cities and villages within the county. Of the 415 Federal-Aid miles in St. Joseph County, there are:

  **-270 miles of Major Collectors**
  **-92 Miles of Minor Arterials**
  **-52 miles of Other Principal Arterials** (defined by National Functional Classification)

- **135 miles of Trunkline roadways**. These roadways are maintained by the Michigan Department of Transportation.

# What is Asset Management?

"An ongoing process of maintaining, upgrading, and operating physical assets
cost effectively, based on a continuous physical inventory
and condition assessment."
- Act 499 of the Public Acts of 2002.

The State of Michigan defines asset management as "an ongoing process of maintaining, upgrading, and operating physical assets cost effectively, based on a continuous physical inventory and condition assessment." Asset management consists of a set of business principles and practices used to meet the goals of good ownership and effective, responsible management. The process allows transportation agencies to monitor the current condition of all federal aid eligible pavements, while also taking an inventory of potential preventative measures, to ensure the quality of the roads in the future. Implementation of asset management principles requires a shift from "Worst First" system management to one that considers the long range view of how the system functions.

### Principles of Asset Management

Asset management follows five core principles. They are:

- **Performance-Based**-Allows policy objectives to be broken down into daily operations decisions and strategic maintenance decisions.
- **Decisions Based on Quality Information**-Accurate information regarding the inventory, condition, and available funding of any of the assets involved.
- **Policy-Driven**-Resource allocation decisions that are based on well-defined performance goals and objectives. Alternatives are examined, and often level of service, system conditions, and community goals are reflected.
- **Analysis of Mix of Fixes, Options and Tradeoffs**-A system-wide assessment is made to determine the most valuable alternatives to invest in current and future system performance.
- **Monitoring to Provide Clear Accountability and Feedback**-The system needs to be consistently monitored to ensure that the chosen investments are meeting the predetermined goals and policy objectives.

All agencies currently apply some form of these principles, and for that reason, existing principles can be easily built upon in order to implement a successful asset management plan.

### Benefits of Asset Management

Asset management provides public agencies with a better understanding of the relationship between cost and performance. This understanding allows for better management, which is often directly reflected in the improvement of performance. In addition to the overall improvement of an agency's performance, there are many benefits of implementing asset management principles and practices. These benefits include:

- Improved service to customers;
- Improved cost-effectiveness and use of available resources;
- Improved communication with elected officials and the public about level of service vs. cost of service; and
- Improved credibility and accountability for decision-making process and results.

In order to gain these benefits, an agency must evaluate its current business practices, establish where significant improvements can be made, and develop a plan to institute changes.

# PASER Rating Scale

PASER (Pavement Surface Evaluation and Rating) is a simple "windshield" survey of road surface quality, which was developed by the University of Wisconsin-Madison to be used as the state's standard road rating system. The system uses manuals that provide visual aids for identifying different types, and the extent of, various defects that may be visually present in any given section of road. These defects are compared to a ten point PASER scale to determine their quality. On the PASER rating scale, one represents a failed road, and ten, a new road. The time that it takes a road to cycle from excellent to poor on the PASER scale is largely dependent on traffic volume and construction quality.

Using the PASER rating scale on paved surfaces within a county aids in predicting deterioration rates of surfaces. This information is important in order to create a plan of maintenance and replacement that is both efficient and cost effective.

**PASER Categories**
When surveying a paved surface for defects, there are four main categories to keep in mind. These categories are:

- **Surface Defects-** These include raveling (minimal aggregate on pavement surface), flushing (excess aggregate on pavement surface), or polishing (worn down aggregate on pavement surface)
- **Surface Deformation-** Includes rutting of wheel paths and pavement distortion
- **Cracks-** Can be transverse, longitudinal, Reflection, slippage, alligator, and block cracks
- **Patches and Potholes-** Patches are when previous damage has been filled by new asphalt patch material, and potholes are surface damage caused by traffic, fatigue, and poor drainage.

**How Data is Collected**
Data is collected by three person teams that consist of one MDOT employee, one member of the local road commission, and one member from the regional planning agency. Together, this team is responsible for evaluating pavement and recording information about each road, using a laptop and a GPS receiver. This information includes the type of road (surface type), the number of lanes, and the road condition (PASER Rating).

**Treatments**
Applying a rating system like PASER to a paved network of roads allows for an efficient way to inventory and evaluate transportation assets. These evaluations can then be used to create a prioritized arrangement of projects, and select from any of the treatment alternatives. Effective management of pavement keeps the condition of the road ahead of rapid deterioration with treatments that are lower cost.

There are a number of treatment options that directly correlate to the PASER score of a paved surface. The better the road is rated, the less treatment it requires. For example, roads with a PASER rating 8-10 only require routine maintenance through scheduled activities like sweeping, drainage clearing, shoulder clearing/grading, and crack seal/slurry coat to prevent water infiltration. 5-7 rated roads require capital preventative maintenance. If a road is rated 1-4 on the PASER scale, then it requires some form of structural improvement. If the roadway deteriorates past a 4 on the PASER scale, capital preventative maintenance methods of treatment are not viable.

# ROAD CONDITION REPORT FOR ST. JOSEPH COUNTY

The following table illustrates PASER ratings for asphalt pavements, which constitute the majority of roads in St. Joseph County.

**Table 1**

| Rating | Visible Distress | General Treatment & Conditions |
|---|---|---|
| **10** **Good** | None | New Construction |
| **9** **Good** | None | Recent Overlay |
| **8** **Good** | No longitudinal cracks except reflection of paving joints. Occasional transverse cracks, widely spaced (40' or greater). All cracks sealed or tight (open less than 1/4"). | Recent sealcoat or new cold mix. Little or no maintenance required. |
| **7** **Fair** | Very slight or no raveling, surface shows some traffic wear. Longitudinal cracks (open 1/4") due to reflection or paving joints. Transverse cracks (open 1/4") spaced 10' or more apart, little or slight crack raveling. No patching or very few patches in excellent condition. | First signs of aging. Maintain with routine crack filling. |
| **6** **Fair** | Slight raveling (loss of fines) and traffic wear. Longitudinal cracks (open 1/4"– 1/2"), some spaced less than 10'. First sign of block cracking. Sight to moderate flushing or polishing. Occasional patching in good condition. | Shows signs of aging. Sound structural condition. Could extend life with sealcoat. |
| **5** **Fair** | Moderate to severe raveling (loss of fine and coarse aggregate). Longitudinal and transverse cracks (open 1/2") show first signs of slight raveling and secondary cracks. First signs of longitudinal cracks near pavement edge. Block cracking up to 50% of surface. Extensive to severe flushing or polishing. Some patching or edge wedging in good condition. | Surface aging. Sound structural condition. Needs sealcoat or thin non-structural overlay (less than 2") |
| **4** **Poor** | Severe surface raveling. Multiple longitudinal and transverse cracking with slight raveling. Longitudinal cracking in wheel path. Block cracking (over 50% of surface). Patching in fair condition. Slight rutting or distortions (1/2" deep or less) | Significant aging and first signs of need for strengthening. Would benefit from a structural overlay (2" or more). |
| **3** **Poor** | Closely spaced longitudinal and transverse cracks often showing raveling and crack erosion. Severe block cracking. Some alligator cracking (less than 25% of surface). Patches in fair to poor condition. Moderate rutting or distortion (1" or 2" deep). Occasional potholes. | Needs patching and repair prior to major overlay. Milling and removal of deterioration extends the life of overlay. |
| **2** **Poor** | Alligator cracking (over 25% of surface). Severe distortions (over 2" deep) Extensive patching in poor condition. Potholes. | Severe deterioration. Needs reconstruction with extensive base repair. Pulverization of old pavement is effective |
| **1** **Poor** | Severe distress with extensive loss of surface integrity | Failed. Needs total reconstruction. |

**Table 2**

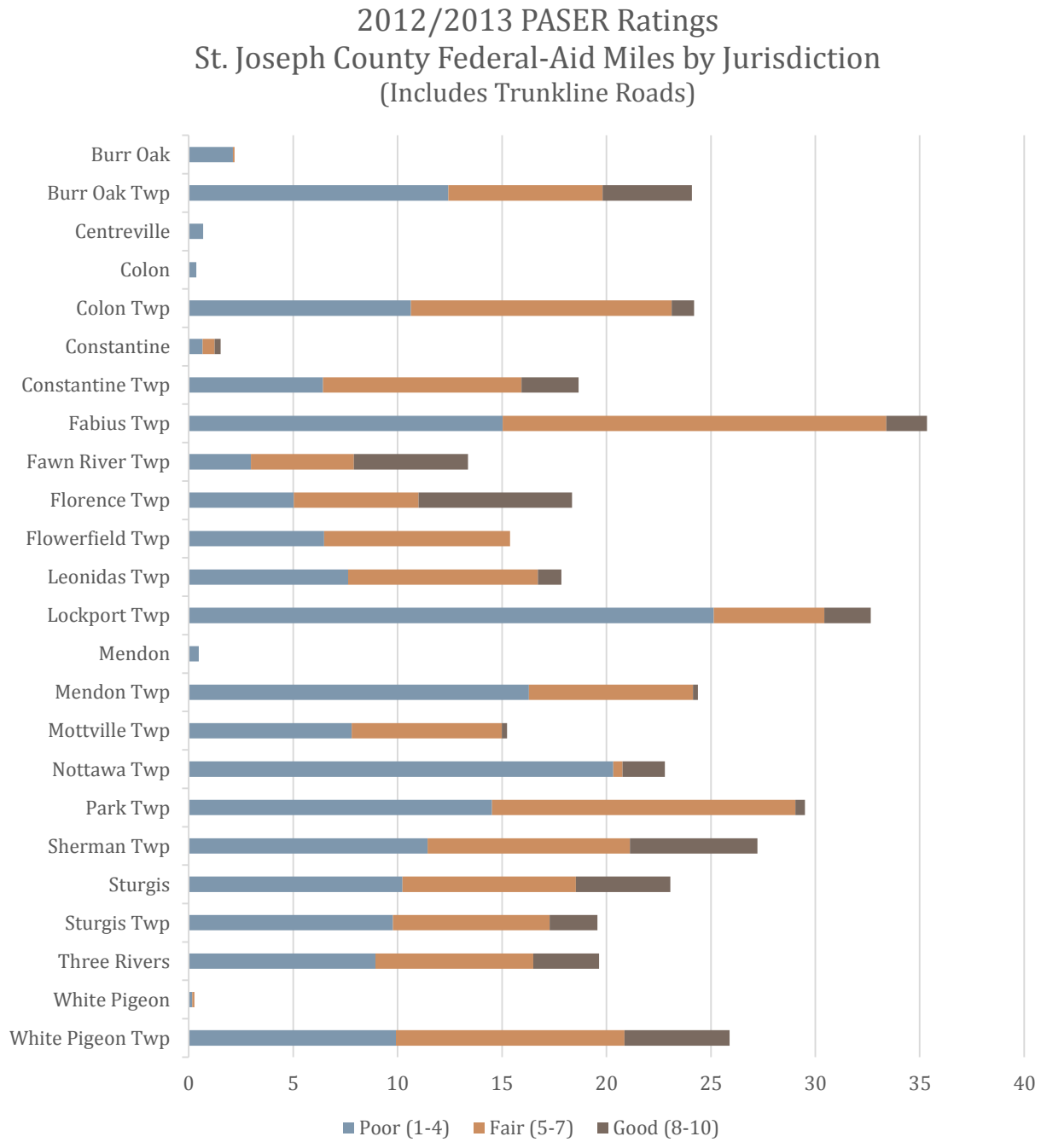
| Treatment | Life Extension (Average Years) | PASER Rating | Cost per Mile | Average Cost per Additional Year |
|---|---|---|---|---|
| **Overband Crack Filling** | 4 | 6 to 7 | $15,000 | $3,750 |
| **Fog Seal Coat** | 4 | 5 to 7 | $5,000 | $1,250 |
| **One Course Non-Structural Overlay** | 7 | 5 to 6 | $60,000 | $8,571 |
| **Single Course Chip Seal** | 6 | 5 to 7 | $15,000 | $2,500 |
| **Double Course Chip Seal** | 7.5 | 5 to 7 | $25,000 | $3,333 |
| **Cold In-Place Recycling** | 20 | 3 to 5 | $200,000 | $10,000 |

