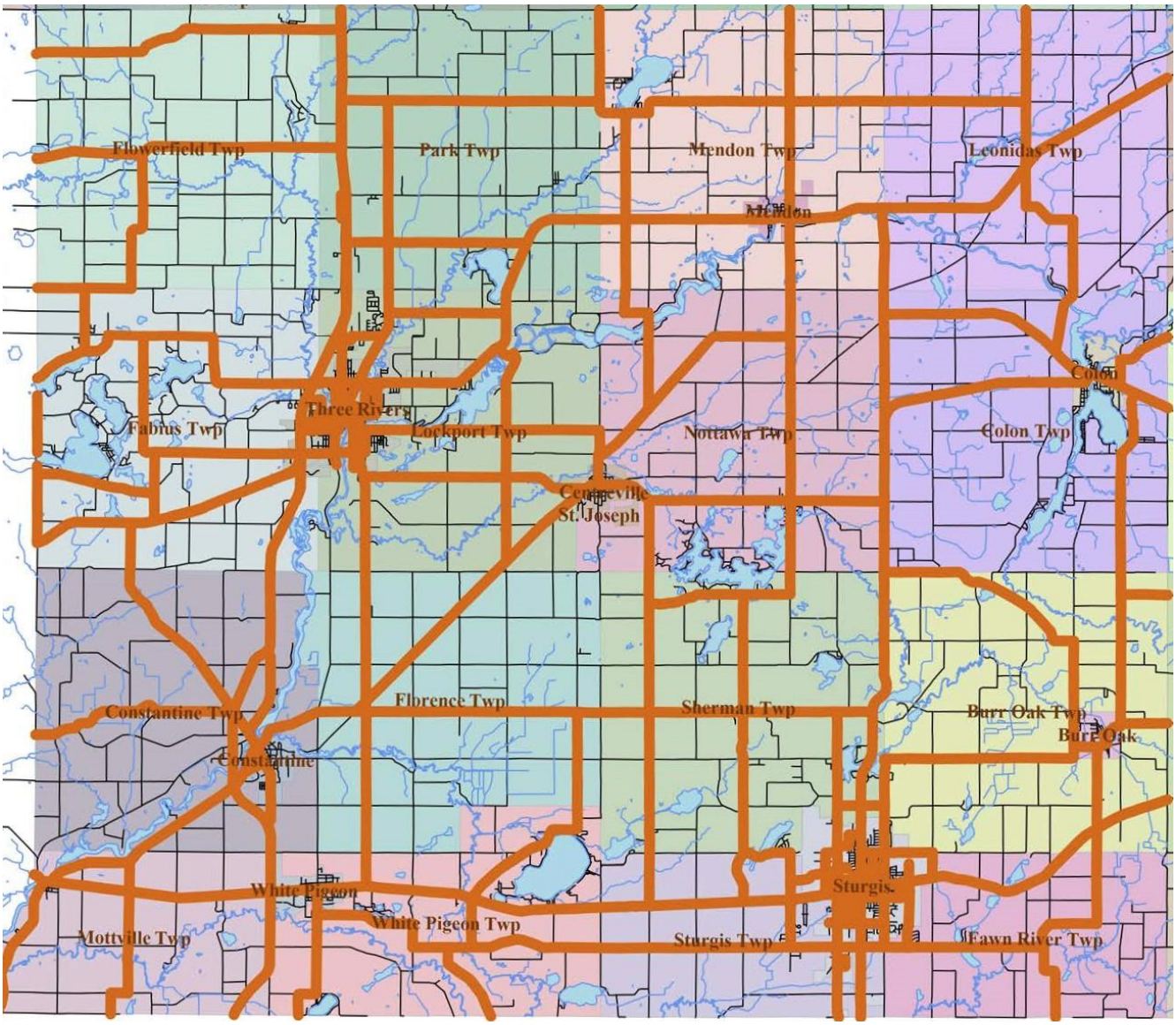

FEDERAL AID ROAD CONDITION REPORT FOR ST. JOSEPH COUNTY

2022

Prepared by the Kalamazoo Area Transportation Study | (269) 343-0766 | info@KATSmpo.org | www.KATSmpo.org

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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 2021. The data collection efforts took place on Federal-Aid roads in the county. 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:

- **419 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 414 Federal-Aid miles in St. Joseph County, there are:

- **140 miles of Trunkline roadways** maintained by the Michigan Department of Transportation
- **241 miles of County roads** maintained by the St. Joseph County Road Commission
- **38 miles of City streets** maintained by the incorporated cities and villages in the county

This report compiles ratings records for the last two years and compares the results with those from 2010 through 2018 to analyze the condition of the federal aid road system in St. Joseph County.

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 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 System

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 types and extents of various defects that may be visually present in any given section of road. This information is used to assign values from the ten-point PASER scale to rate their condition. 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 good to poor on the PASER scale is largely dependent on traffic volume and construction quality.

Regularly recording and charting the PASER rating over time on paved surfaces aids in predicting deterioration rates of surfaces. This information is important to the creation of 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 (loss of aggregate from the pavement surface), flushing (excess asphalt binder on pavement surface), or polishing (worn down and smoothed aggregate on pavement surface)
- **Surface Deformation-** Includes rutting of wheel paths and pavement distortion
- **Cracks-** Can be transverse, longitudinal, reflective, slippage, alligator, and block cracks
- **Patches and Potholes-** Patches are when previous damage has been filled by new material, and potholes are isolated 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 agency, and one member from the regional planning agency. Together, this team is responsible for evaluating pavement and recording information about each road segment using a laptop and a GPS receiver. This information includes the road surface type, number of lanes, and condition (PASER rating). Each segment of federal aid road in the county must be rated at least every two years. In most counties, half of the county is collected every other year.

Treatments

Applying a rating system like PASER to a paved network of roads allows for an efficient way to inventory and evaluate those 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 intensive the 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. Roads rated 5 - 7 require capital preventative maintenance such as chip seal or non-structural overlay. If the roadway deteriorates past a 4 on the PASER scale, capital preventative maintenance methods of treatment are not effective. A road rated 1-4 on the PASER scale requires some form of structural improvement or full reconstruction.

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 or newly constructed more than 1 year ago
8 **Good**	Few if any longitudinal cracks and then only on paving joints. Occasional transverse cracks, widely spaced (40' or greater). All cracks sealed or tight.	Recent sealcoat on pavement over a year old or new cold mix. Little or no maintenance required.
7 **Fair**	Very slight or no raveling, surface shows some traffic wear. Transverse cracks open less than 1/4", spaced 10' to 40' apart, little or no crack erosion. Few if any patches in good condition.	First signs of aging. Maintain with routine crack filling.
6 **Fair**	Slight raveling, polishing or flushing. Transvers cracks, open 1/4"–1/2", spaced six to ten feet apart. First sign of block cracking – blocks are large and stable. Occasional patching in good condition.	Shows signs of aging. Sound structural condition. Could extend life with sealcoat.
5 **Fair**	Moderate to severe raveling. Longitudinal and transverse cracks open greater than 1/2". Secondary cracking. First signs of longitudinal cracks near pavement edge. Moderate block cracking (1' – 5' blcoks). 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

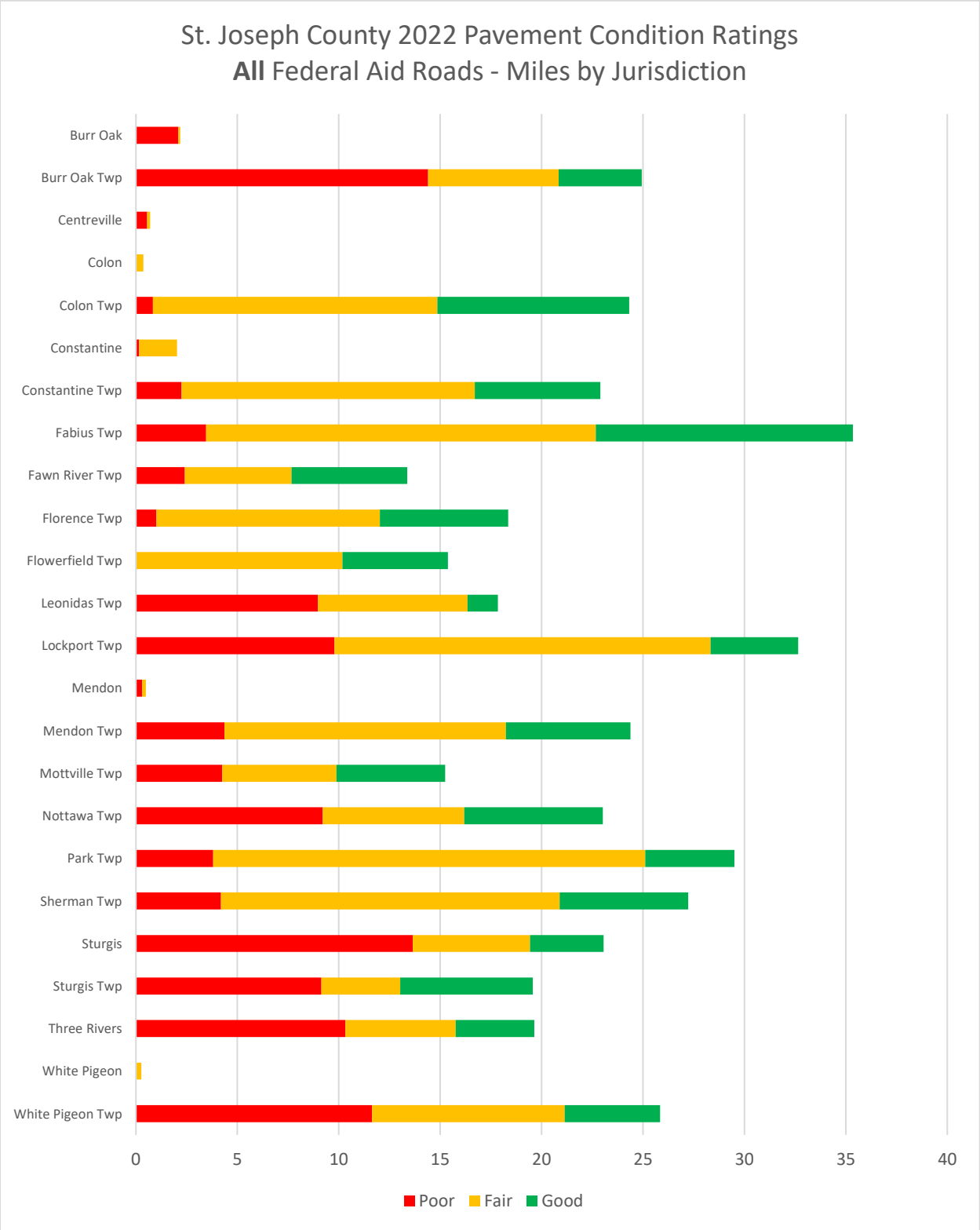
Treatment	Life Extension (Average Years)	PASER Rating	Cost per Mile	Average Cost per Additional Year
Overband Crack Filling	4	6 to 7	$15,000	$3,750
Fog Seal Coat	4	5 to 7	$5,000	$1,250
One Course Non-Structural Overlay	7	5 to 6	$60,000	$8,571
Single Course Chip Seal	6	5 to 7	$15,000	$2,500
Double Course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

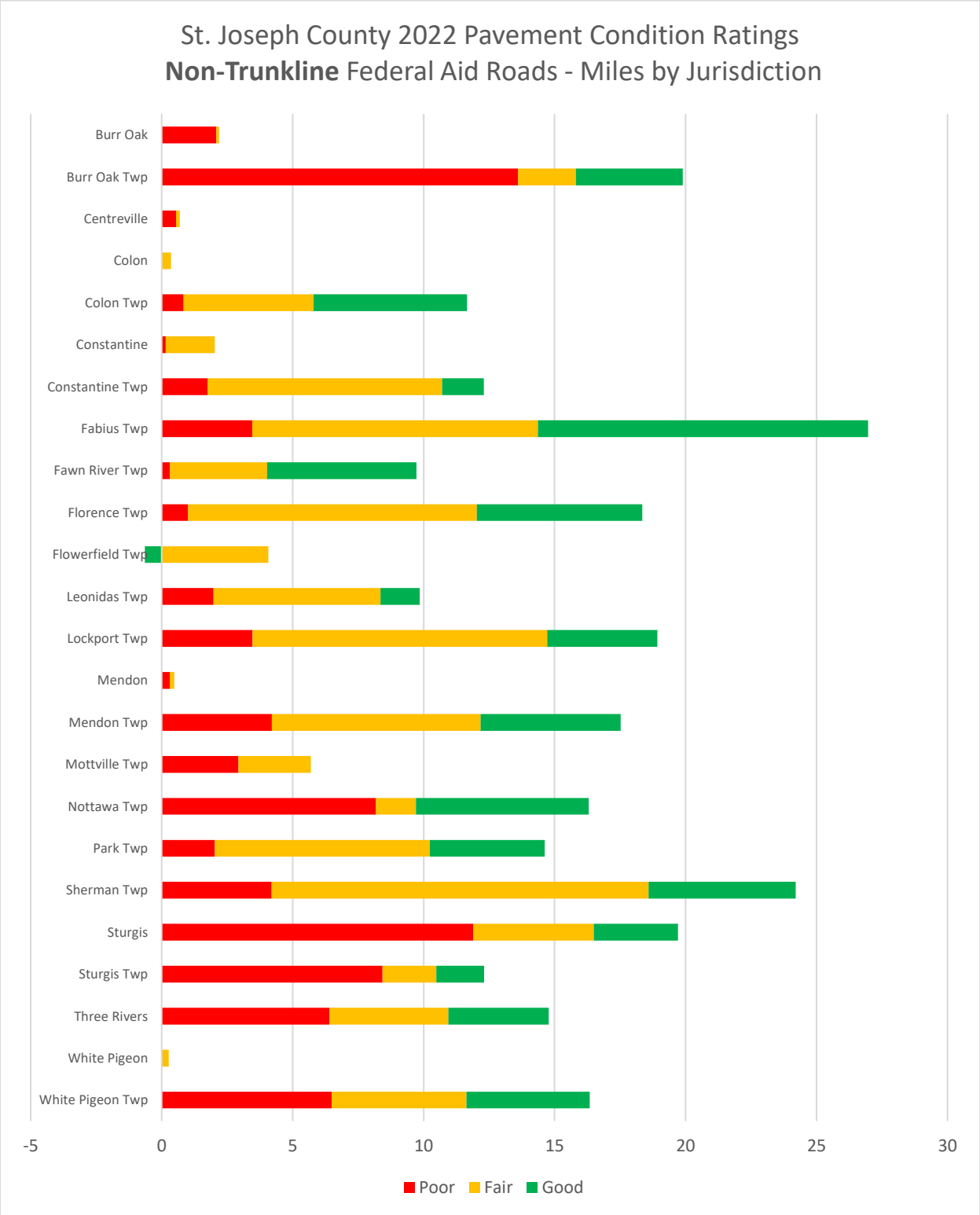
Capital Preventative Maintenance and Reconstructive Treatments

Table 2 details historical cost, lifespan, and rating of pavement treatment types that have been used in St. Joseph County. These treatments range from the minimal (overband crack filling) to major construction. As noted, these treatments and costs are historical and may not reflect newer technologies or current economic conditions; as new technologies emerge and become adopted some of them may be amended or superseded. The following list provides a brief overview of each treatment:

- Overband Crack Filling is used on cracks that are up to 1" wide and are moving or unmoving. The process is done by pouring hot rubber material into and over cracks to seal them from water intrusion.
- Fog Seals provide a thin asphalt coating over existing pavement. This treatment seals aggregate in place and prevents water permeation and oxidation of the asphalt binder.
- Non-Structural Overlays do not contribute to a pavement's structural capacity. These treatments use thin layers of asphalt (1/2- 1 ½ inches) applied on top of existing pavement, with or without milling prior to placement. They improve surface ride quality and drainage and help seal the surface from water permeation and oxidation.
- Chip Seals consist of a thin layer of emulsified asphalt applied to the road surface, which is topped with an aggregate usually consisting of crushed stone or slag. The treatment seals the underlying asphalt from water permeation and oxidation, and provides a renewed, high friction driving surface.
- Cold In-Place Recycling involves the removal and pulverization of all or some of the existing asphalt surface. The prepared material is then mixed with an asphalt emulsion and used to repave the same road.