**Capital Preventative Maintenance and Reconstructive Treatments**

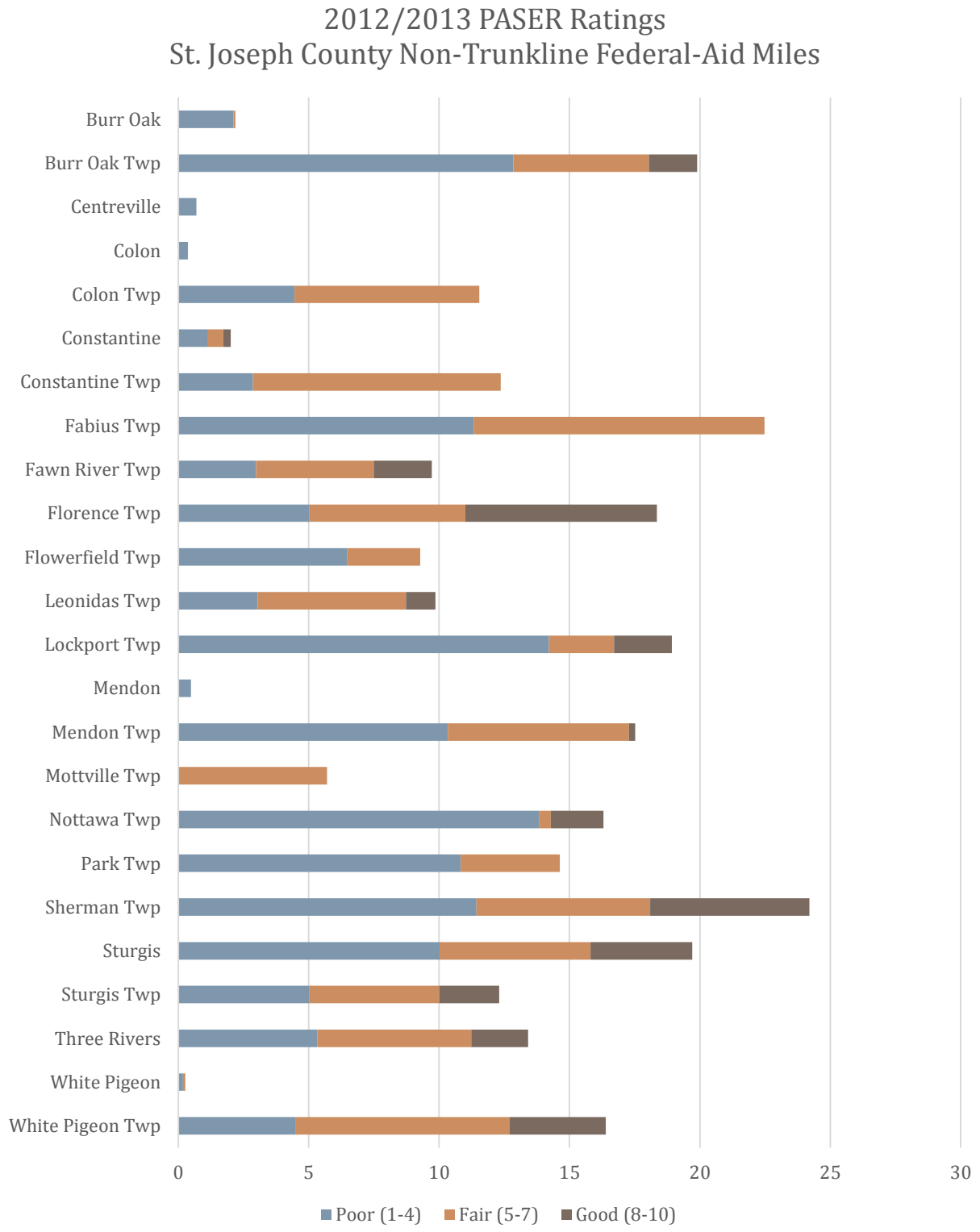
Table 2 details the expected cost, lifespan, and rating of each treatment type when applied to roads that need maintenance. These treatments range from the minimal (overband crack filling) to major construction. The following list provides a brief overview of when each treatment is used in St. Joseph County. These treatments are suggested by PASER, and may not be appropriate fixes to every situation.

- Overband Crack Filling is used on cracks that are up to 1" wide, and are moving or unmoving. The process is done using hot poured rubber material.
- Fog Seals provide a thin asphalt coating over existing pavement. This treatment seals aggregate in place while preventing rutting, and water permeation.
- Non-Structural Overlays do not contribute to a pavement's structural capacity. These treatments require thin layers of asphalt (1/2- 1 ½ inches) to be smoothed on top of existing pavement. Applying this treatment to roads improves surface quality and drainage.
- Chip Seals require a thin application of asphalt applied to the road surface, which is topped with a coarse aggregate.
- Cold In-Place Recycling does not involve the use of heat. Instead, the surface is pulverized and mixed with an asphalt emulsion and then used to repave the same road.

# Summary of 2012 and 2013 Ratings



# ROAD CONDITION REPORT FOR ST. JOSEPH COUNTY



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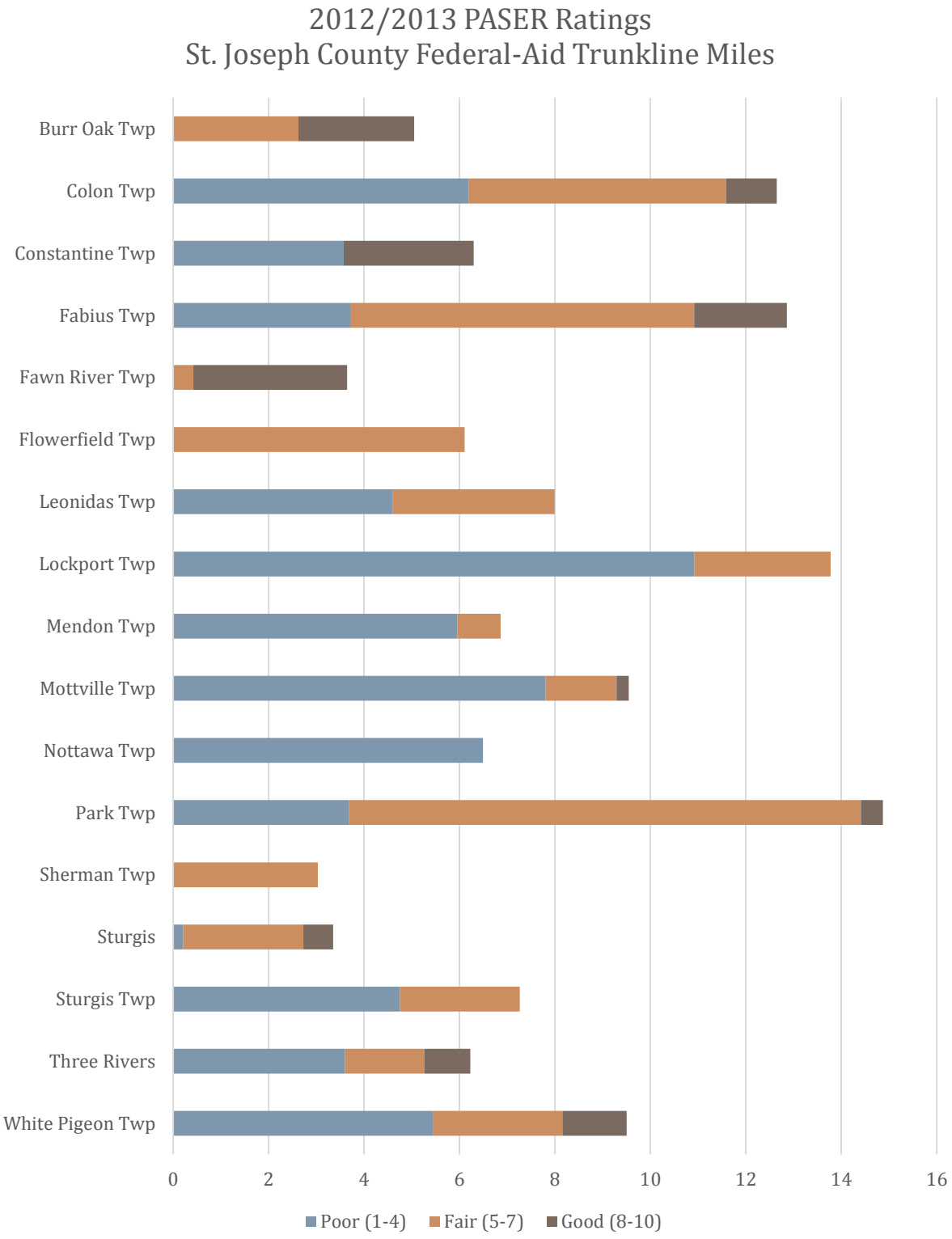