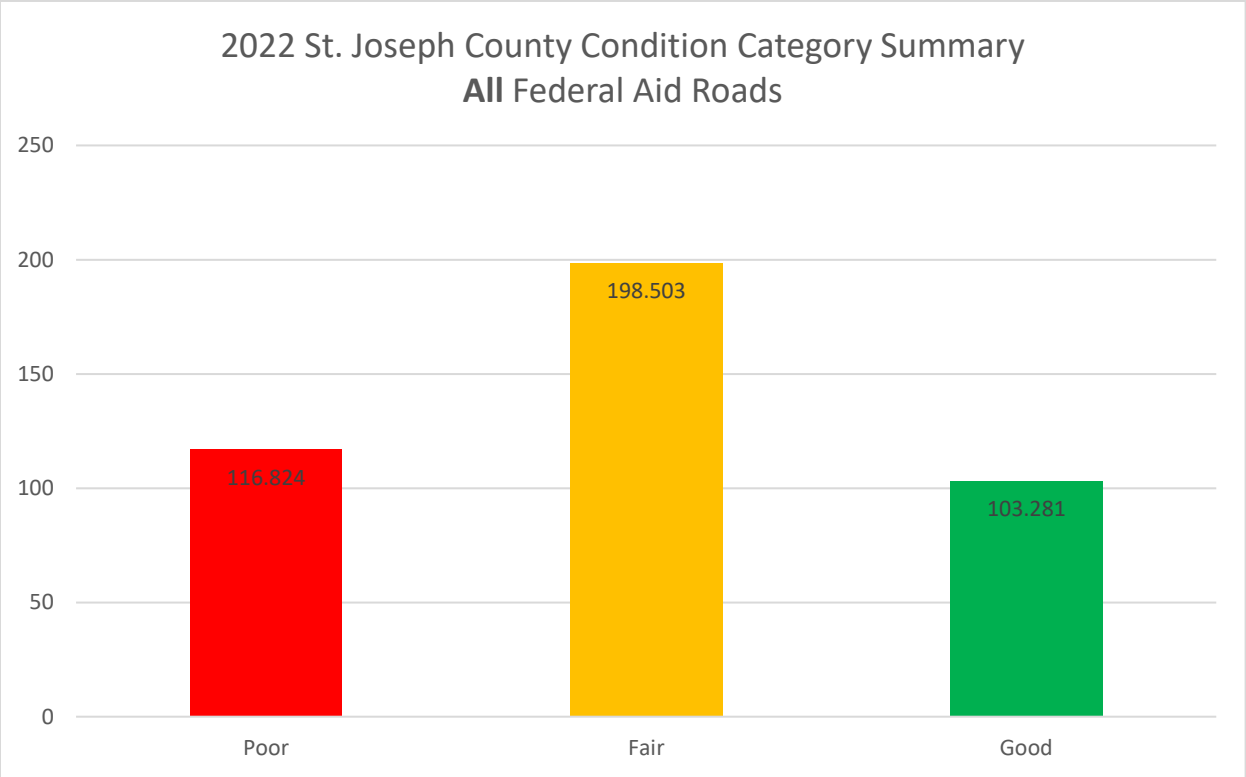
Summary of 2021 Ratings

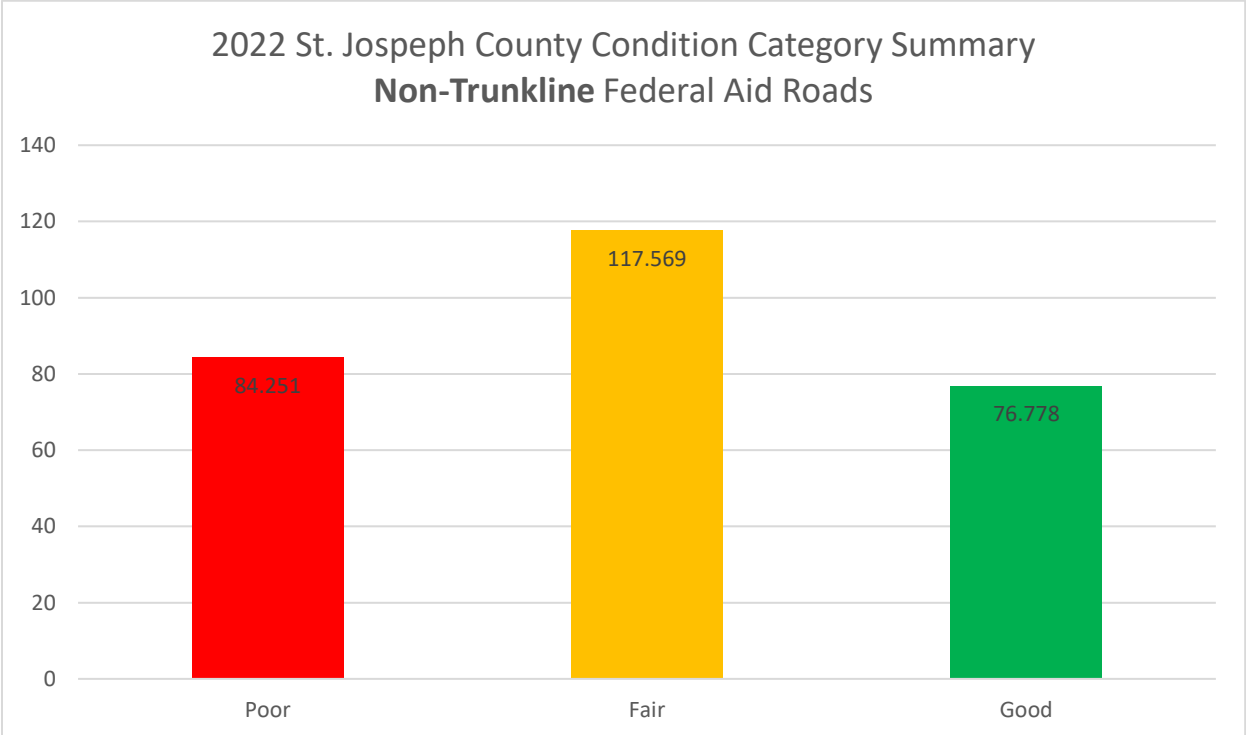



St. Joseph County 2022 Pavement Condition Ratings
Non-Trunkline Federal Aid Roads - Miles by Jurisdiction
Burr Oak
Burr Oak Twp
Centreville
Colon
Colon Twp
Constantine
Constantine Twp
Fabius Twp
Fawn River Twp
Florence Twp
Flowerfield Twp
Leonidas Twp
Lockport Twp
Mendon
Mendon Twp
Mottville Twp
Nottawa Twp
Park Twp
Sherman Twp
Sturgis
Sturgis Twp
Three Rivers
White Pigeon
White Pigeon Twp
-5
0
5
10
15
20
25
30
Poor
Fair
Good

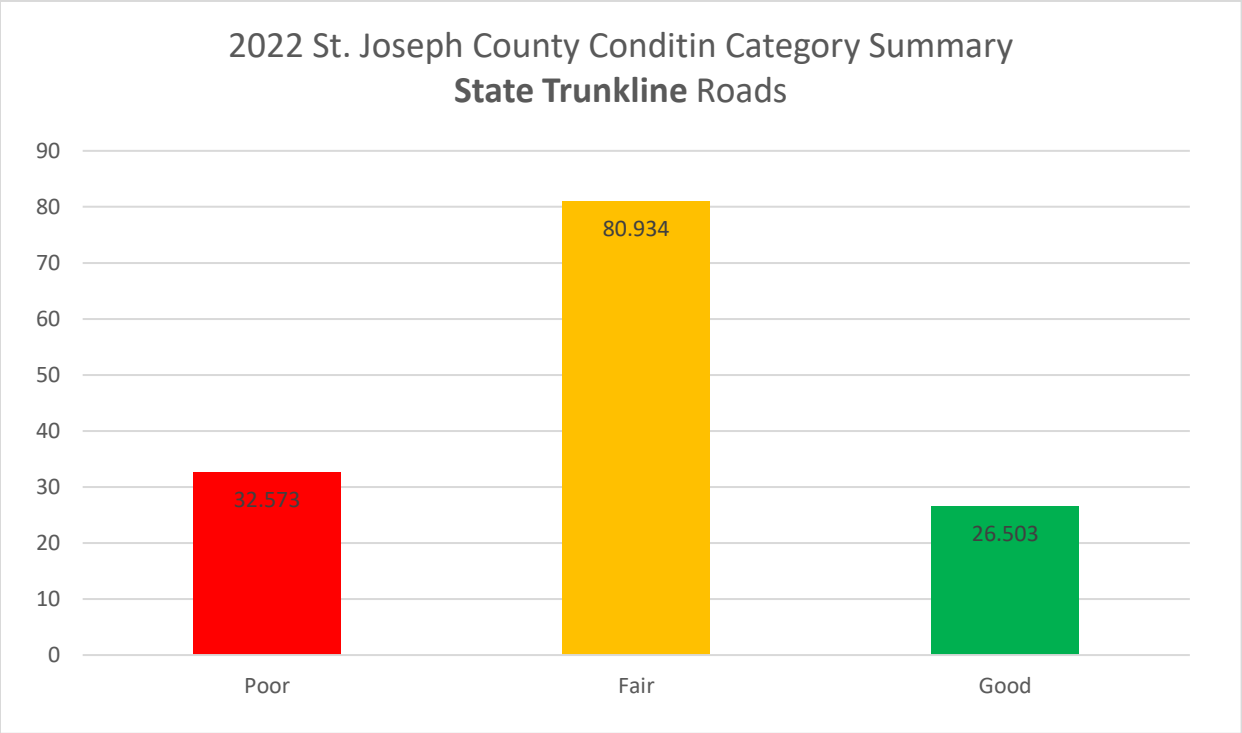

St. Joseph County 2022 Pavement Condition Ratings
State Trunkline Roads - Miles by Jurisdiction
White Pigeon Twp
Three Rivers
Sturgis Twp
Sturgis
Sherman Twp
Park Twp
Nottawa Twp
Mottville Twp
Mendon Twp
Lockport Twp
Leonidas Twp
Flowerfield Twp
Fawn River Twp
Fabius Twp
Constantine Twp
Colon Twp
Burr Oak Twp
0
2
4
6
8
10
12
14
16
Poor
Fair
Good

ROAD CONDITION REPORT FOR ST. JOSEPH COUNTY

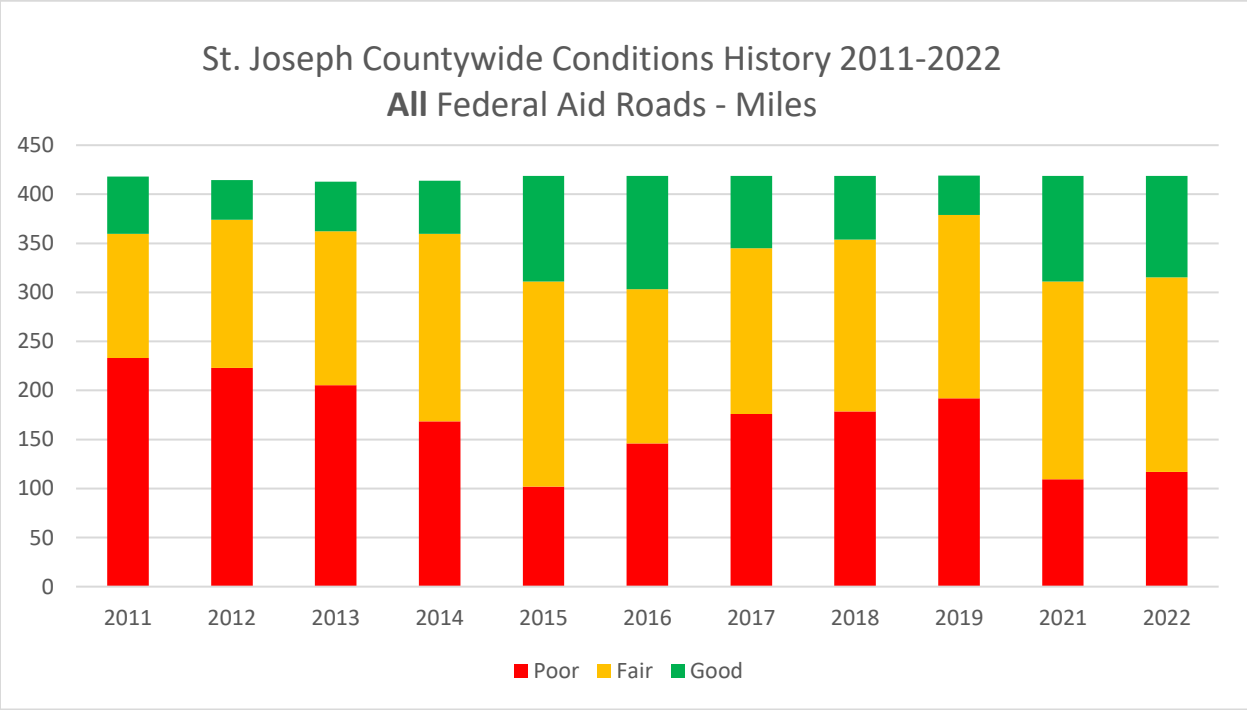


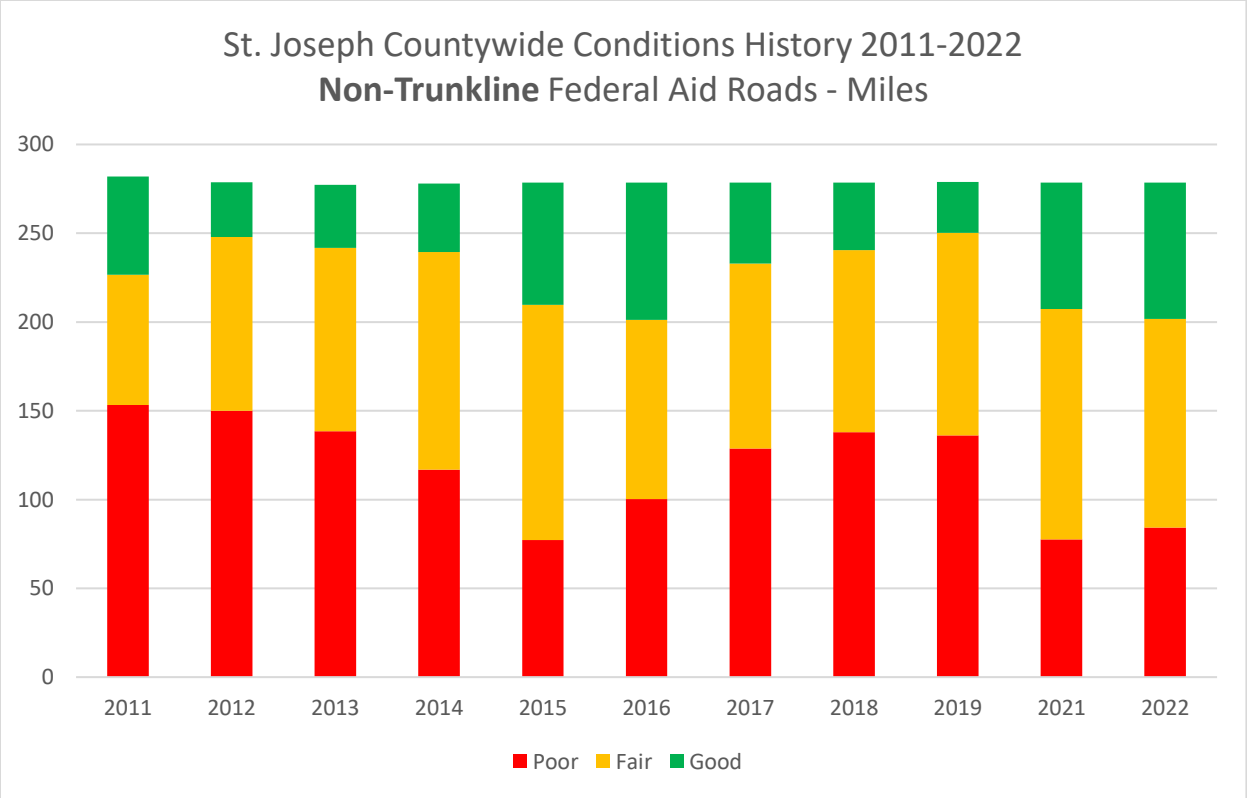


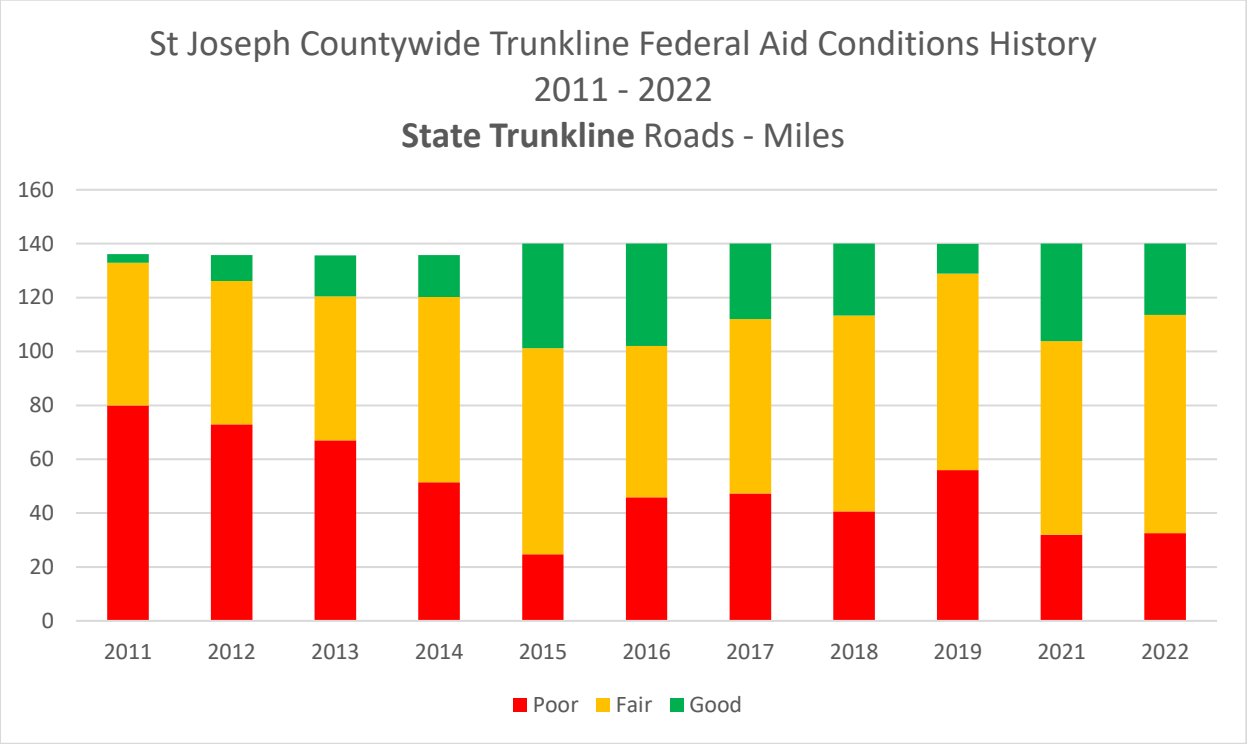
ROAD CONDITION REPORT FOR ST. JOSEPH COUNTY



Federal Aid Conditions History and Trends



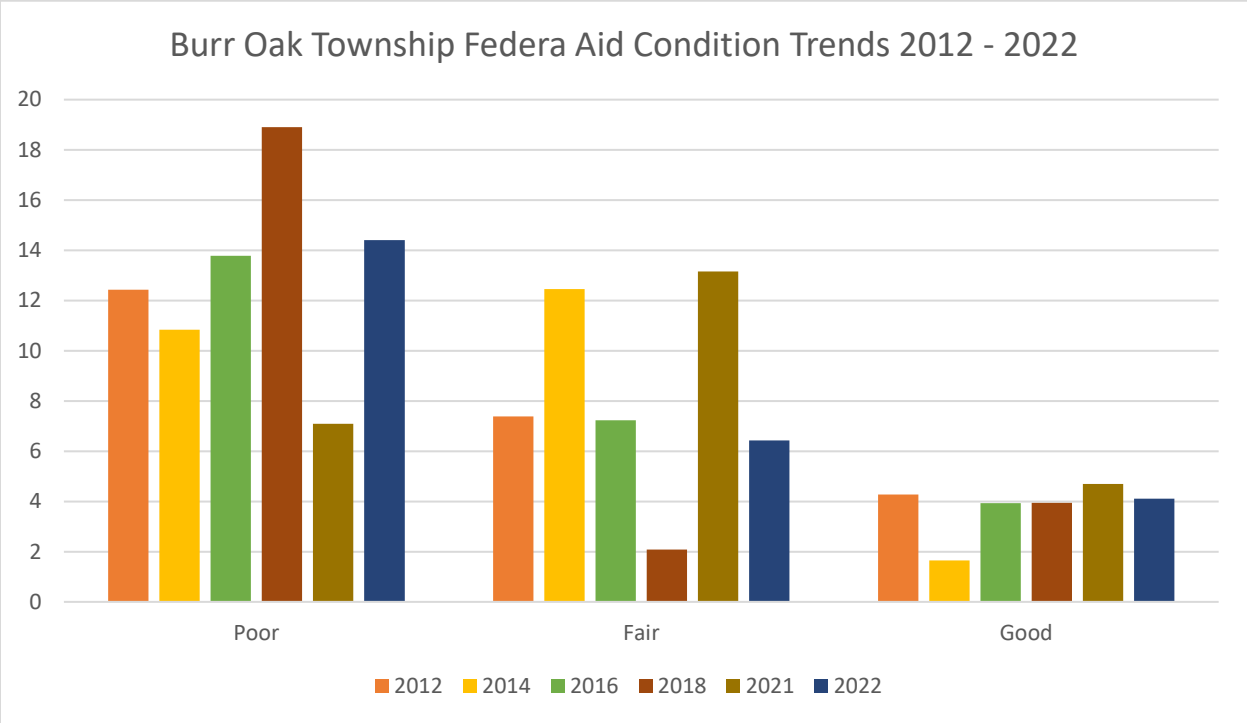


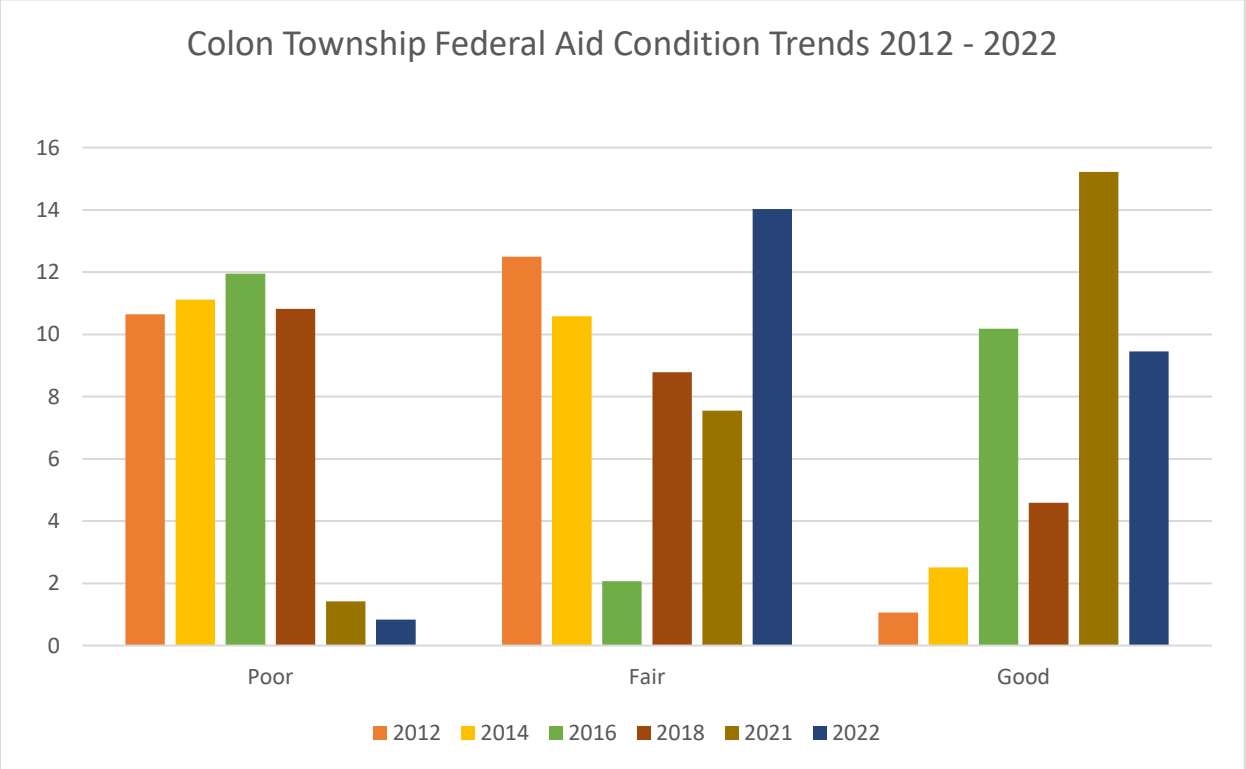


The charts above reflect the progression of St. Joseph County's federal-aid roads over an eleven-year period. From 2010 to 2015, there had been a steady reduction in the number of poor-rated miles with a corresponding increase in miles rated fair and good. Since then, in each successive two-year period there had been a slight increase in the number of miles rated Poor and a corresponding decrease in miles rated Good, while Fair rated mileage has held relatively steady. For 2021 the miles of Poor rated roads dropped significantly while Good rated mileage increased. The trend, while not exactly the same, is similar between trunkline and local roads This might suggest that more effort has been put into preventive maintenance efforts on appropriate candidates to prevent the fair to poor degradation while also increased emphasis was placed on addressing a backlog of roads in poor condition.

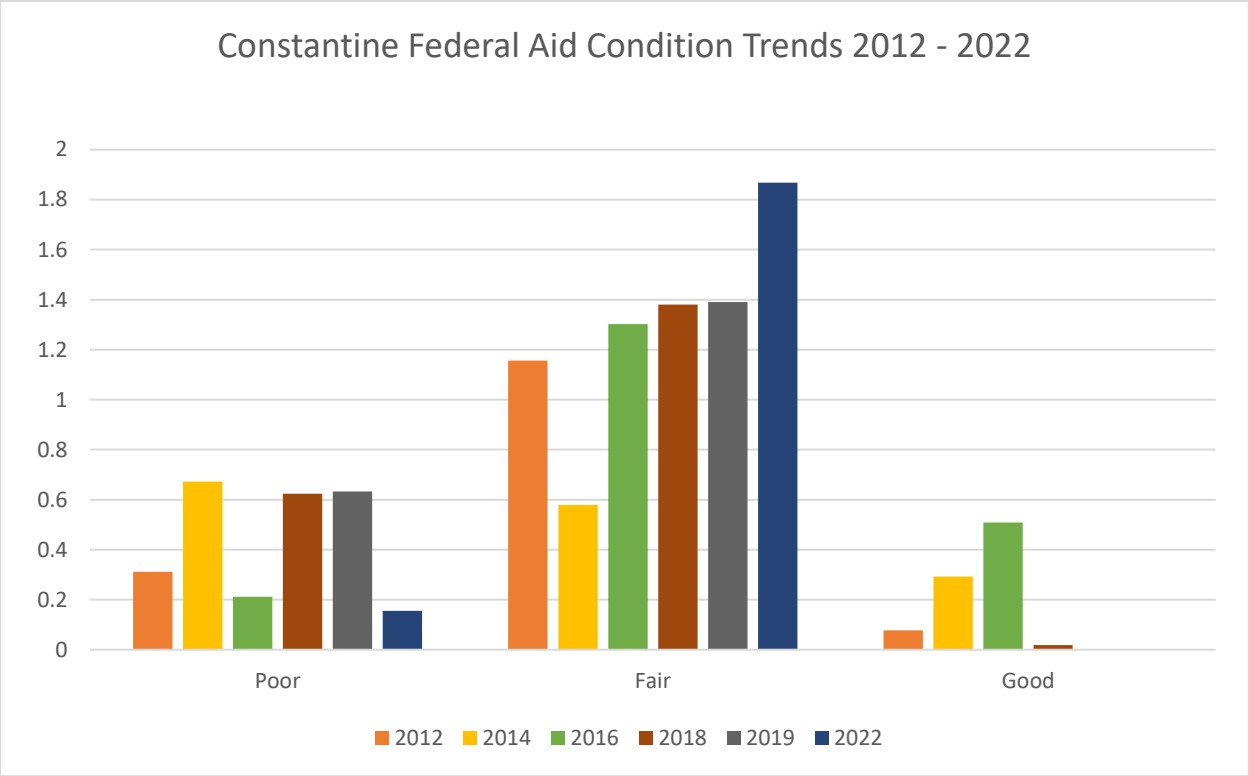
When looking at township breakdowns from 2021 on the following pages of this document, it is apparent that in most jurisdictions the majority of road miles are Fair or Poor, with Good constituting relatively few overall. This is the case for all federal aid roads, trunkline and non-trunkline alike, in St. Joseph County.