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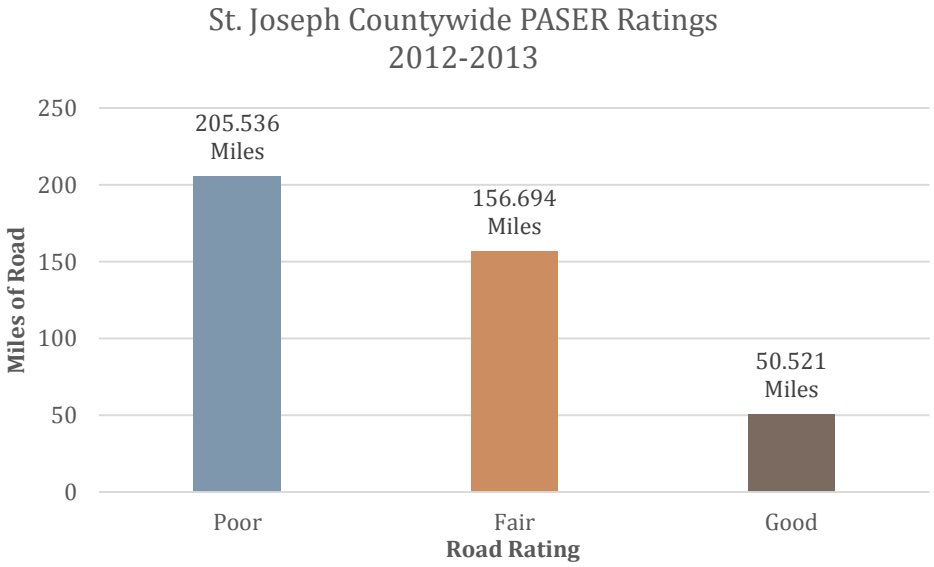
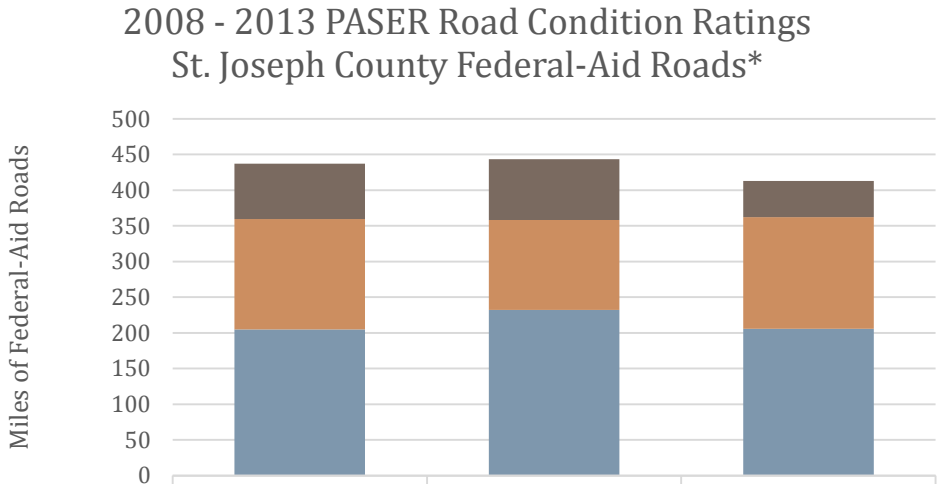


# Historical Data Collection




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Good (8-10) | 77.595 | 85.092 | 50.521 |
| Fair (5-7) | 154.94 | 125.954 | 156.694 |
| Poor (1-4) | 204.71 | 232.374 | 205.536 |

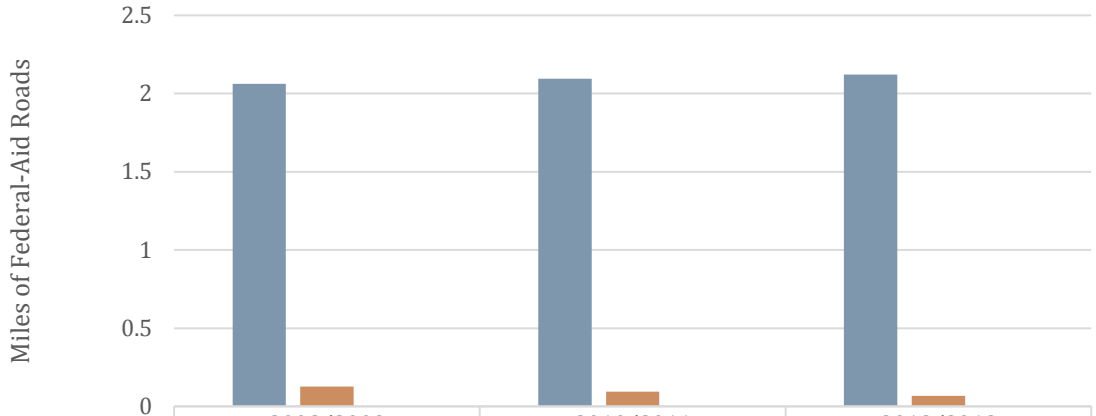
*The decrease in total miles is due to the exclusion of minor collector road ratings in 2012 and 2013.

The chart above reflects the progression of St. Joseph County's federal-aid roads over a five year period. From 2008 to 2013, there has been a slight increase in roads that are rated as being in "Fair" and "Poor" conditions, while the number of "Good" road miles has decreased substantially overall. Road miles rated with a PASER score of 8-10 (Good) showed a small increase of 7.497 miles between 2008/2009-2010/2011, with that number decreasing significantly by 34.571 miles from 2012/2013, resulting in a 27.074 mile depreciation over the course of five years.

When looking at township breakdowns from 2012/2013 on the previous three pages of this document, it is apparent that in each jurisdiction the majority of roads are Fair and Poor, with Good roads rated 8-10 constituting very little overall. This is the case for all roads, including federal-aid trunkline, and non-trunkline in St. Joseph County.

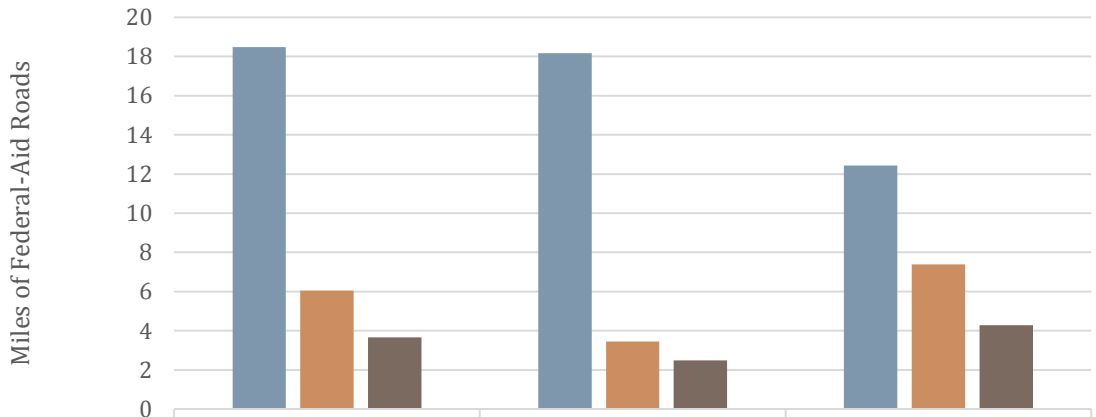
The decrease in total miles in each township or village over the course of five years is due to the inclusion of minor collector roads in the 2010/2011 PASER road survey.

## 2008-2013 PASER Road Condition Ratings
## Village of Burr Oak*
(2.189 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 2.061 | 2.095 | 2.121 |
| Fair (5-7) | 0.128 | 0.094 | 0.068 |
| Good (8-10) | 0 | 0 | 0 |

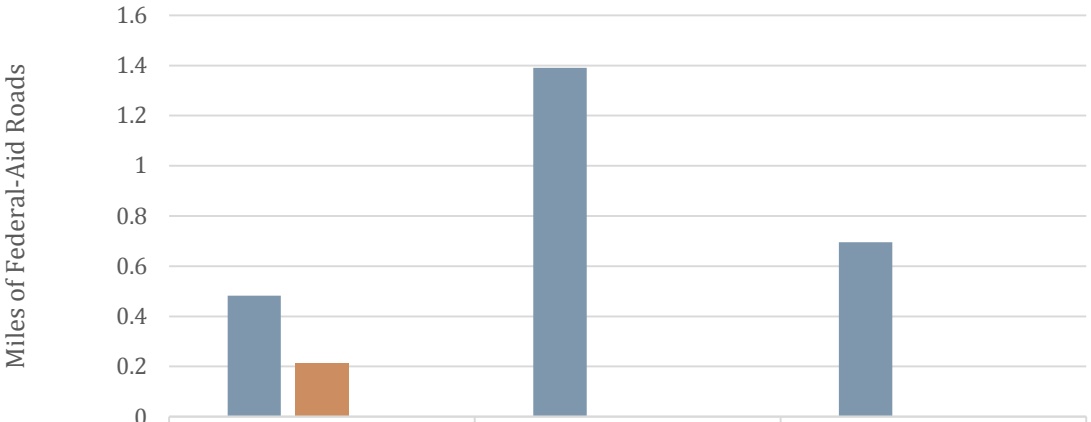
## 2008-2013 PASER Road Condition Ratings
## Burr Oak Township*
(24.094 mi)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 18.48 | 18.169 | 12.436 |
| Fair (5-7) | 6.04 | 3.443 | 7.381 |
| Good (8-10) | 3.665 | 2.482 | 4.277 |

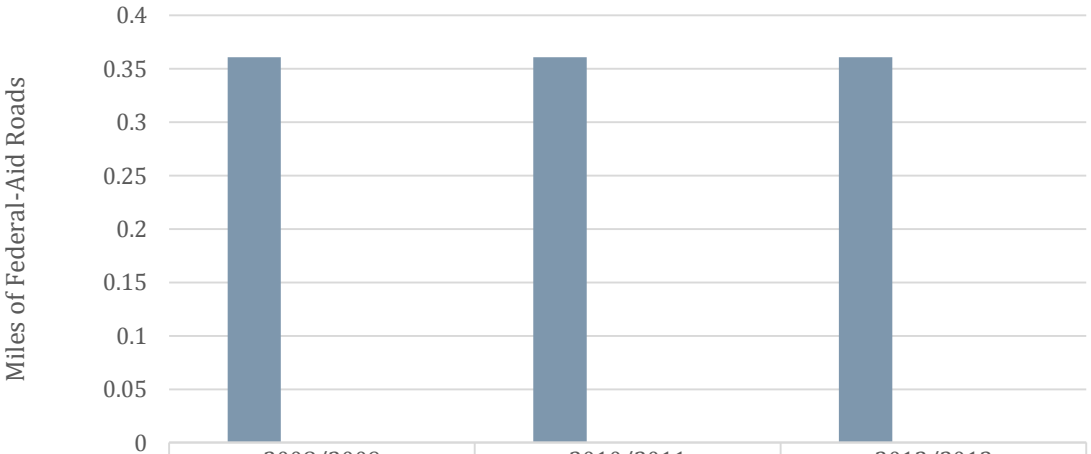
*The decrease in total miles is due to the exclusion of minor collector road ratings in 2012 and 2013.