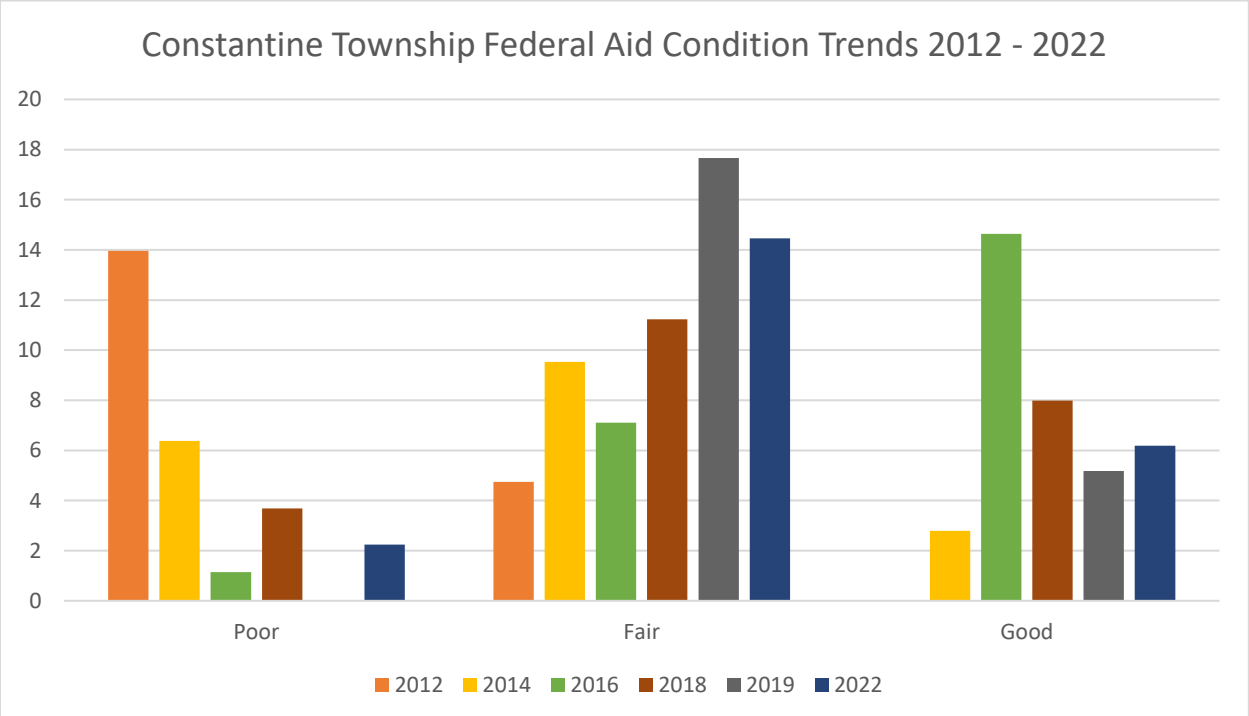
2010 – 2021 Federal Aid Road Condition Trends



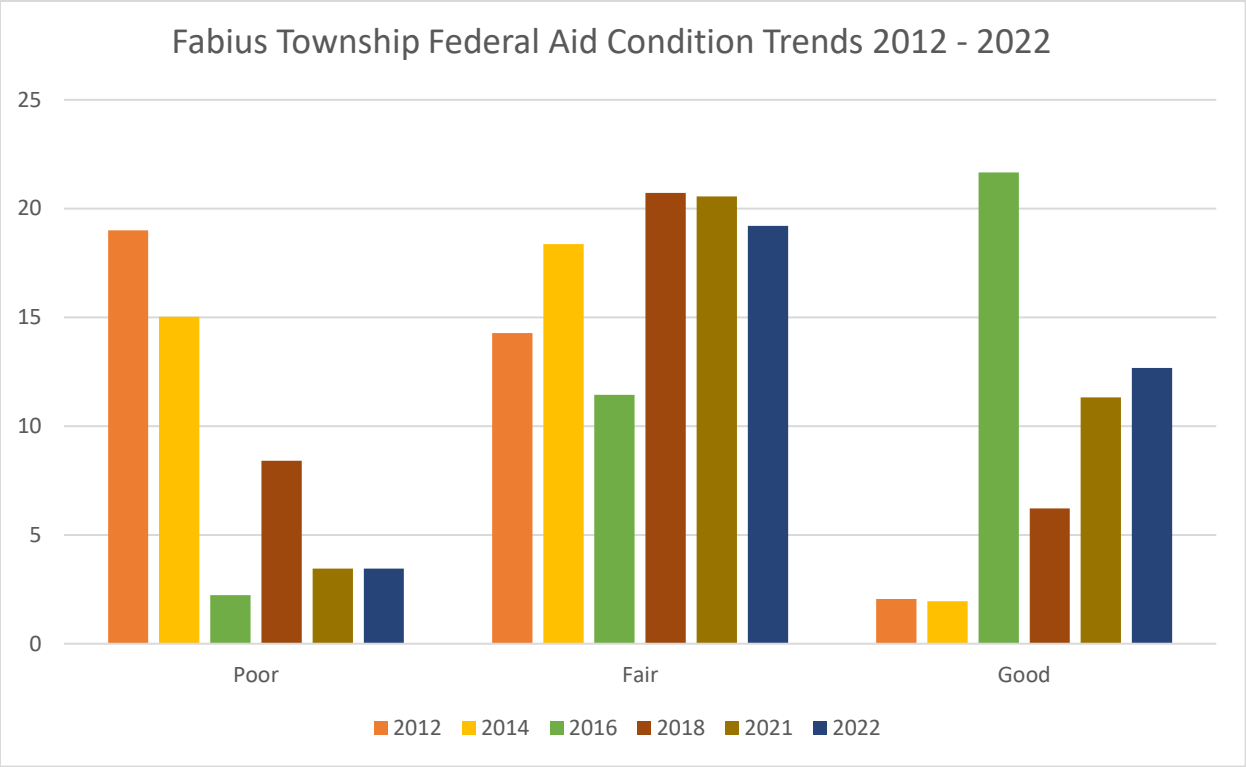


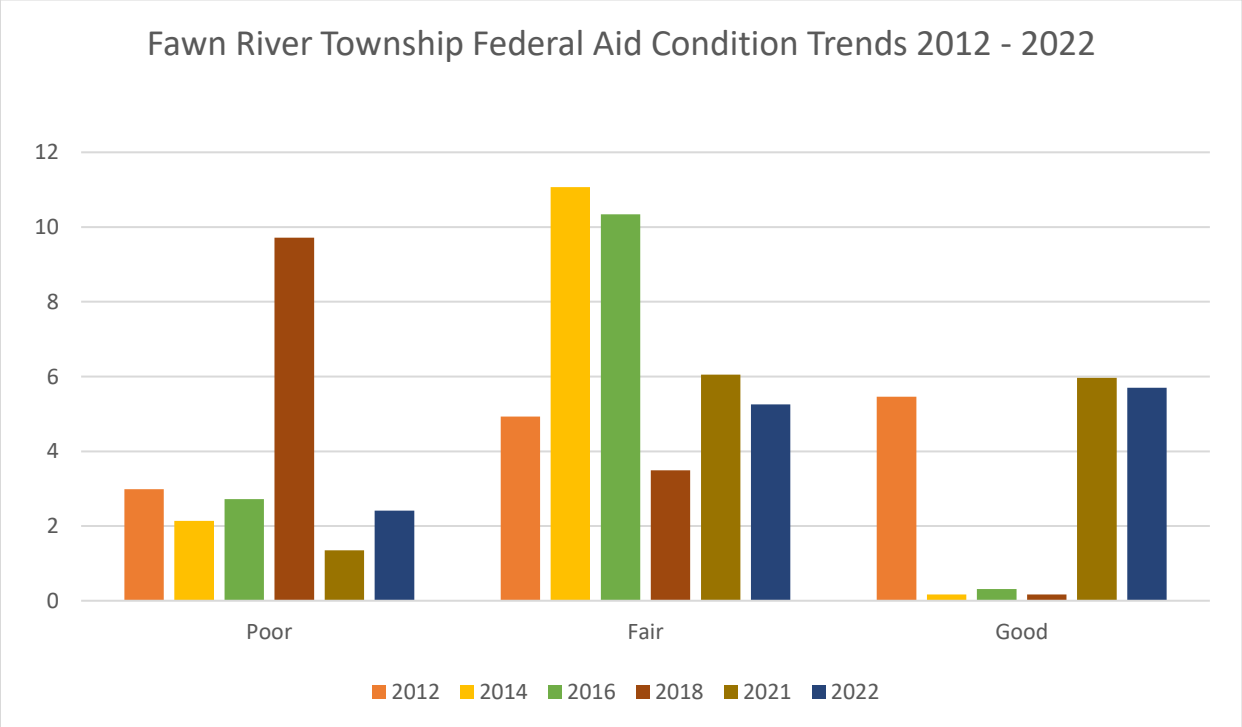
2010 – 2021 Federal Aid Road Condition Trends



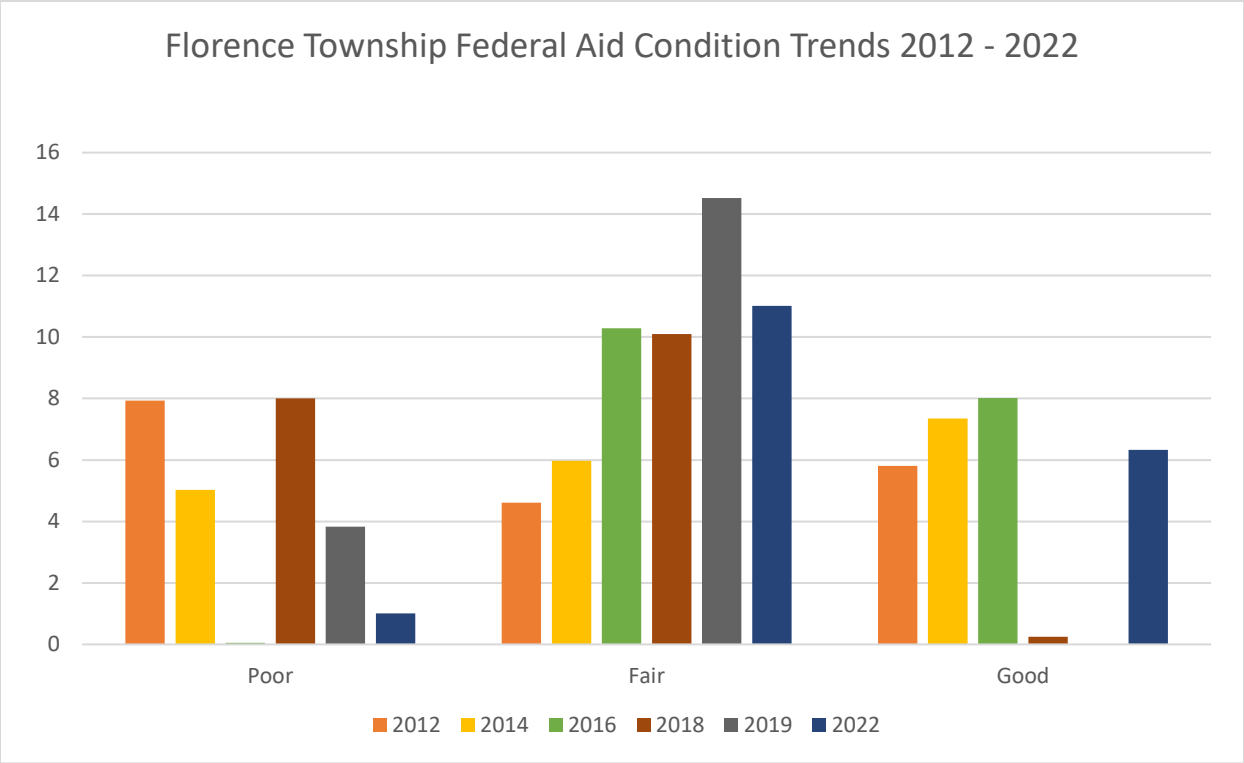


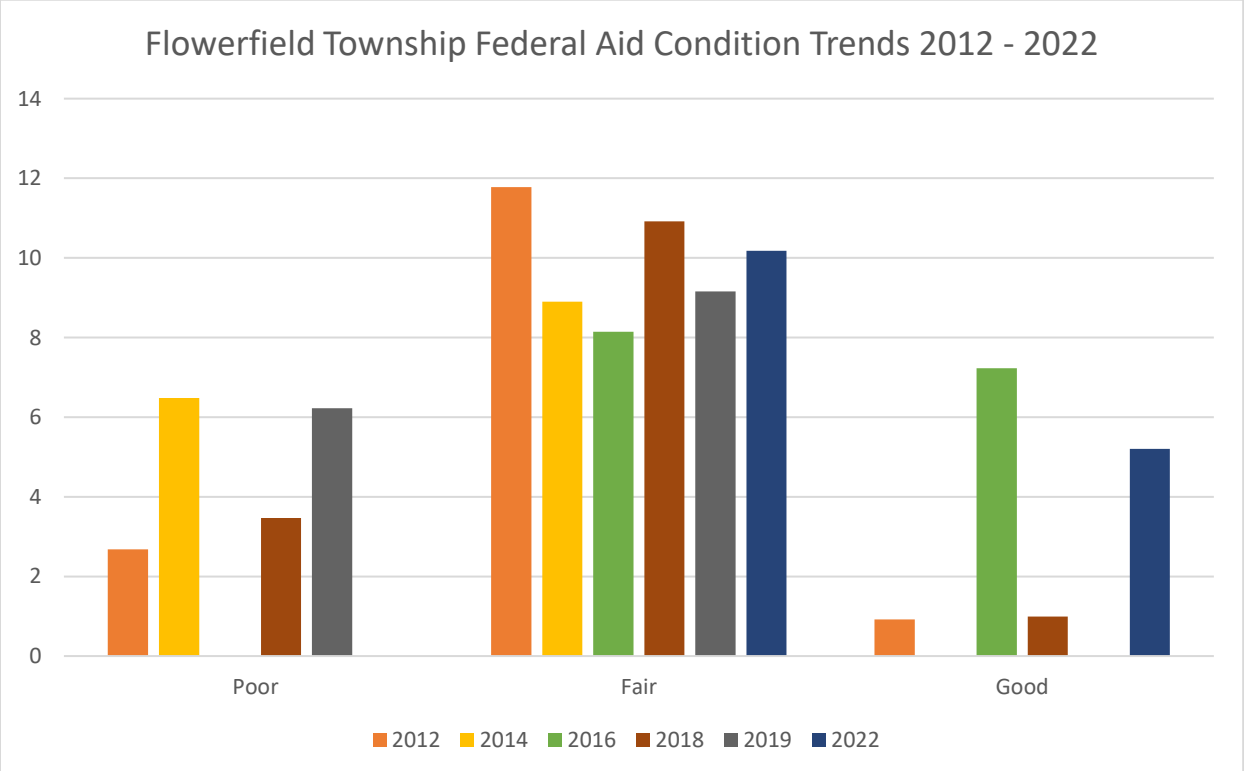
2010 – 2021 Federal Aid Road Condition Trends