## 2008-2013 PASER Road Condition Ratings
## Village of Centreville*
(0.695 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 0.482 | 1.39 | 0.695 |
| Fair (5-7) | 0.213 | 0 | 0 |
| Good (8-10) | 0 | 0 | 0 |

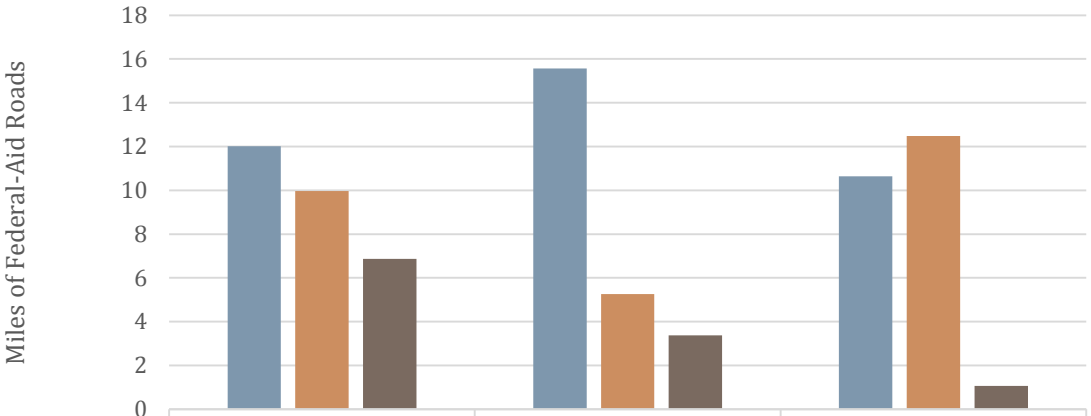
## 2008-2013 PASER Road Condition Ratings
## Village of Colon*
(0.361 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 0.361 | 0.361 | 0.361 |
| Fair (5-7) | 0 | 0 | 0 |
| Good (8-10) | 0 | 0 | 0 |

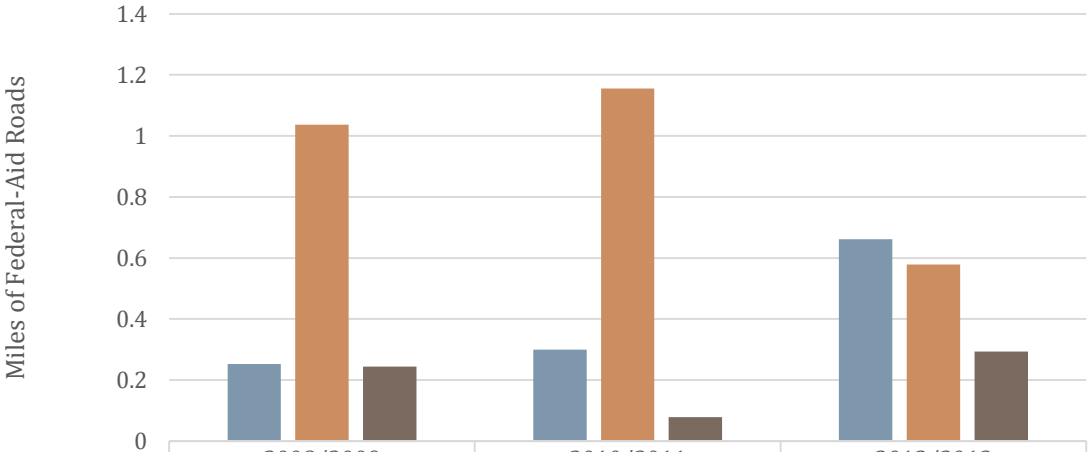
*The decrease in total miles is due to the exclusion of minor collector road ratings in 2012 and 2013.

## 2008-2013 PASER Road Condition Ratings
## Colon Township*
(24.195 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 12.017 | 15.571 | 10.642 |
| Fair (5-7) | 9.97 | 5.259 | 12.488 |
| Good (8-10) | 6.868 | 3.365 | 1.065 |

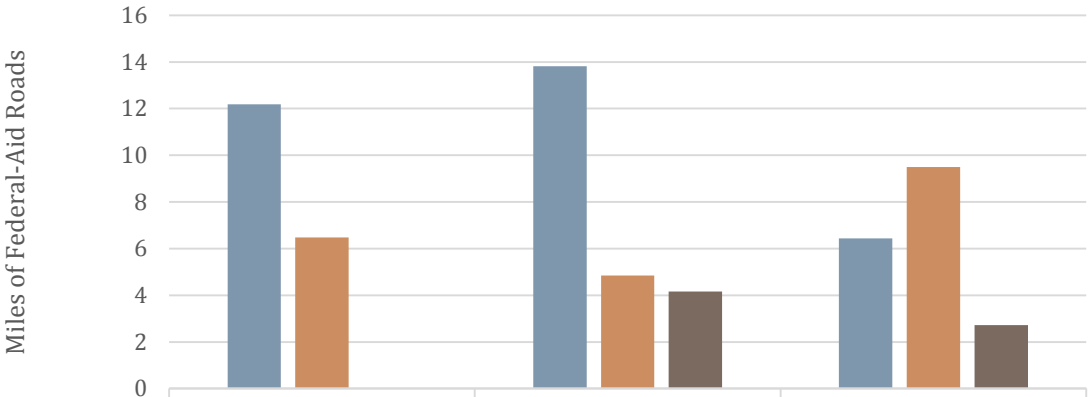
## 2008-2013 PASER Road Condition Ratings
## Village of Constantine*
(1.533 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 0.252 | 0.3 | 0.661 |
| Fair (5-7) | 1.037 | 1.155 | 0.579 |
| Good (8-10) | 0.244 | 0.078 | 0.293 |

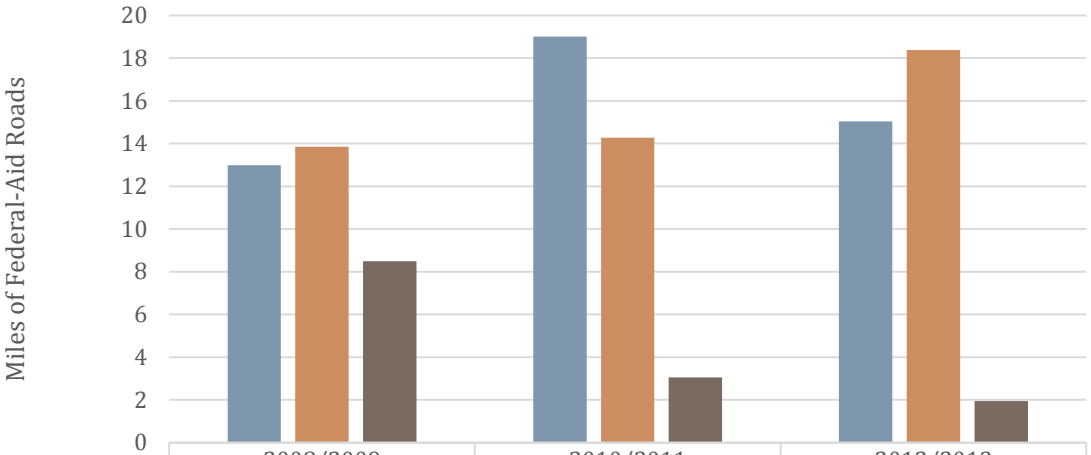
*The decrease in total miles is due to the exclusion of minor collector road ratings in 2012 and 2013.

## 2008-2013 PASER Road Condition Ratings
## Constantine Township*
(18.664 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 12.18 | 13.817 | 6.437 |
| Fair (5-7) | 6.484 | 4.847 | 9.501 |
| Good (8-10) | 0 | 4.161 | 2.726 |

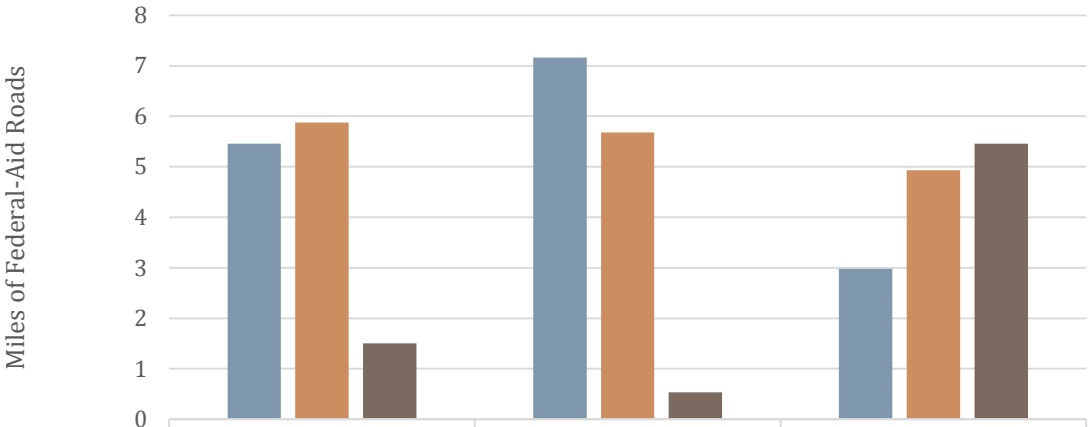
## 2008-2013 PASER Road Condition Ratings
## Fabius Township*
(35.344 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 12.988 | 19.007 | 15.032 |
| Fair (5-7) | 13.856 | 14.277 | 18.368 |
| Good (8-10) | 8.491 | 3.05 | 1.944 |

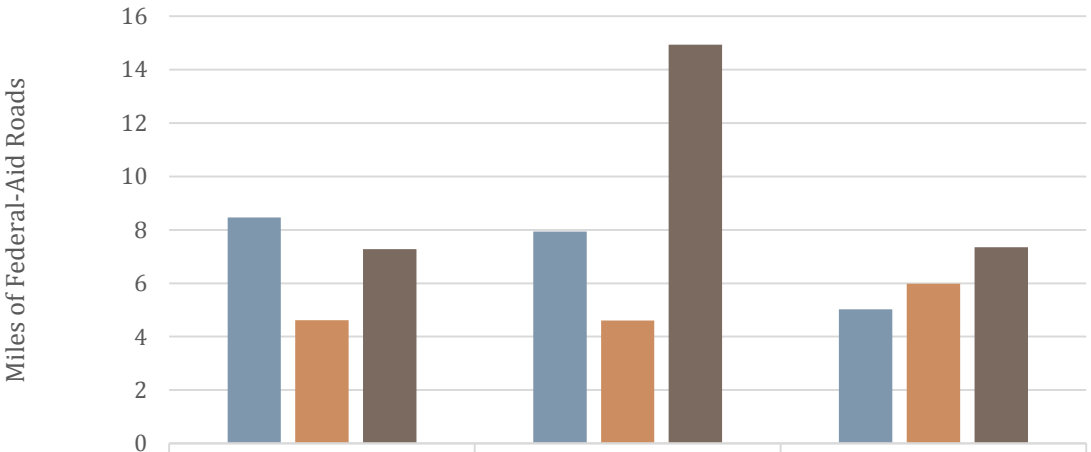
*The decrease in total miles is due to the exclusion of minor collector road ratings in 2012 and 2013.