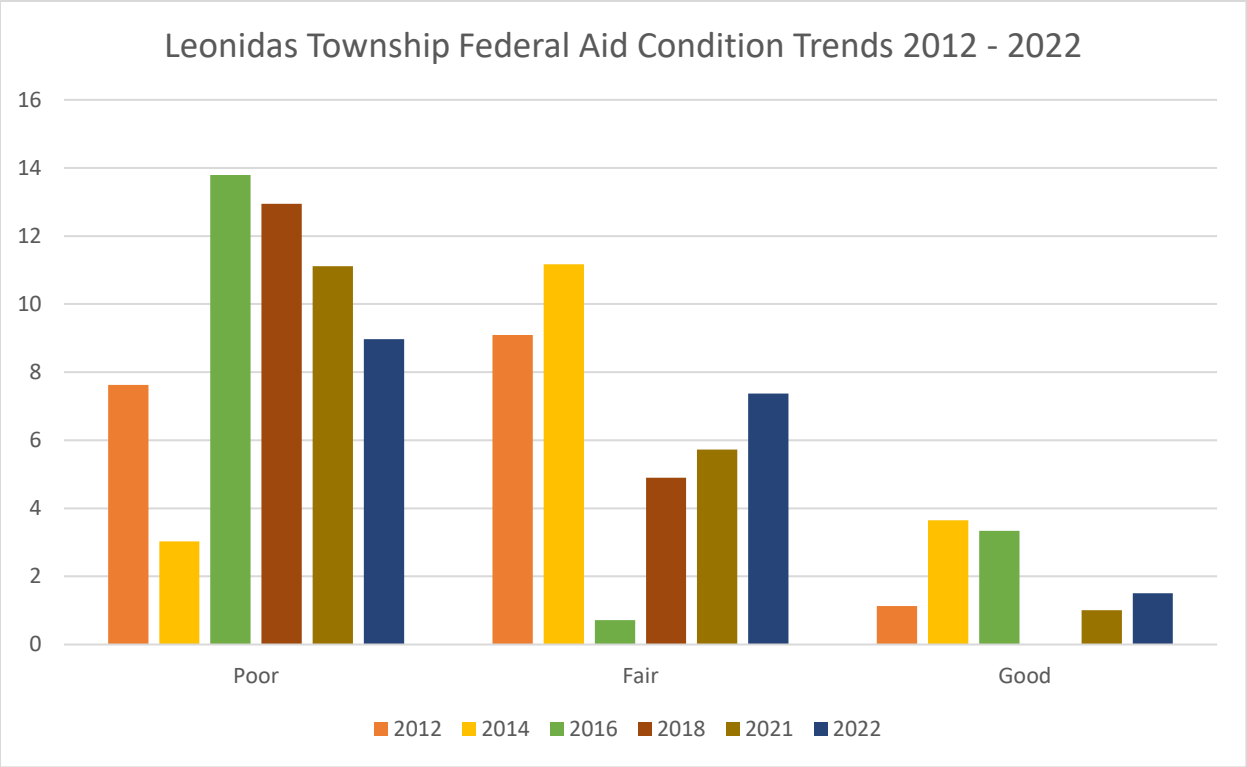


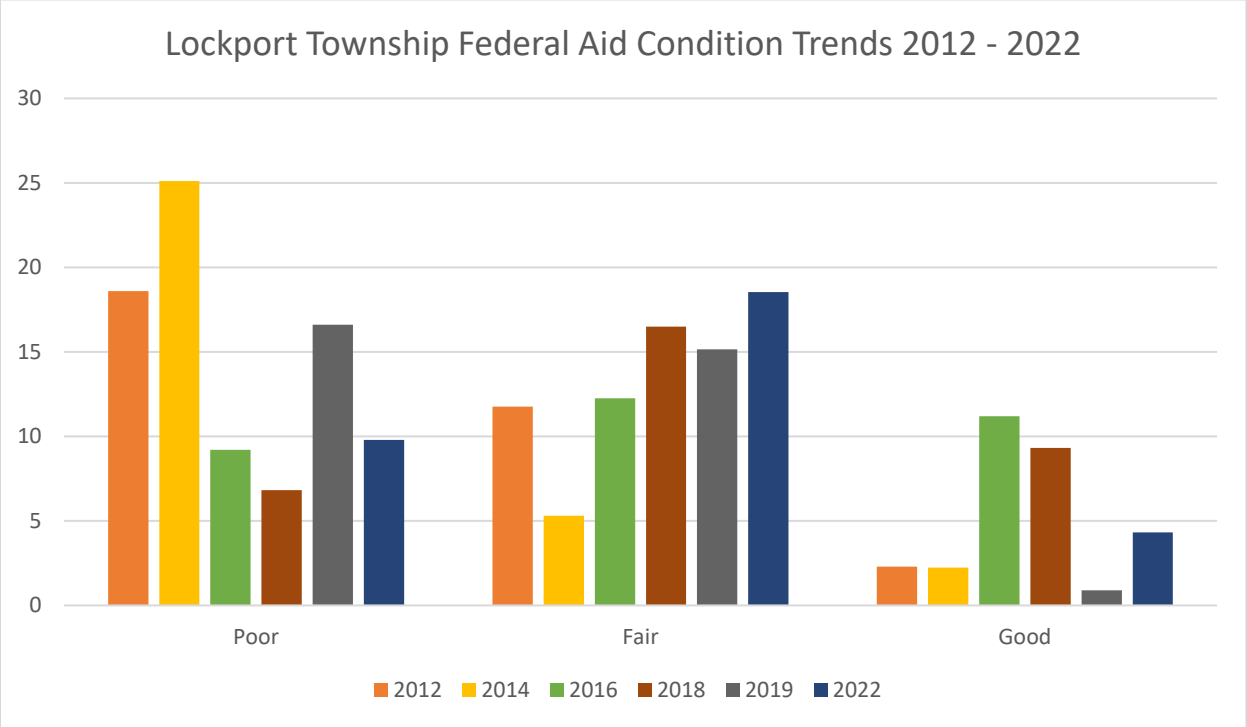
2010 – 2021 Federal Aid Road Condition Trends



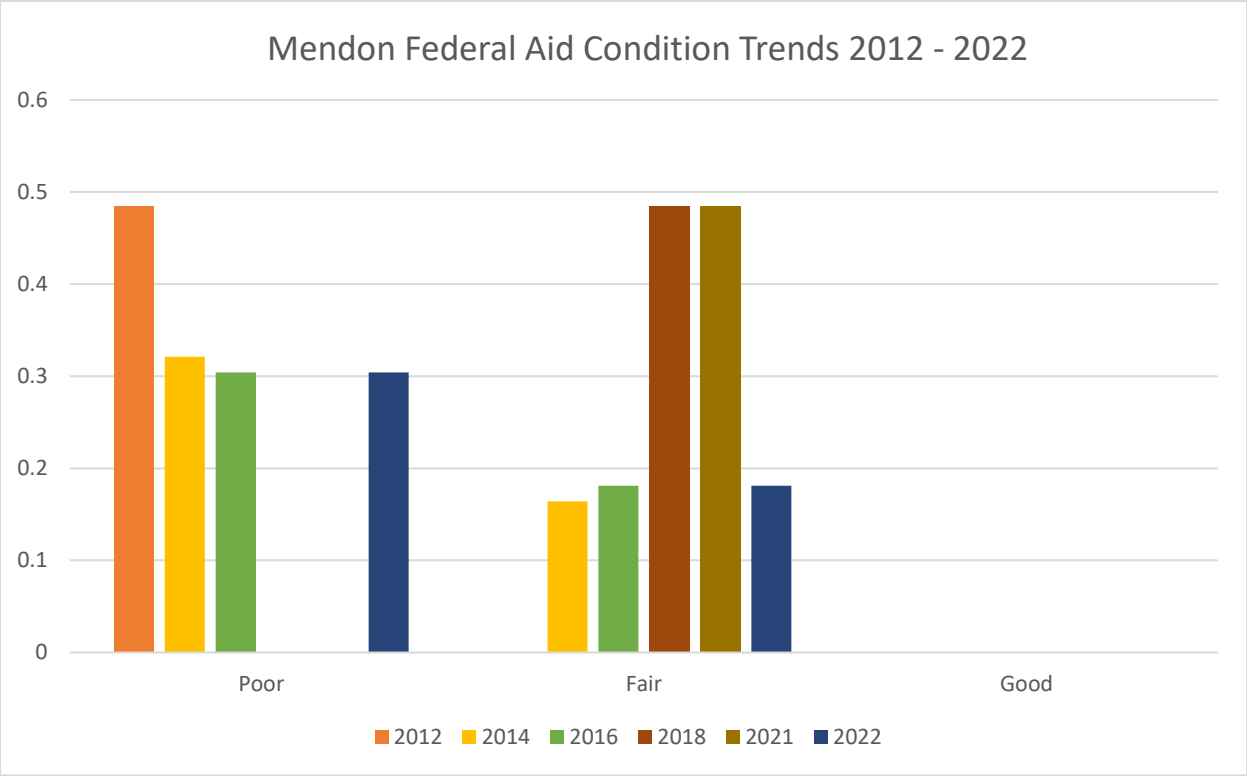


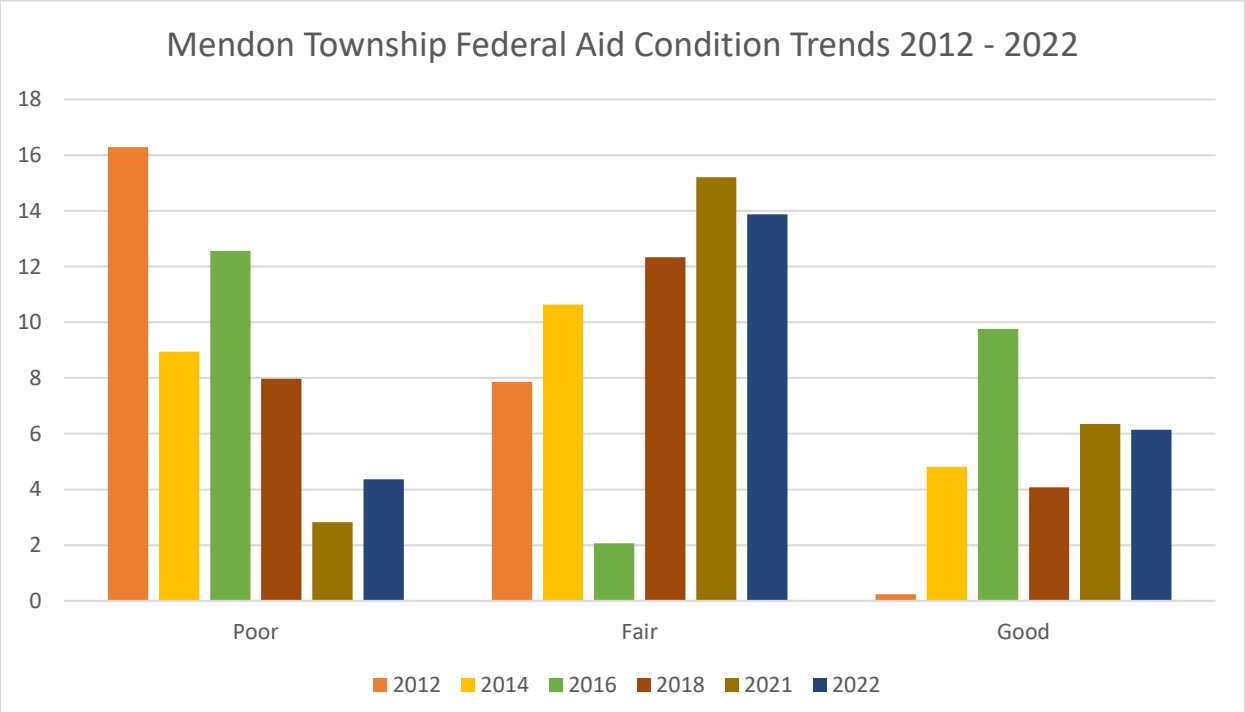
2010 – 2021 Federal Aid Road Condition Trends



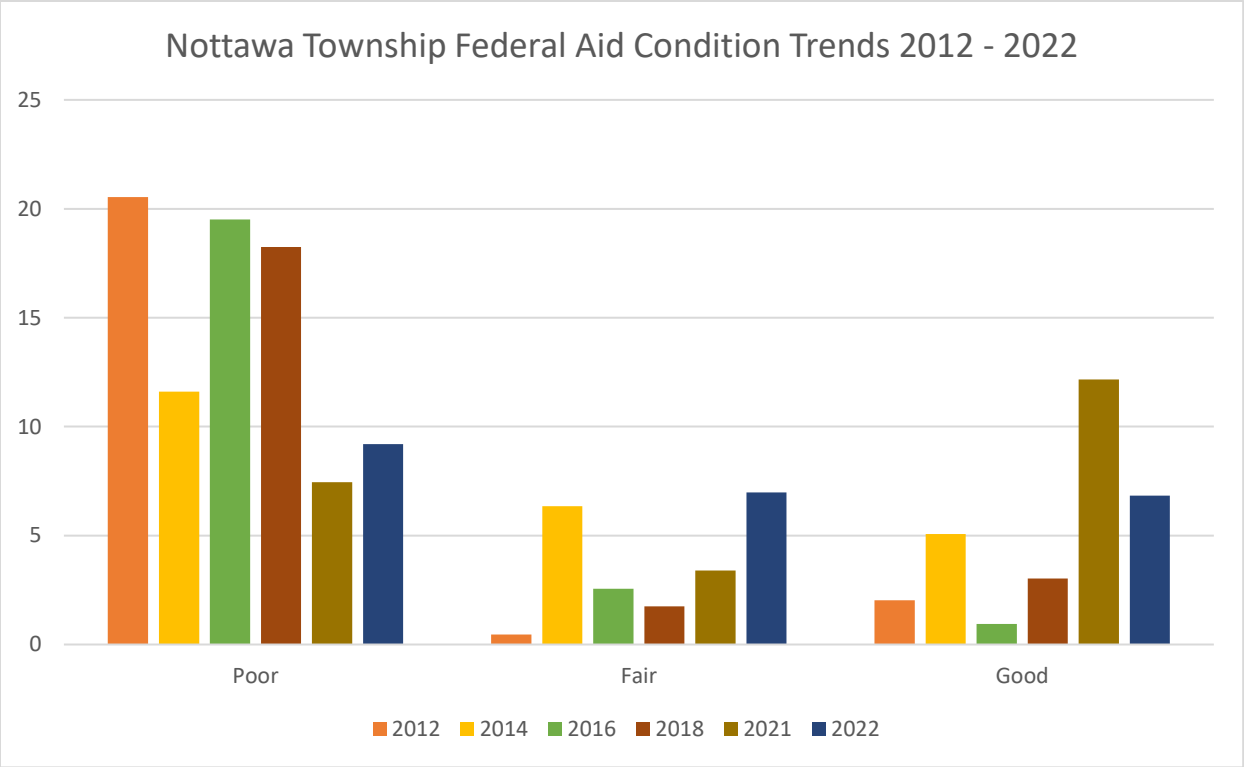


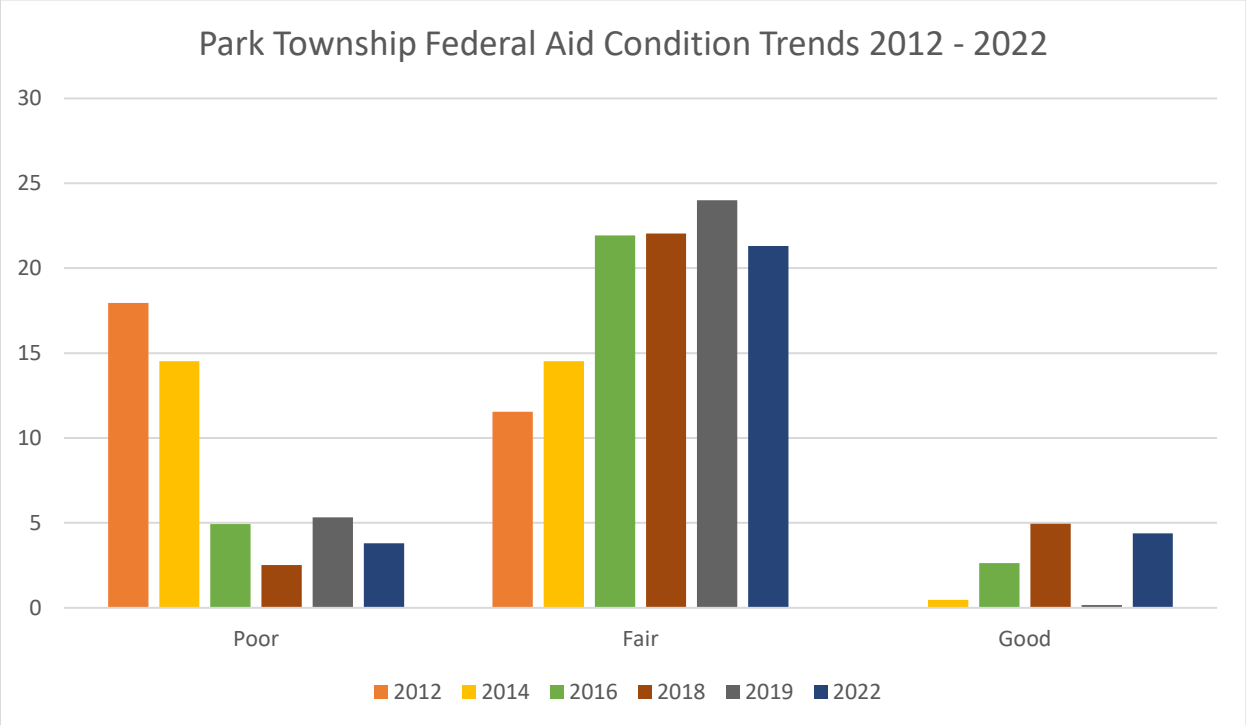
2010 – 2021 Federal Aid Road Condition Trends