## 2008-2013 PASER Road Condition Ratings
## Fawn River Township*
(13.369 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 5.457 | 7.159 | 2.982 |
| Fair (5-7) | 5.877 | 5.678 | 4.931 |
| Good (8-10) | 1.503 | 0.532 | 5.456 |

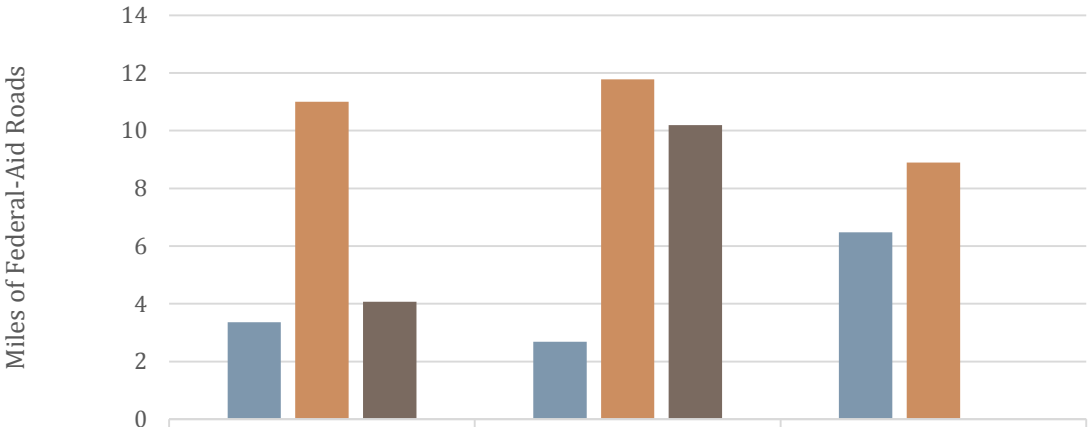
## 2008-2013 PASER Road Condition Ratings
## Florence Township*
(18.349 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 8.458 | 7.934 | 5.026 |
| Fair (5-7) | 4.619 | 4.608 | 5.979 |
| Good (8-10) | 7.275 | 14.936 | 7.344 |

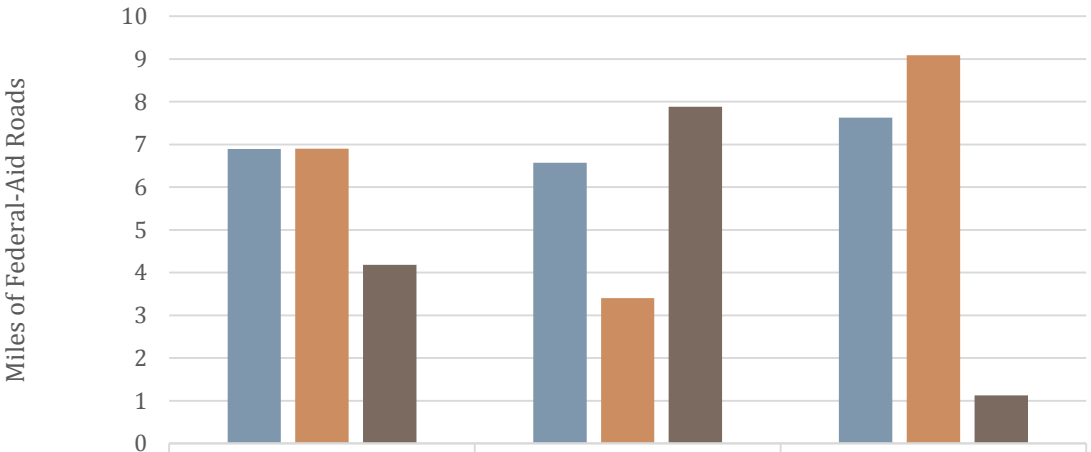
*The decrease in total miles is due to the exclusion of minor collector road ratings in 2012 and 2013.

## 2008-2013 PASER Road Condition Ratings
## Flowerfield Township*
(15.381 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 3.359 | 2.683 | 6.48 |
| Fair (5-7) | 10.998 | 11.78 | 8.901 |
| Good (8-10) | 4.072 | 10.19 | 0 |

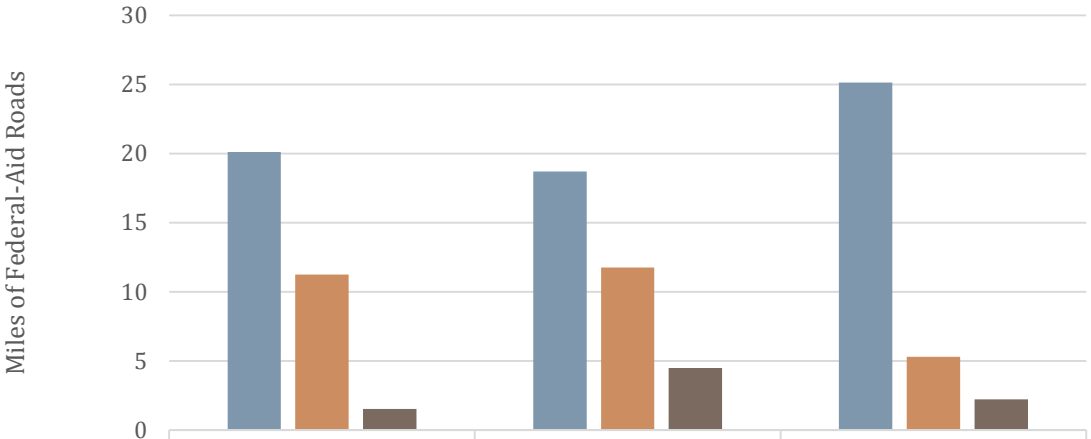
## 2008-2013 PASER Road Condition Ratings
## Leonidas Township*
(17.848 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 6.892 | 6.57 | 7.63 |
| Fair (5-7) | 6.9 | 3.4 | 9.091 |
| Good (8-10) | 4.183 | 7.878 | 1.127 |

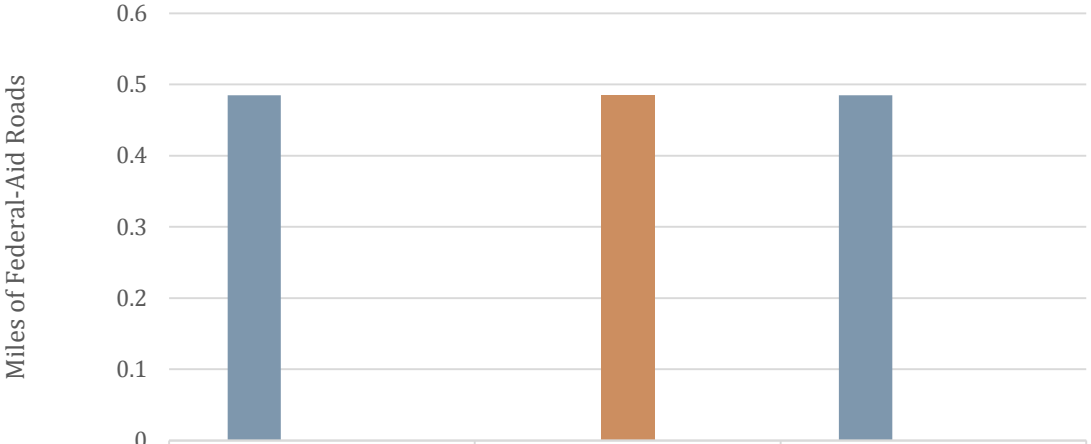
*The decrease in total miles is due to the exclusion of minor collector road ratings in 2012 and 2013.

## 2008-2013 PASER Road Condition Ratings
## Lockport Township*
(32.656 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 20.107 | 18.696 | 25.133 |
| Fair (5-7) | 11.259 | 11.76 | 5.302 |
| Good (8-10) | 1.536 | 4.504 | 2.221 |

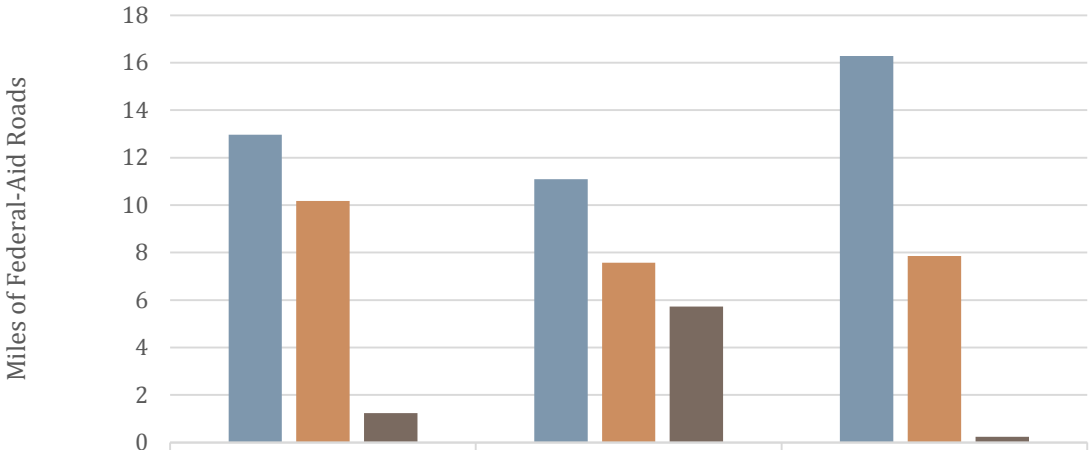
## 2008-2013 PASER Road Condition Ratings
## Village of Mendon*
(0.485 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 0.485 | 0 | 0.485 |
| Fair (5-7) | 0 | 0.485 | 0 |
| Good (8-10) | 0 | 0 | 0 |

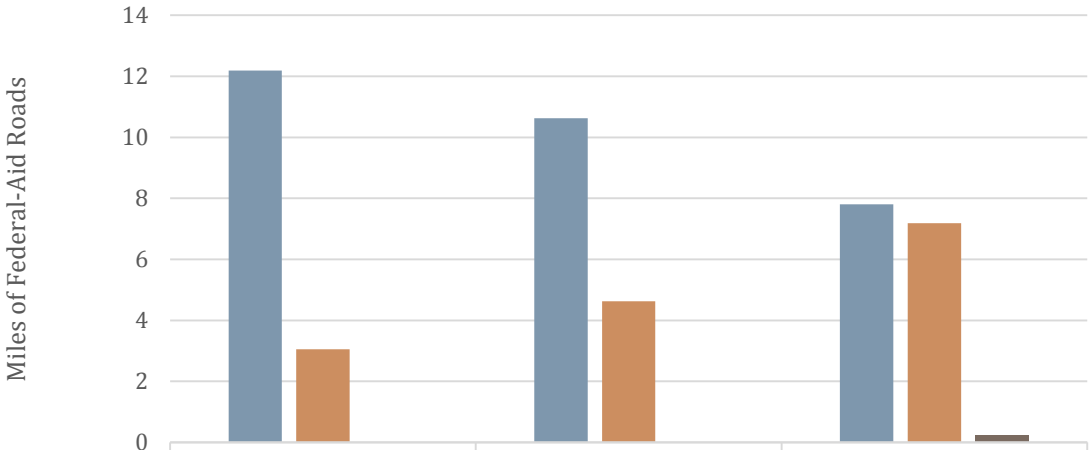
*The decrease in total miles is due to the exclusion of minor collector road ratings in 2012 and 2013.

## 2008-2013 PASER Road Condition Ratings
## Mendon Township*
(24.384 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 12.969 | 11.087 | 16.29 |
| Fair (5-7) | 10.177 | 7.567 | 7.858 |
| Good (8-10) | 1.238 | 5.73 | 0.236 |

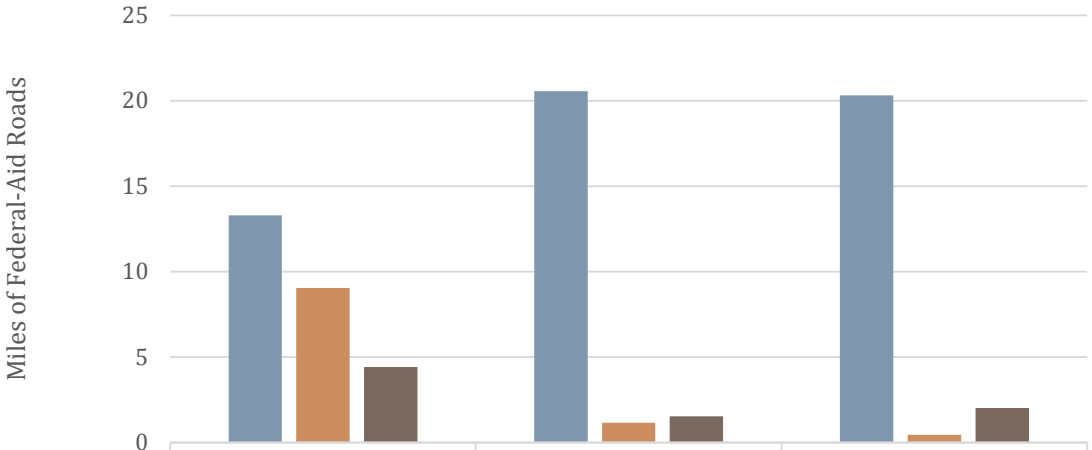
## 2008-2013 PASER Road Condition Ratings
## Mottville Township*
(15.244 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 12.192 | 10.621 | 7.805 |
| Fair (5-7) | 3.052 | 4.623 | 7.183 |
| Good (8-10) | 0 | 0 | 0.256 |

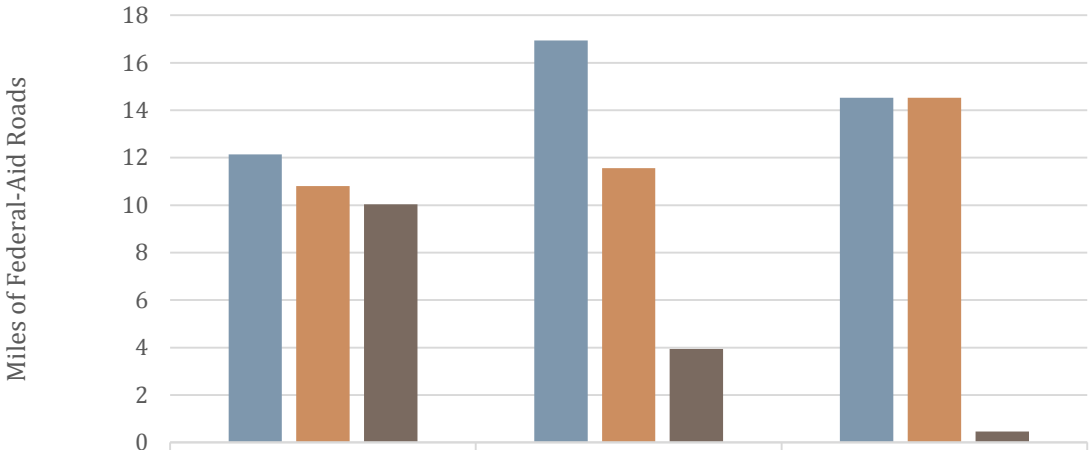
*The decrease in total miles is due to the exclusion of minor collector road ratings in 2012 and 2013.

## 2008-2013 PASER Road Condition Ratings
## Nottawa Township*
(22.798 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 13.286 | 20.55 | 20.322 |
| Fair (5-7) | 9.038 | 1.156 | 0.452 |
| Good (8-10) | 4.407 | 1.53 | 2.024 |

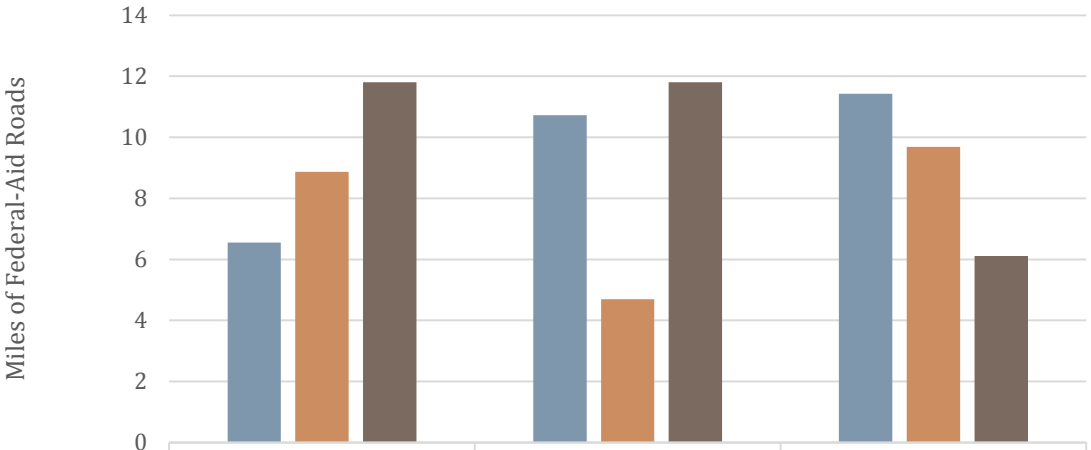
## 2008-2013 PASER Road Condition Ratings
## Park Township*
(29.501 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 12.135 | 16.935 | 14.519 |
| Fair (5-7) | 10.807 | 11.553 | 14.521 |
| Good (8-10) | 10.029 | 3.944 | 0.461 |

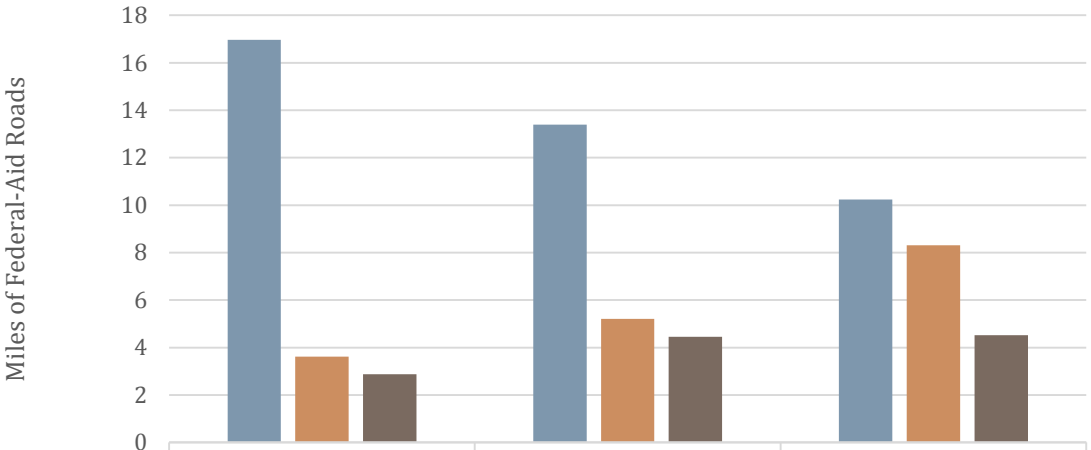
*The decrease in total miles is due to the exclusion of minor collector road ratings in 2012 and 2013.

## 2008-2013 PASER Road Condition Ratings
## Sherman Township*
(27.23 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 6.556 | 10.727 | 11.431 |
| Fair (5-7) | 8.864 | 4.693 | 9.692 |
| Good (8-10) | 11.81 | 11.81 | 6.107 |

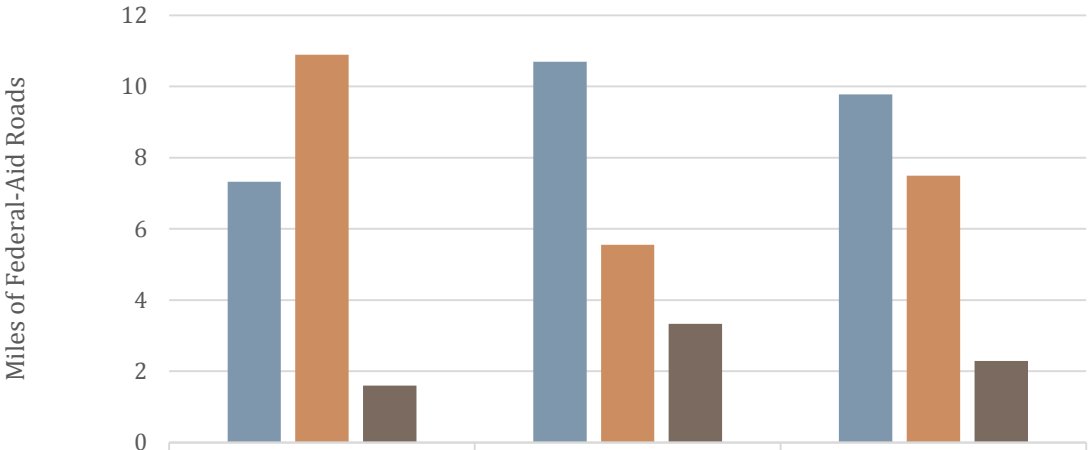
## 2008-2013 PASER Road Condition Ratings
## City of Sturgis*
(23.061 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 16.958 | 13.396 | 10.231 |
| Fair (5-7) | 3.621 | 5.211 | 8.306 |
| Good (8-10) | 2.869 | 4.454 | 4.524 |

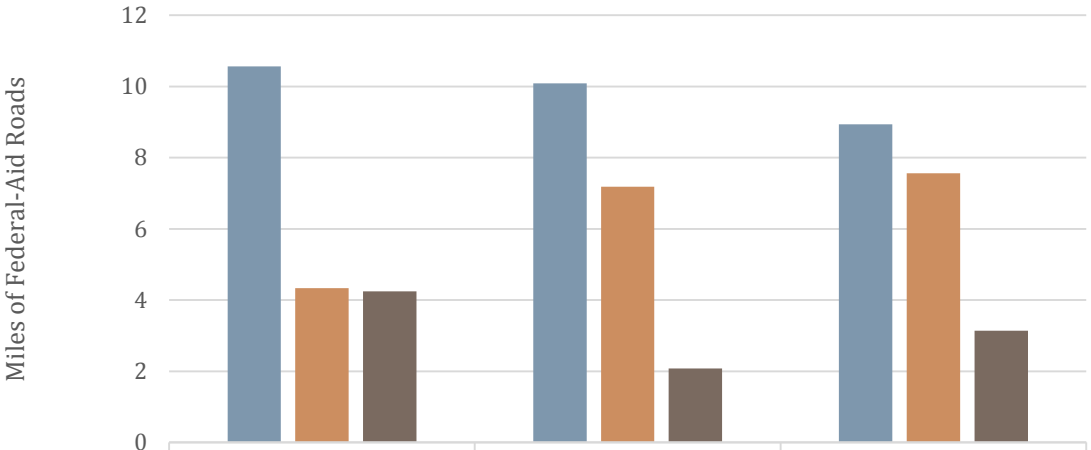
*The decrease in total miles is due to the exclusion of minor collector road ratings in 2012 and 2013.