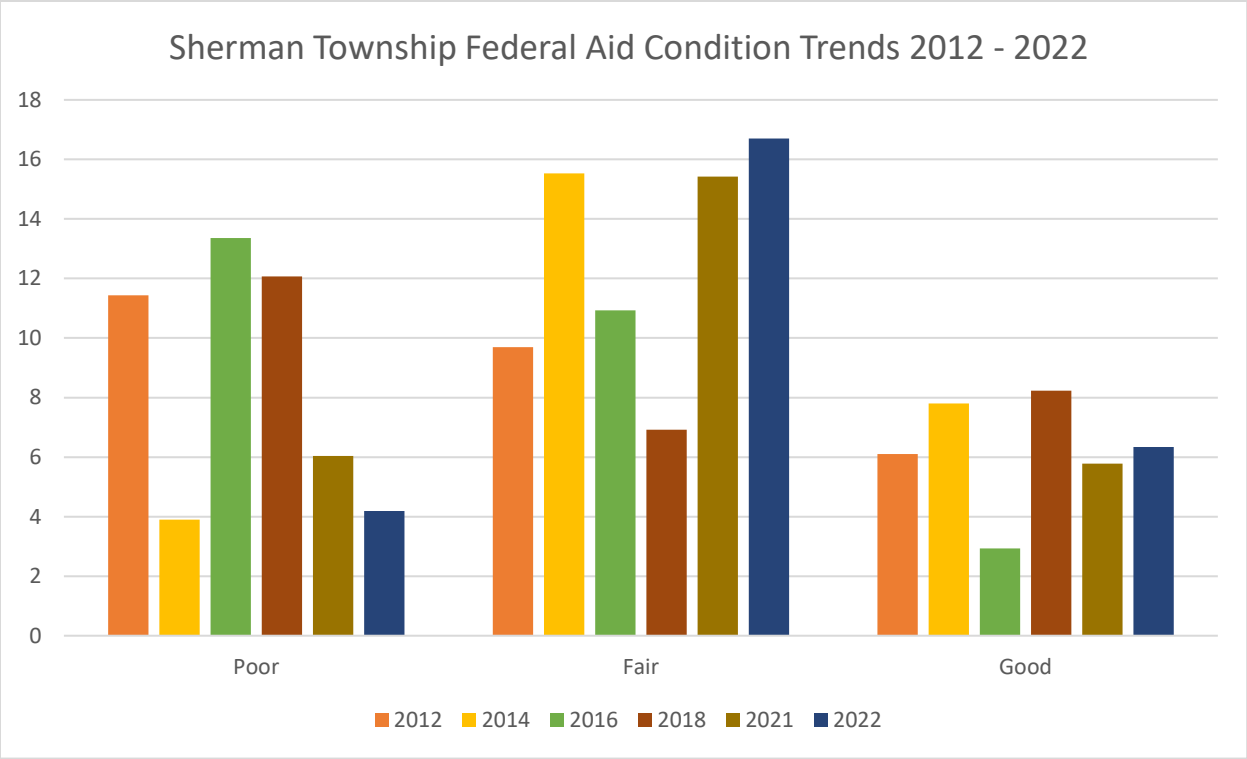


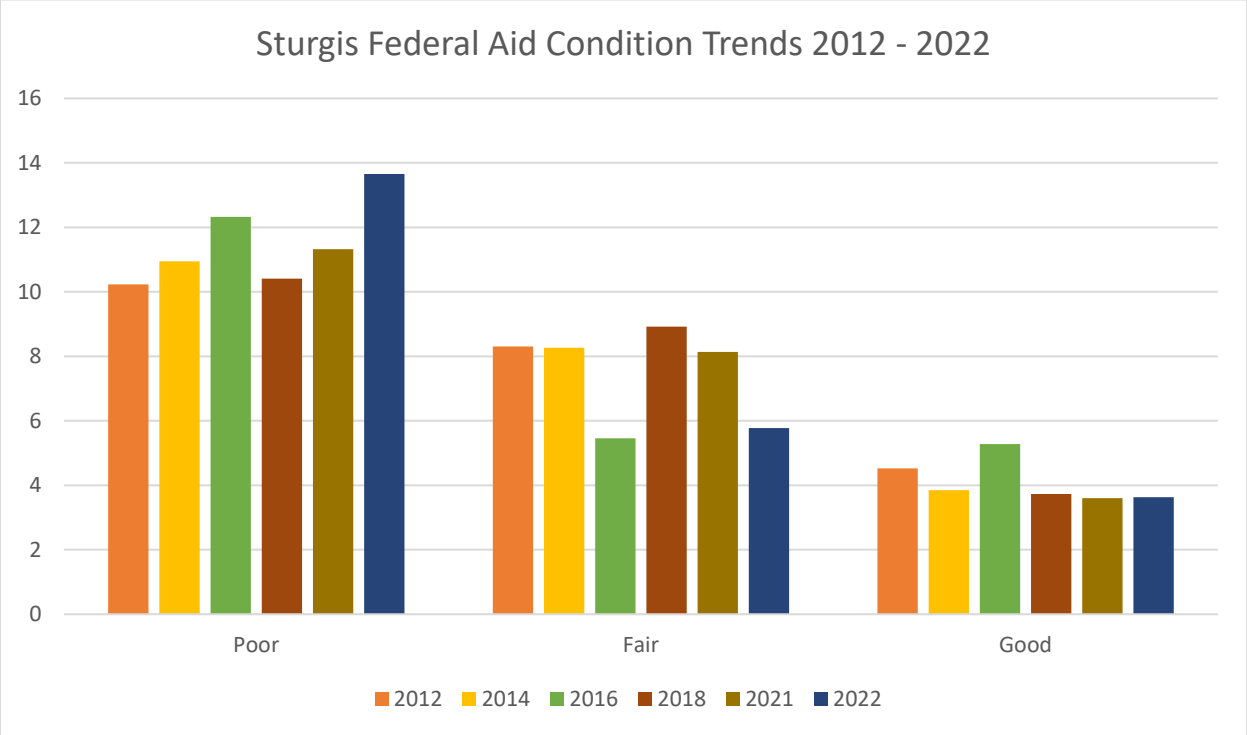
2010 – 2021 Federal Aid Road Condition Trends



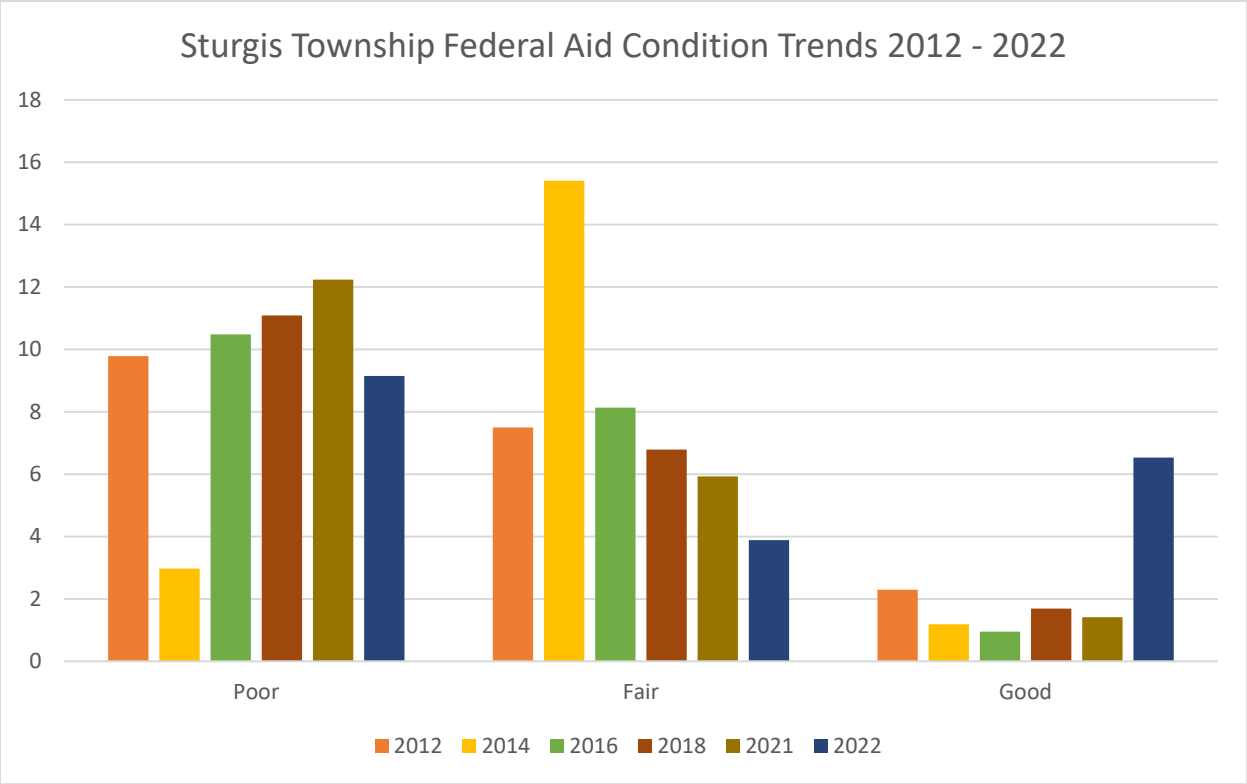


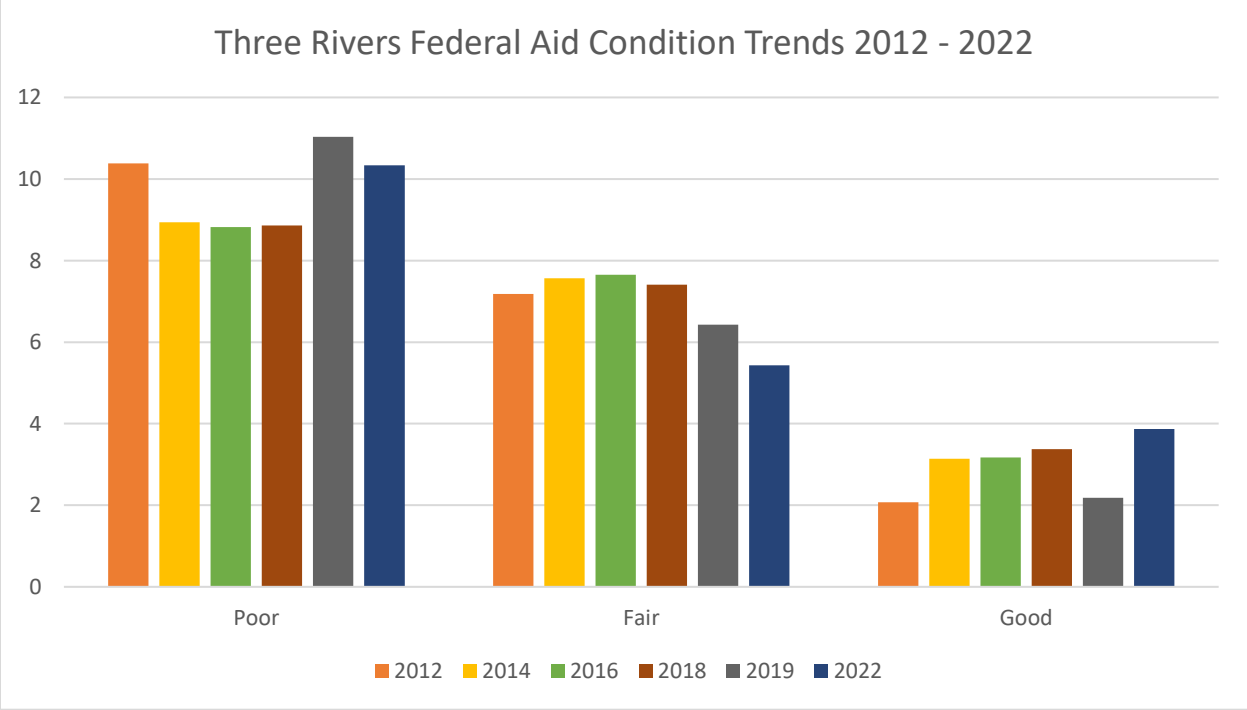
2010 – 2021 Federal Aid Road Condition Trends



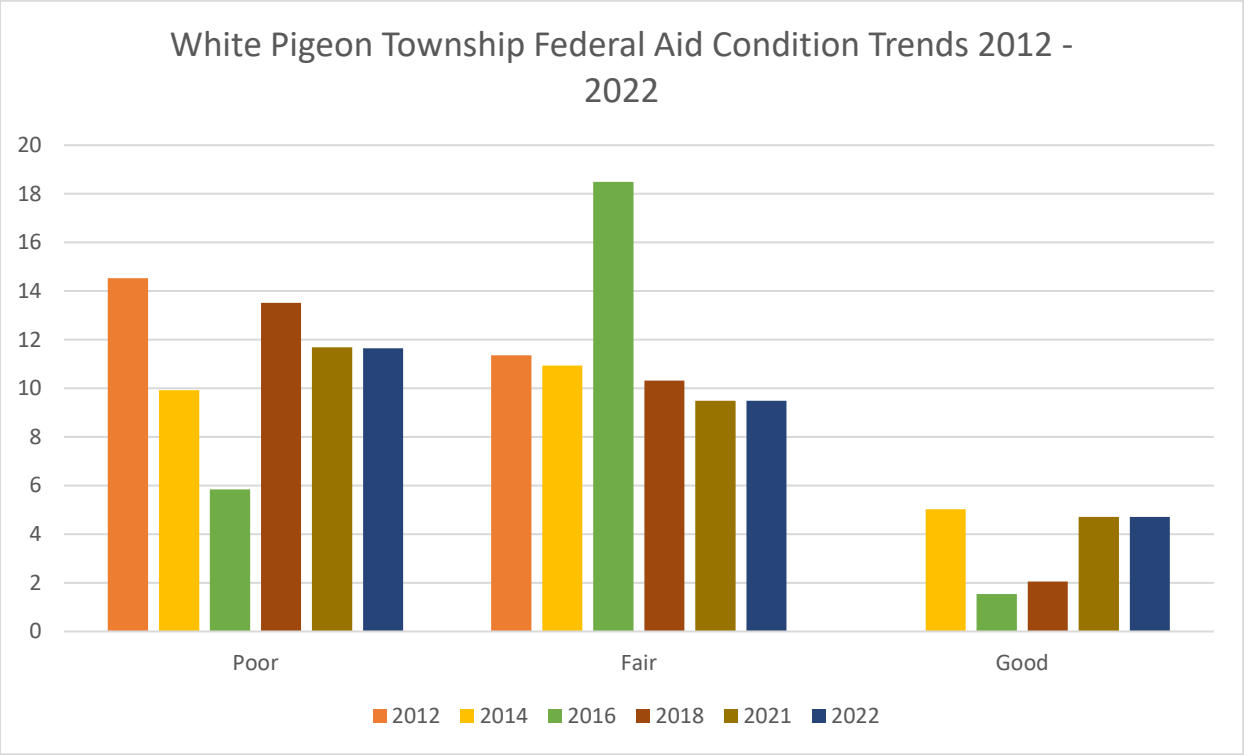


2010 – 2021 Federal Aid Road Condition Trends



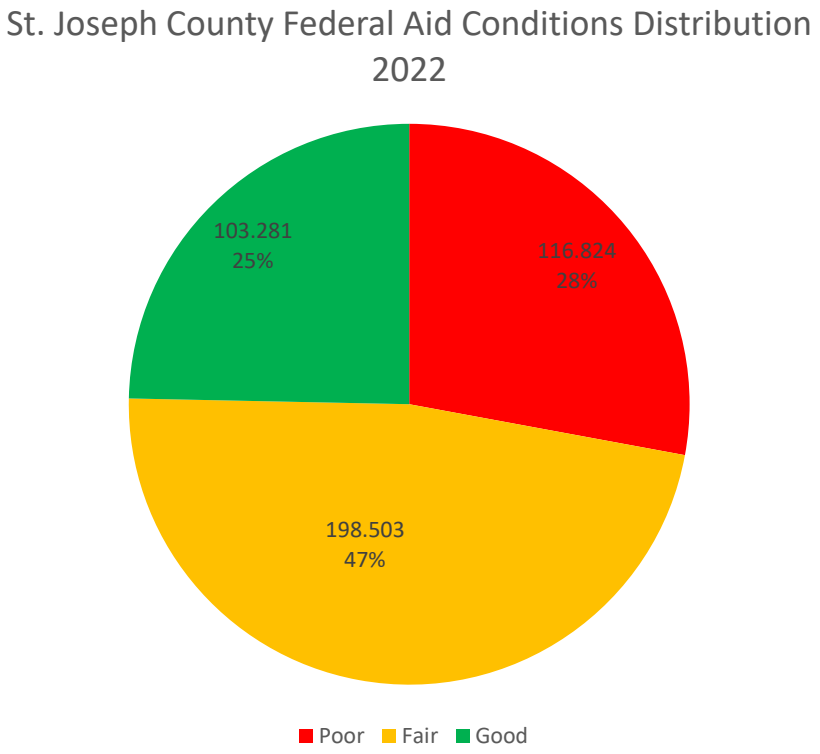


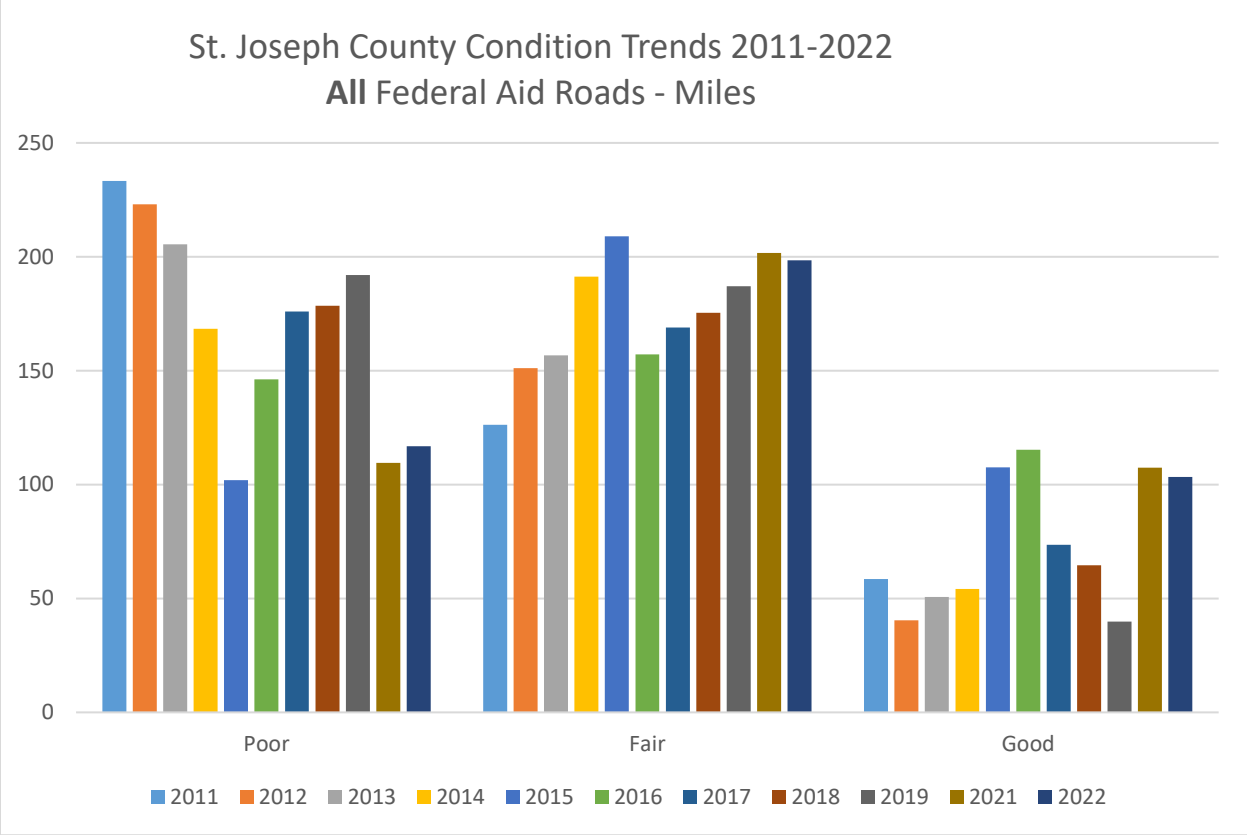
2010 – 2019 Federal Aid Road Condition Trends

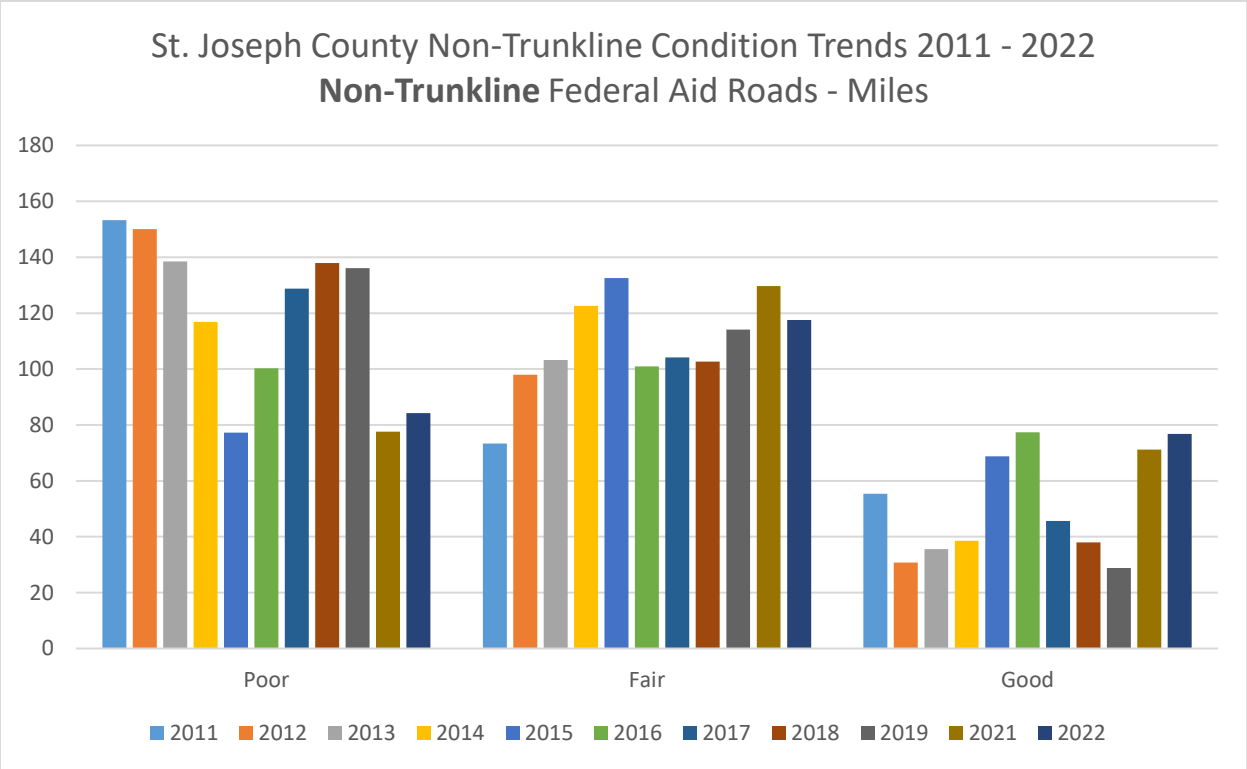


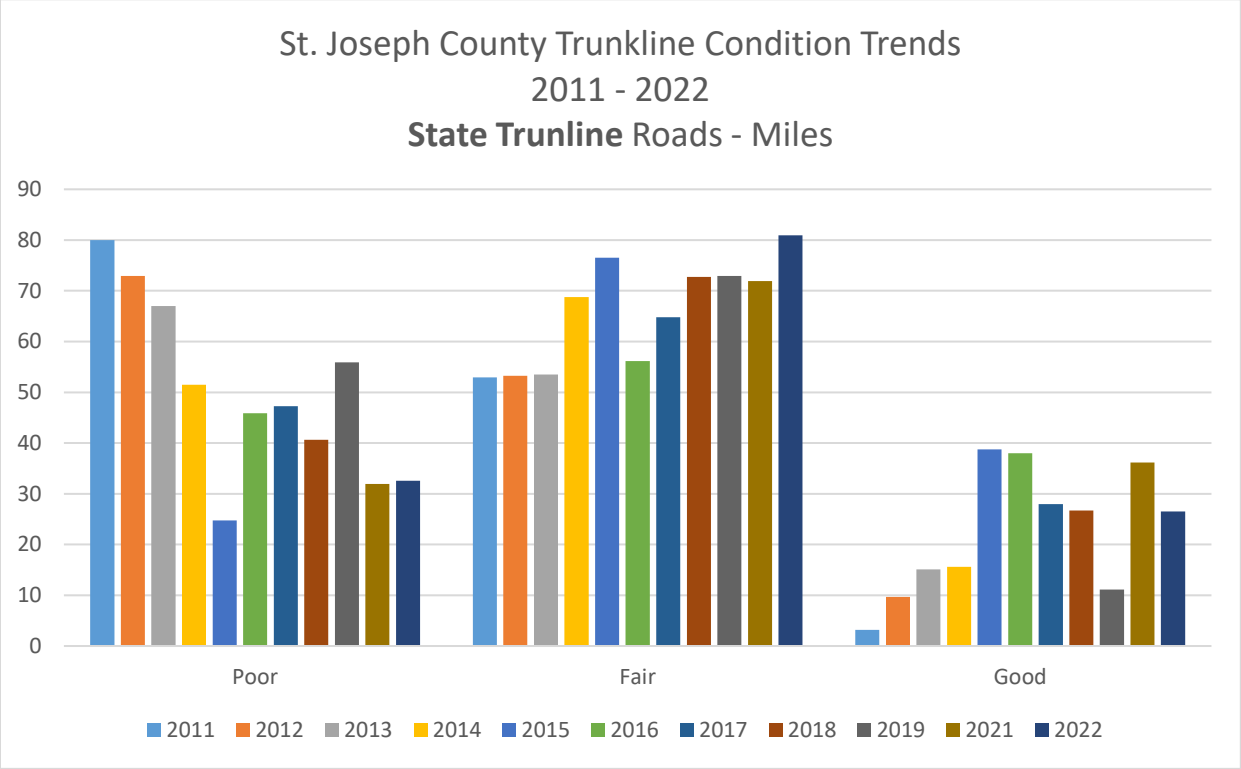
Pavement Condition Summary

Of the 419 miles of federal-aid roads rated in 2021, 110 miles are rated as being in "Poor" condition, 202 miles rated "Fair", and 107 miles "Good". This distribution means that currently just over half of the mileage of federal aid roads are rated fair or good but over 90% are rated Fair or Poor. The chart below illustrates the percentage distribution of road ratings




St. Joseph County Condition Trends 2011-2022
All Federal Aid Roads - Miles
250
200
150
100
50
0
Poor
Fair
Good
2011
2012
2013
2014
2015
2016
2017
2018
2019
2021
2022