## 2008-2013 PASER Road Condition Ratings
## Sturgis Township*
(19.57 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 7.319 | 10.691 | 9.78 |
| Fair (5-7) | 10.892 | 5.548 | 7.496 |
| Good (8-10) | 1.601 | 3.331 | 2.294 |

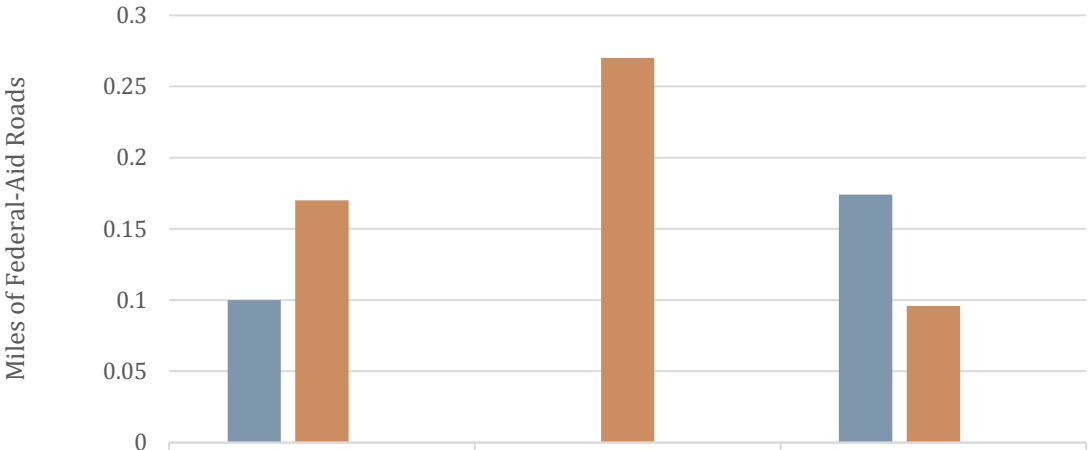
## 2008-2013 PASER Road Condition Ratings
## City of Three Rivers*
(19.641 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 10.565 | 10.088 | 8.936 |
| Fair (5-7) | 4.33 | 7.185 | 7.564 |
| Good (8-10) | 4.241 | 2.077 | 3.141 |

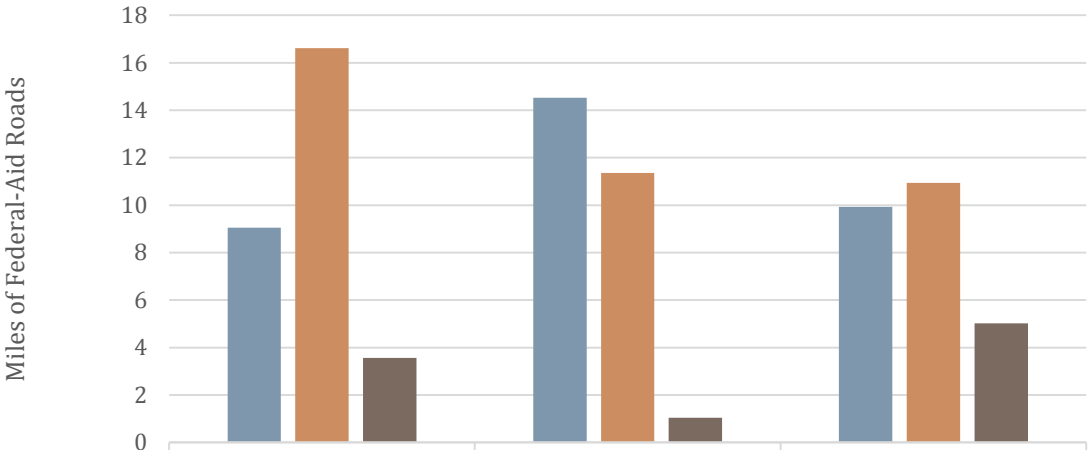
*The decrease in total miles is due to the exclusion of minor collector road ratings in 2012 and 2013.

## 2008-2013 PASER Road Condition Ratings
## Village of White Pigeon*
(0.27 Miles)




| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 0.1 | 0 | 0.174 |
| Fair (5-7) | 0.17 | 0.27 | 0.096 |
| Good (8-10) | 0 | 0 | 0 |

## 2008-2013 PASER Road Condition Ratings
## White Pigeon Township*
(25.889 Miles)



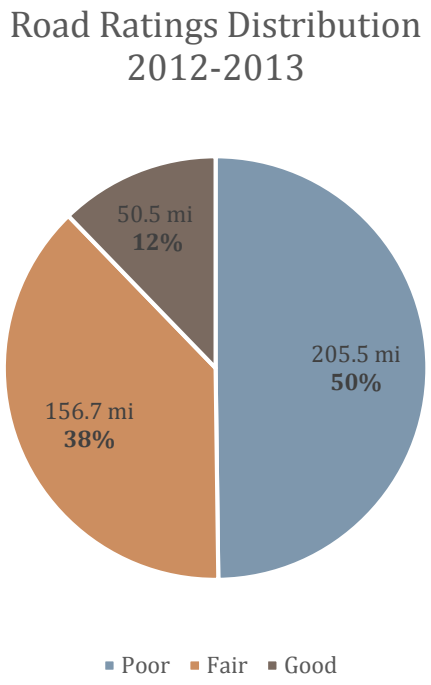

| | 2008/2009 | 2010/2011 | 2012/2013 |
|---|---|---|---|
| Poor (1-4) | 9.051 | 14.527 | 9.927 |
| Fair (5-7) | 16.608 | 11.362 | 10.937 |
| Good (8-10) | 3.563 | 1.04 | 5.025 |

*The decrease in total miles is due to the exclusion of minor collector road ratings in 2012 and 2013.

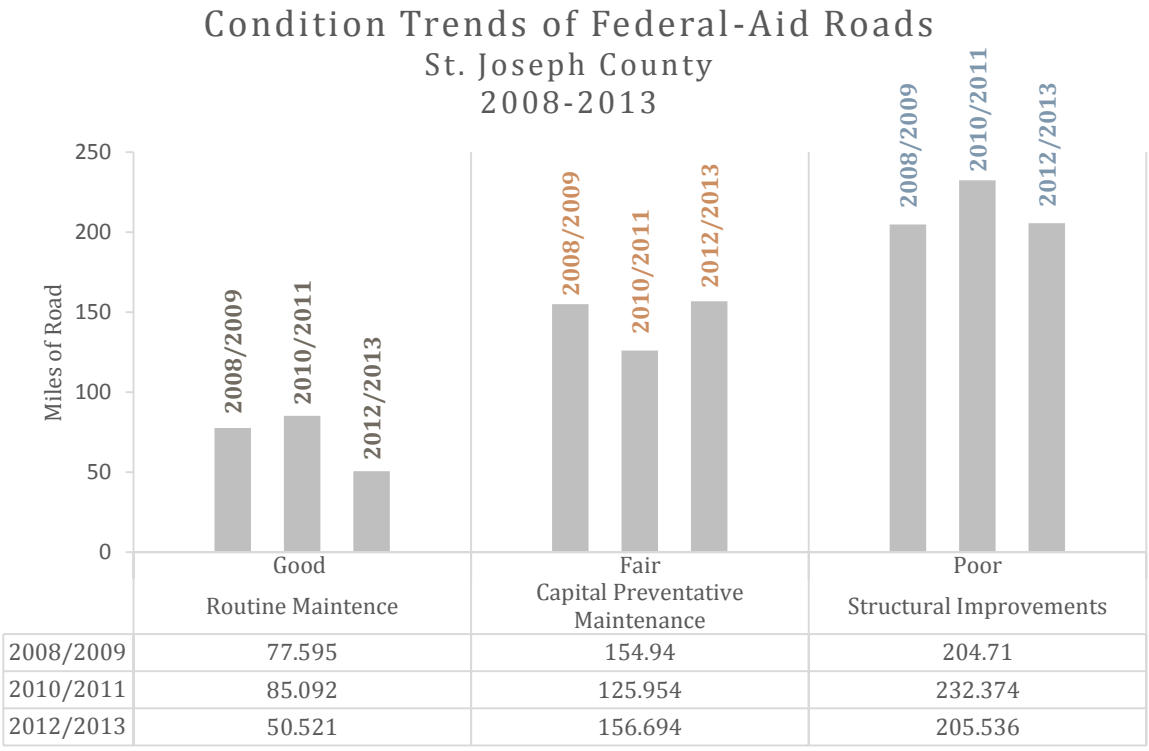
# Pavement Conditions

Of the 412 miles of federal-aid roads that were most recently rated (2012-2013), 205 miles are rated as being in "Poor" condition, 157 miles rated "Fair", and 51 miles "Good". This distribution means that currently, half of all federal-aid roads in St, Joseph County are in poor condition (have a PASER score of 1-4). The chart below illustrates the percentage distribution of road ratings. When looking at this chart, it is evident that the reduction of poor road miles in St. Joseph County should be a priority in the future.

Through asset management strategies, the amount of poor road miles and the maintenance costs associated with structural improvements can be diminished.



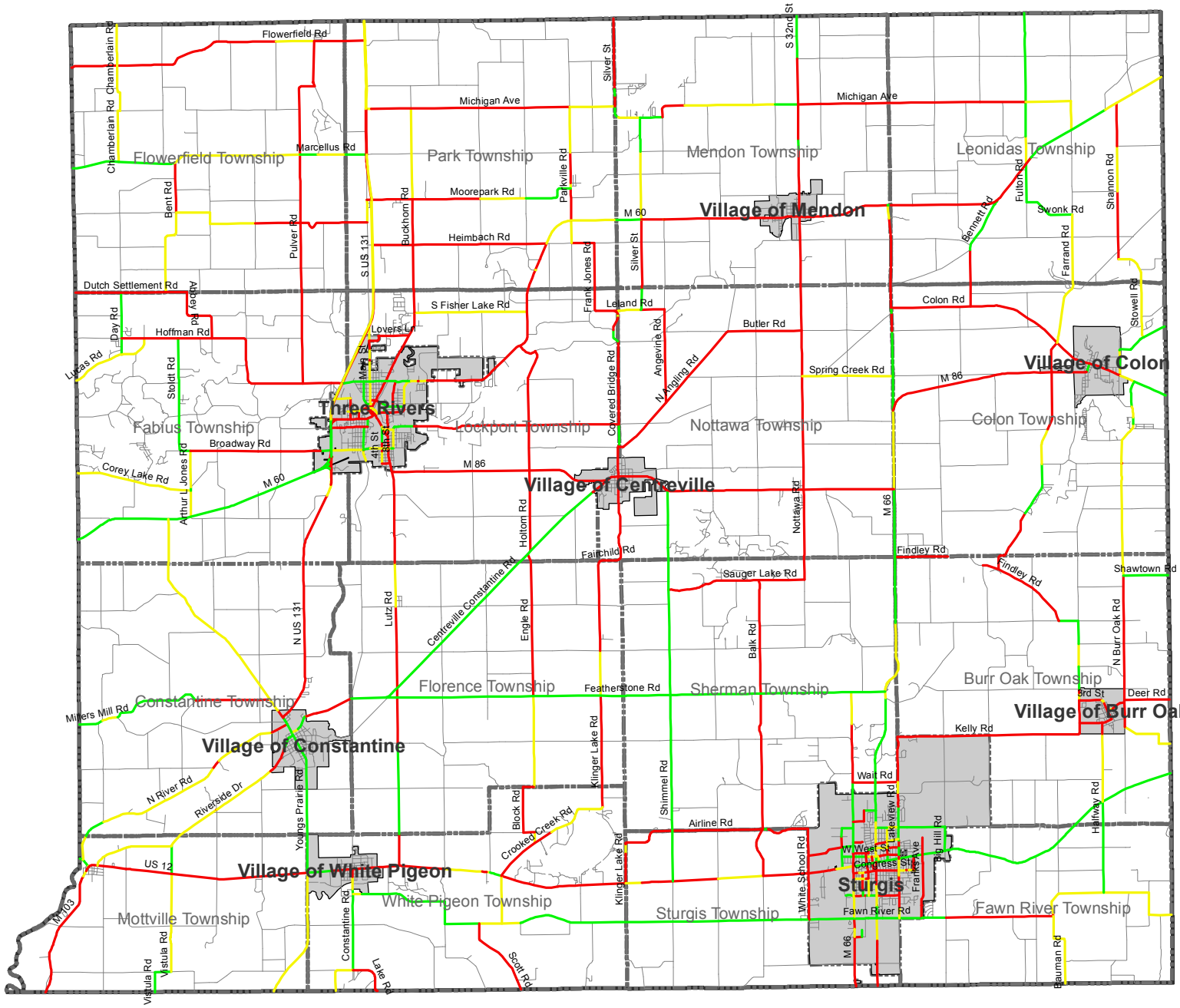
# ROAD CONDITION REPORT FOR ST. JOSEPH COUNTY




| | Good<br>Routine Maintence | Fair<br>Capital Preventative Maintenance | Poor<br>Structural Improvements |
|---|---|---|---|
| 2008/2009 | 77.595 | 154.94 | 204.71 |
| 2010/2011 | 85.092 | 125.954 | 232.374 |
| 2012/2013 | 50.521 | 156.694 | 205.536 |

The bar graph shown above illustrates quality of roads in St. Joseph County over the course of five years. Good and fair roads require minimal maintenance that is less costly, and therefore should be maintained whenever possible. The graph also shows that St. Joseph County has made an effort in the last few years to reverse trends that occurred between 2008 and 2011. This is evident in both the fair and poor ratings categories. Between 2008 and 2011, the number of fair road miles decreased, while the amount of poor roads increased. Within the last two years, these trends have reversed with fair roads increasing by approximately 30 miles, and roads in poor condition decreasing by approximately 30 miles. Focus should continue to be placed on maintaining roads in fair condition in order to continue decreasing the amount of poor roads countywide. It is important to administer capital preventative maintenance treatments that are less expensive before higher cost structural improvements become necessary.