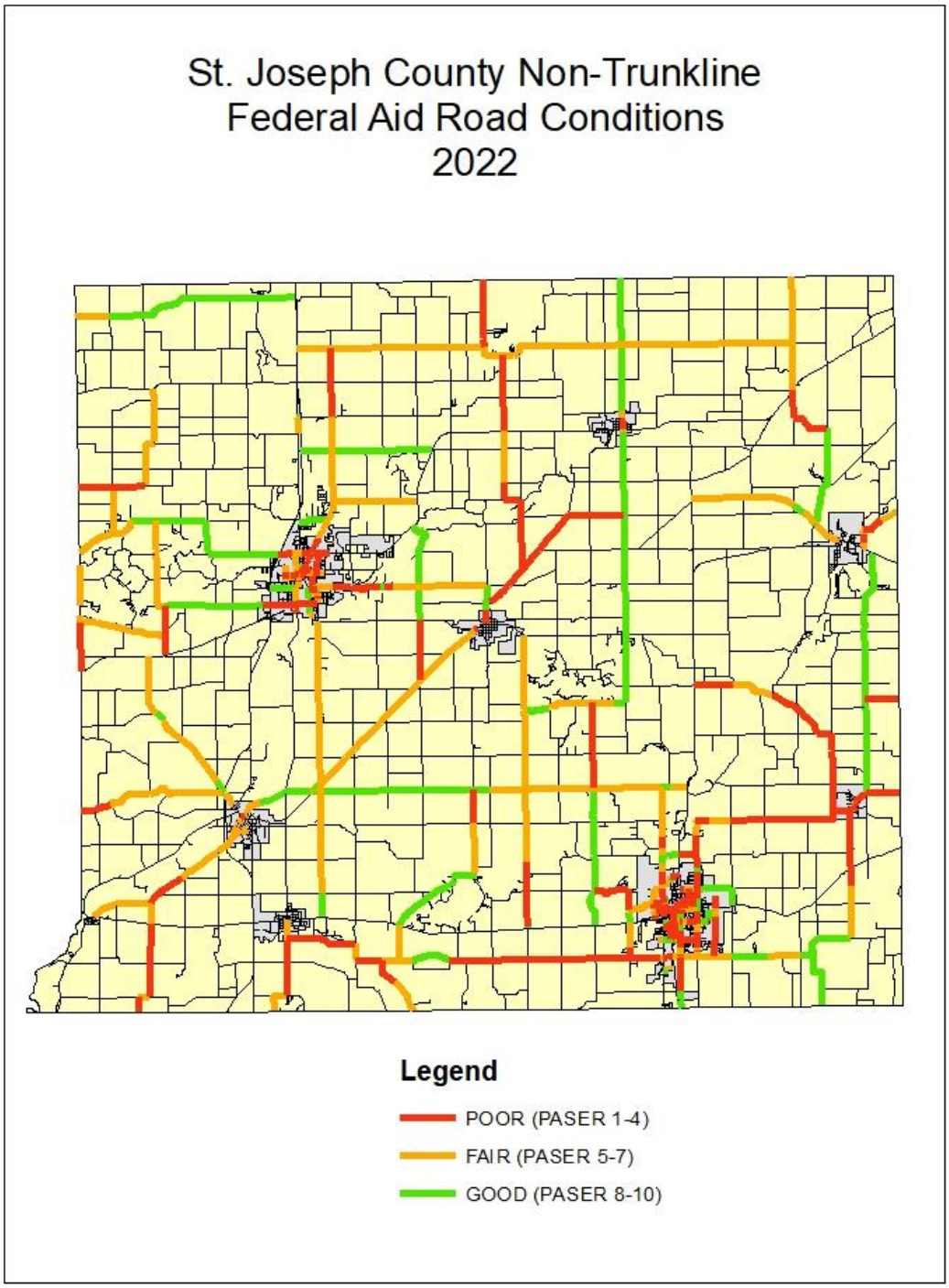

St. Joseph County Non-Trunkline Condition Trends 2011 - 2022
Non-Trunkline Federal Aid Roads - Miles
180
160
140
120
100
80
60
40
20
0
Poor
Fair
Good
2011
2012
2013
2014
2015
2016
2017
2018
2019
2021
2022

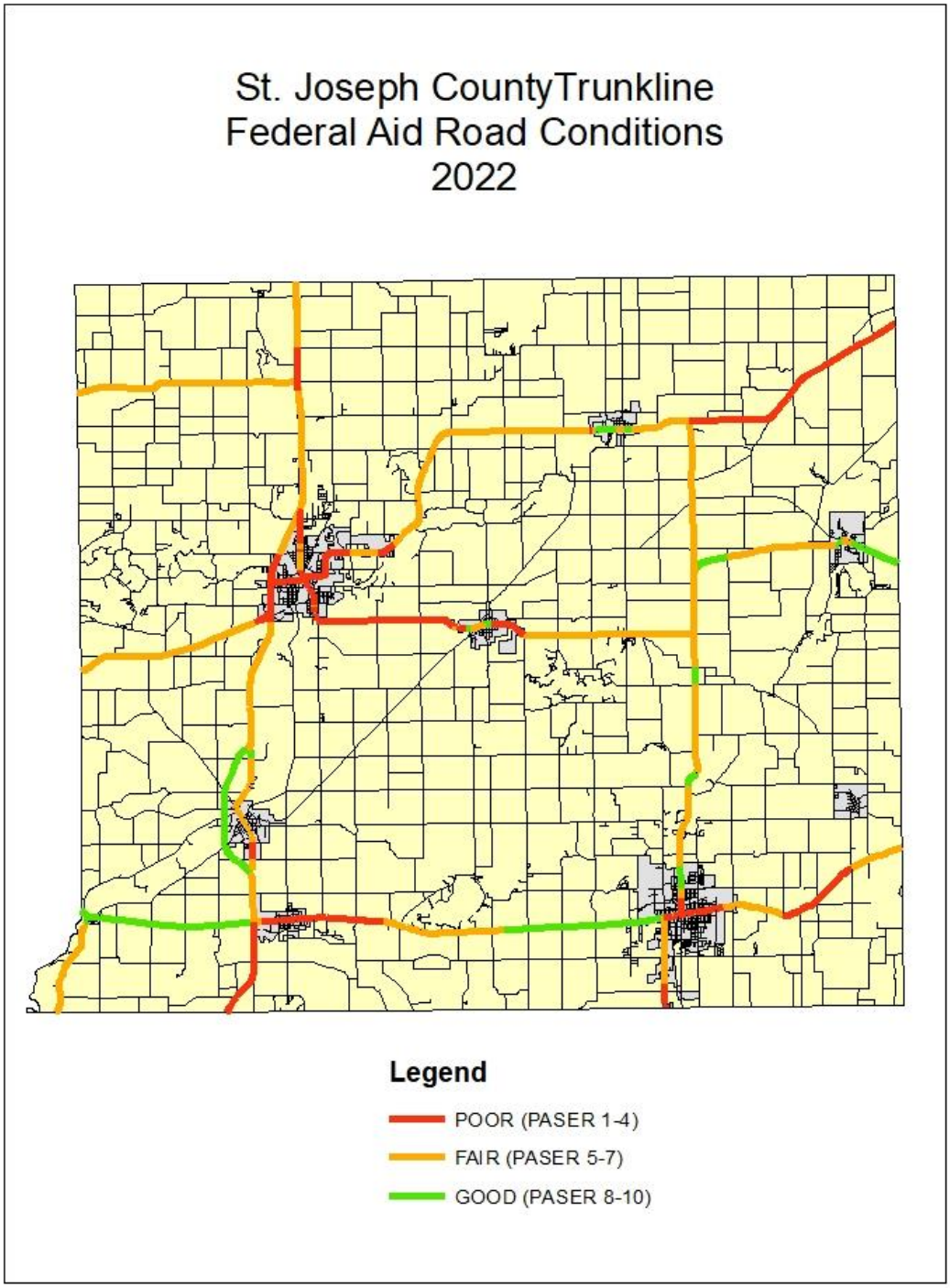


The bar graphs shown above illustrate quality of roads in St. Joseph County as recorded over the course of eleven years. It appears that road agencies in St. Joseph County had made progress in moving road miles from Poor to Fair and Good until 2016 when Poor rated road mileage began to increase while Good rated road mileage decreased. Fair rated mileage increased over that time. In the data gap between 2019 and 2021, there was a significant increase in good rated roads and a corresponding decrease in poor indicating a significant push to address the backlog of addressing poor roads. Moving forward, it will be important to administer the proper balance of capital construction and preventative maintenance treatments in order to prevent the most recent trend of roads moving from Good to Fair and Fair to Poor from continuing.

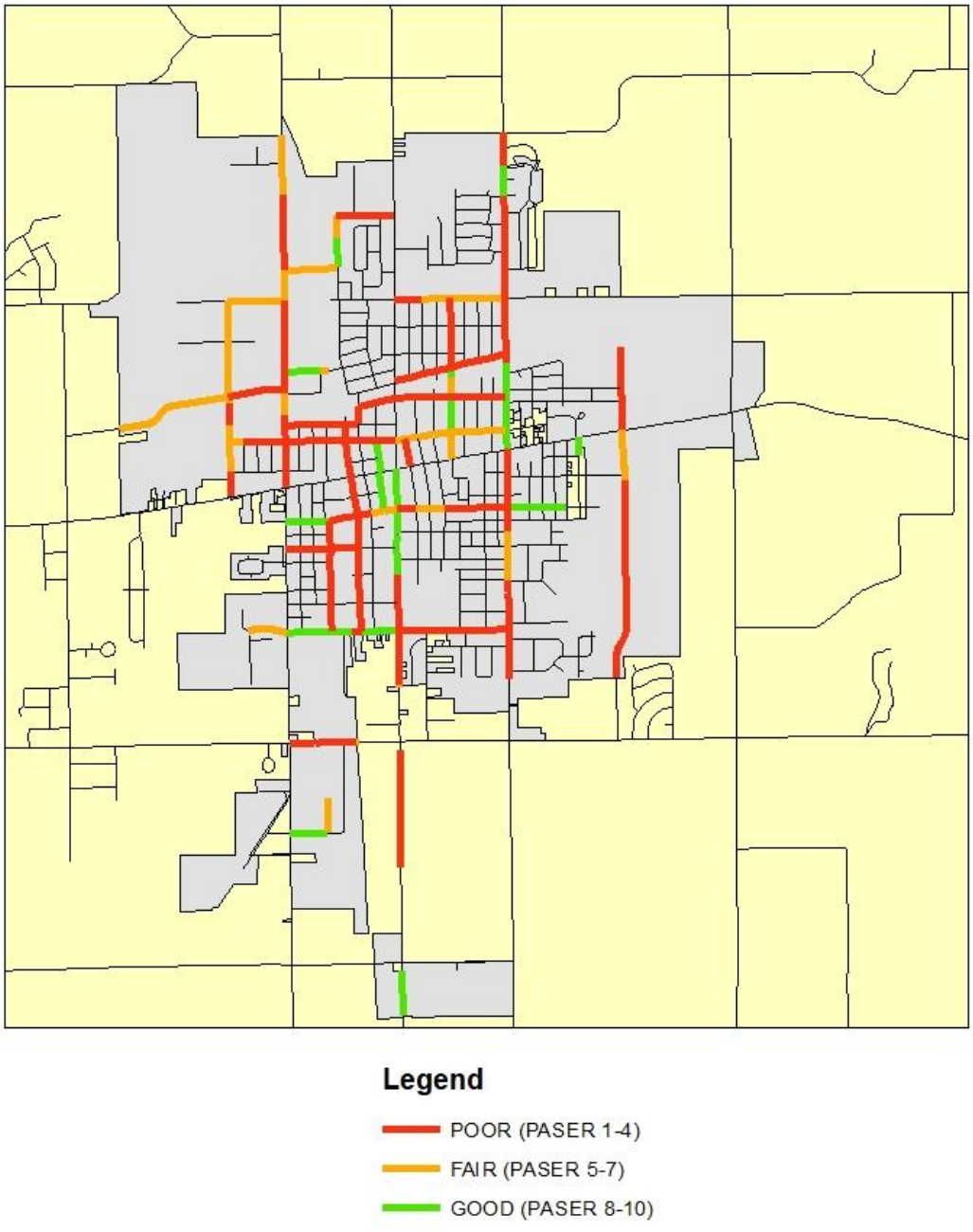
The maps on the following pages illustrate the location and condition of federal aid roads in St. Joseph County.

PASER Maps

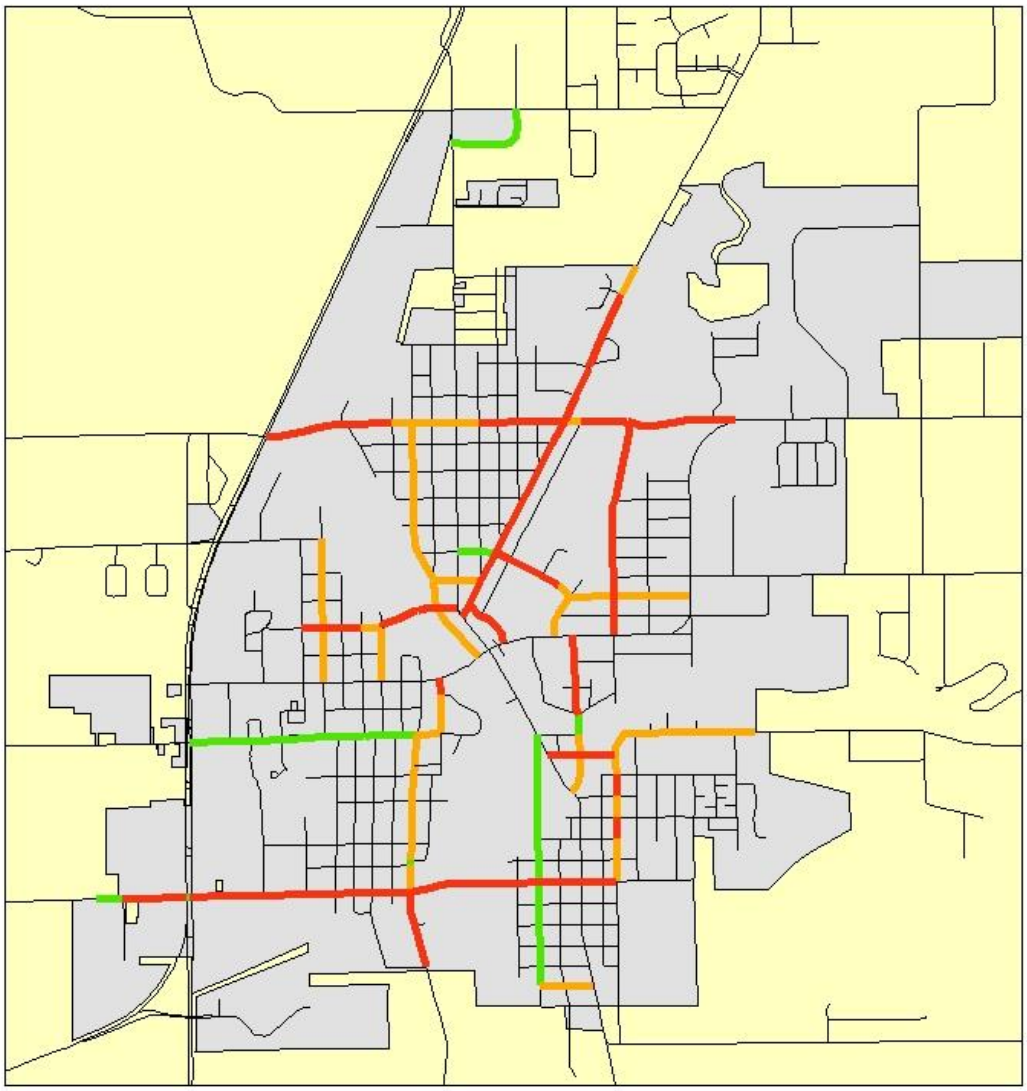

St. Joseph County Non-Trunkline
Federal Aid Road Conditions
2022
Legend
POOR (PASER 1-4)
FAIR (PASER 5-7)
GOOD (PASER 8-10)


St. Joseph CountyTrunkline
Federal Aid Road Conditions
2022
Legend
POOR (PASER 1-4)
FAIR (PASER 5-7)
GOOD (PASER 8-10)

City of Sturgis Non-Trunkline
Federal Aid Road Conditions
2022



City of Three Rivers Non-Trunkline
Federal Aid Road Conditions
2022



Legend

- POOR (PASER 1-4)
- FAIR (PASER 5-7)
- GOOD (PASER 8-10)

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 • cminger@sjcrc.com