Asset management is useful in helping to focus attention on good and fair pavements before they transition to poor roads that require structural improvements. Putting focus on fixing roads using asset management techniques will improve road networks overall, rather than using worst first strategies to maintain only a small percentage, while others get worse.




# St. Joseph County
# Federal-Aid Road Ratings 2012-2013

## Federal Aid Roads

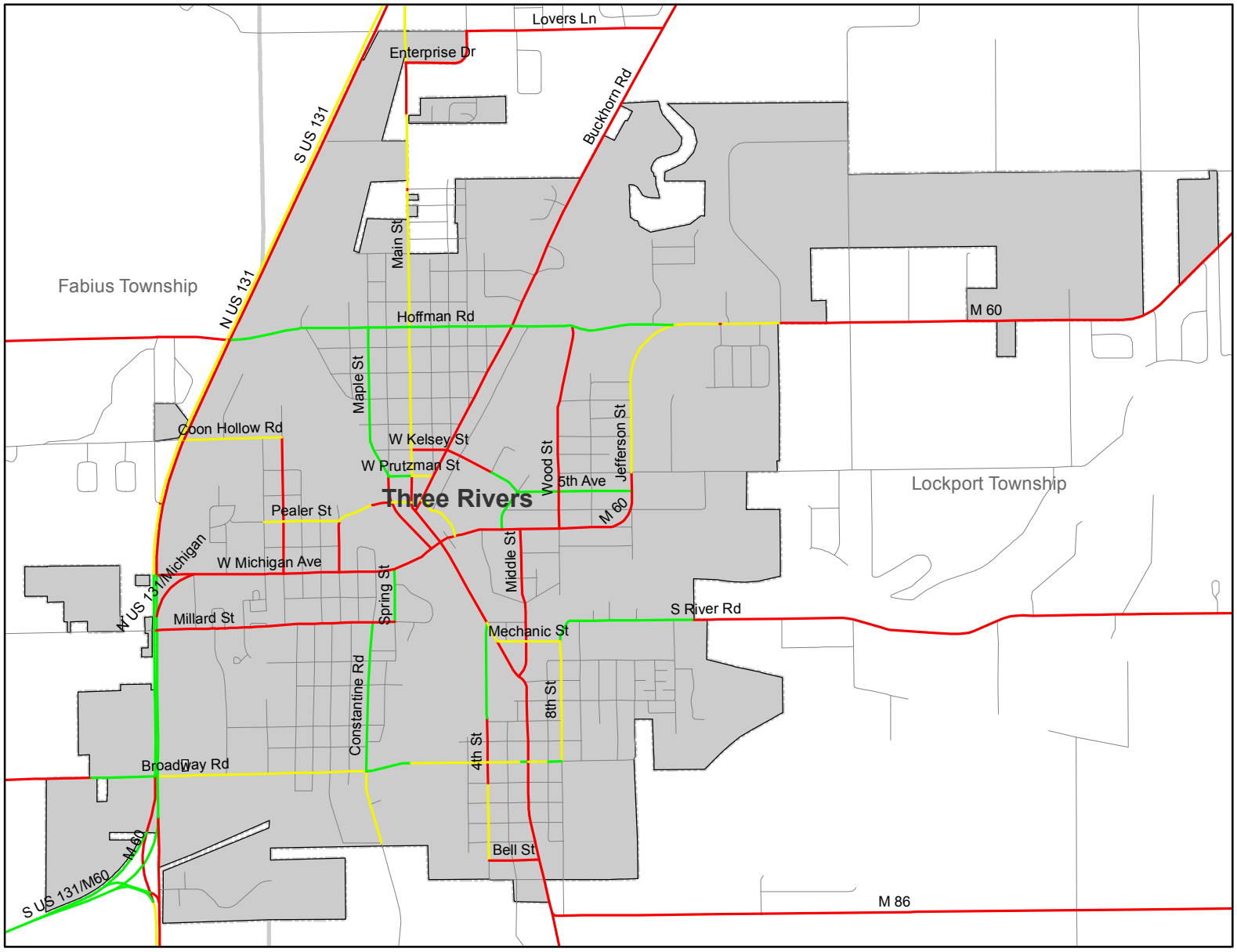
### PASER Rating

- 1 - 4 *Poor*
- 5 - 7 *Fair*
- 8 - 10 *Good*

0 1 2 4 6 8 Miles

Source: MGFv.11, KATS

Kalamazoo Area Transportation Study
5220 Lovers Lane, Suite 110 Portage, MI 49002 (269) 343-0766 info@katsmpo.org www.KATSmpo.org




# City of Three Rivers
# Federal Aid Road Ratings 2012-2013

**Federal-Aid Road**

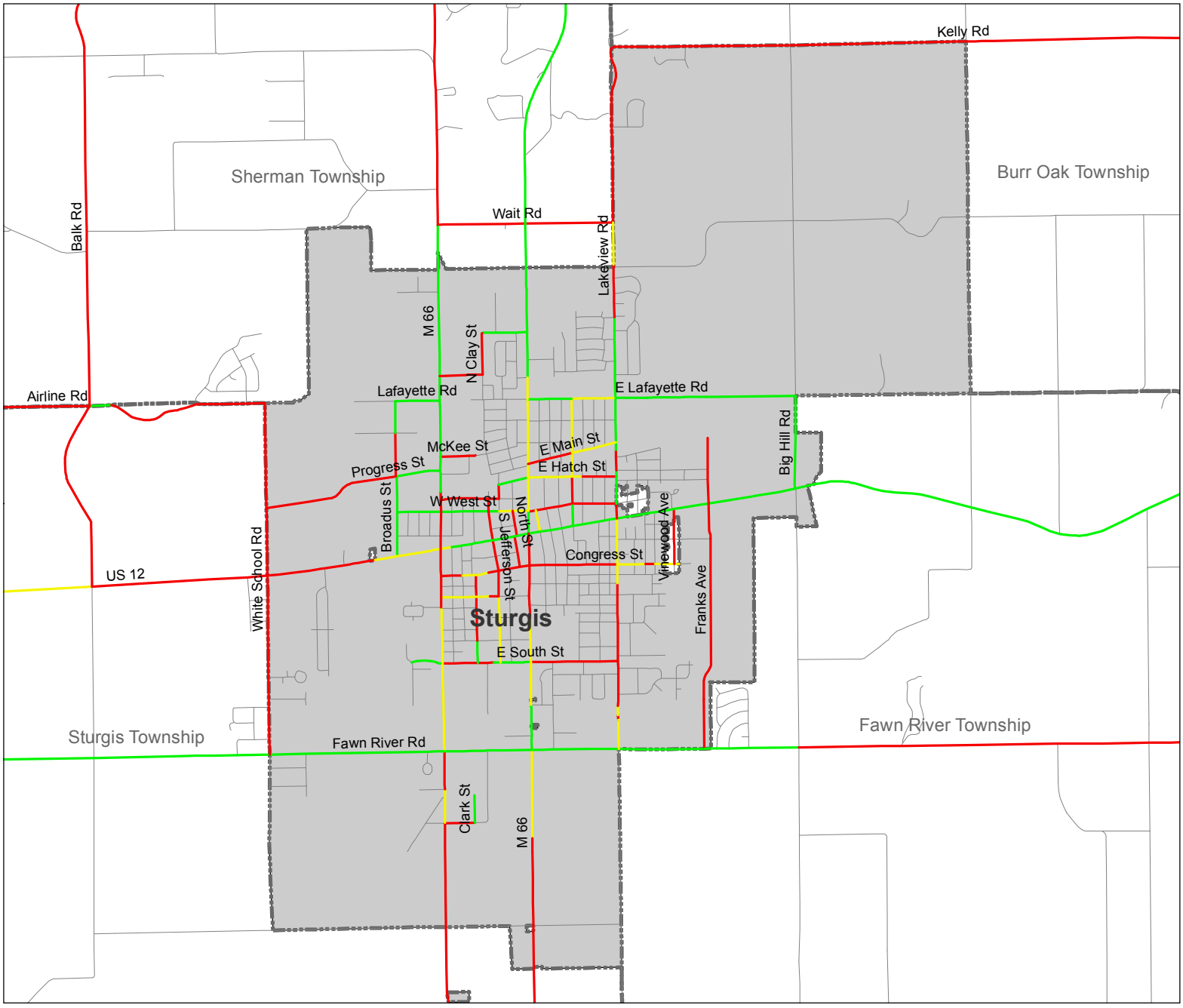
**PASER Ratings**

- 1 - 4 *Poor*
- 5 - 7 *Fair*
- 8 - 10 *Good*

0 0.125 0.25 0.5 0.75 1 Miles

Source:MGFv.11,KATS

KATS Kalamazoo Area Transportation Study
5220 Lovers Lane, Suite 110 Portage, MI 49002 (269) 343-0766 info@katsmpo.org www.KATSmpo.org




## City of Sturgis
## Federal Aid Road Ratings 2012-2013

### Federal Aid Roads

**PASER Ratings**

- 1 - 4 *Poor*
- 5 - 7 *Fair*
- 8 - 10 *Good*

0 0.25 0.5 1 1.5 2 Miles

Source: MGFv.11, KATS

KATS Kalamazoo Area Transportation Study

5220 Lovers Lane, Suite 110 Portage, MI 49002 (269) 343-0766 info@katsmpo.org www.KATSmpo.org

# Contact Information

For more information regarding the St. Joseph County Road Condition report, or for township and village specific maps, contact:

- **Kalamazoo Area Transportation Study**
  5220 Lovers Lane • Suite 110 • Portage, Michigan • 49002
  (269)343-0766 • info@katsmpo.org

- **St. Joseph County Road Commission**
  20914 Michigan 86 • Centreville, Michigan • 49032
  (269) 467-6393