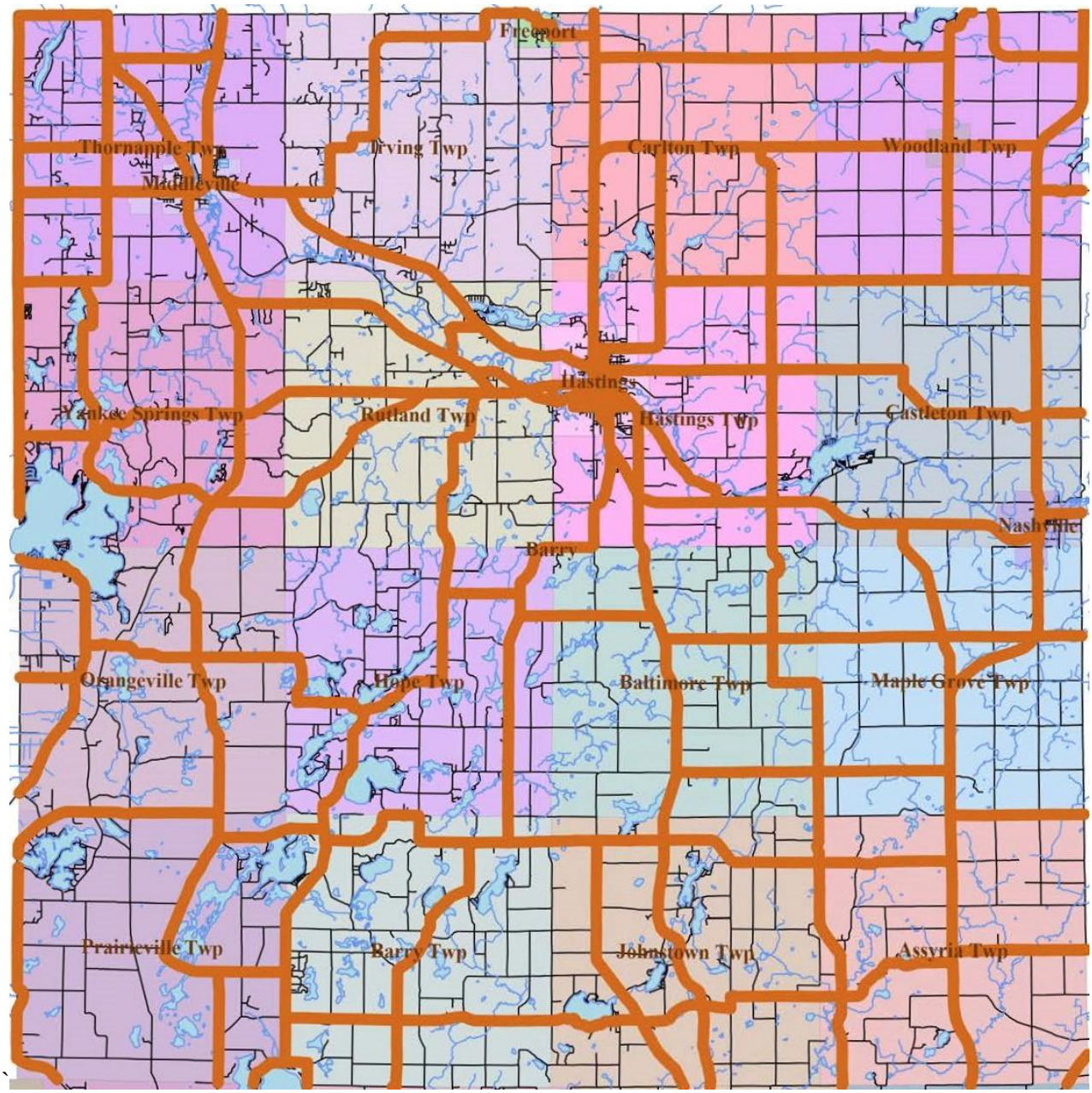



# FEDERAL AID ROAD CONDITION REPORT FOR BARRY COUNTY

2024

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

# TABLE OF CONTENTS

## Contents



## Tables



## Federal Aid Condition Maps

# ROAD CONDITION REPORT FOR BARRY COUNTY

## Executive Summary

The Kalamazoo Area Transportation Study coordinated the data collection of road inventory for Barry County in 2023. 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 Barry County, there are:

**408 centerline miles of Federal-aid roads**. This includes:

- 119 miles of state trunkline roads that are maintained by the Michigan Department of Transportation
- 268 miles of County roads maintained by the Barry County Road Commission
- 21 miles of roads maintained by the cities and villages within the county.

Traditionally, federal aid ratings have been completed over two years, roughly half of the county one year, the remainder the next. Due to restrictions imposed in response to the onset of the COVID 19 pandemic, no federal aid ratings were completed in 2020. To start bringing the schedule back in line with the historical breakdown, the entire federal aid system in Barry County was rated in 2021. In 2022 the rating effort was once again done in those areas previously done in even-numbered years, returning to the normal two-year cycle. This report takes the results of the most recent ratings for the entire county federal aid system and compares them with those from 2012 through 2024 to analyze the current status and discern any trends.

# What is Asset Management?

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.

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 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 BARRY COUNTY

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

**Table 1**

| Rating | Visible Distress | General Treatment & Conditions |
|---|---|---|
| **10** **Good** | None | New Construction less than 1 year old |
| **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' blocks). 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 | 7 to 9 | $5,500 | $1,375 |
| **Fog Seal Coat** | 0 | 8 | $4,500 | $1,125 |
| **One Course Non-Structural Overlay** | 10 | 5 to 6 | $110,000 | $11,000 |
| **Milling and One Course Non-Structural Overlay** | 10 | 4 to 5 | $130,000 | $13,000 |
| **Single Course Chip Seal** | 7 | 6 to 7 | $29,000 | $4,100 |
| **Single Chip and Fog Seal** | 9 | 5 to 6 | $33,500 | $4,700 |
| **Structural Crush & Shape** | 25 | 2 to 3 | $300,000 | $12,000 |
| **Full-Depth Reconstruction** | 30 | 1 to 2 | $500k - $1,000k | $17,000 |

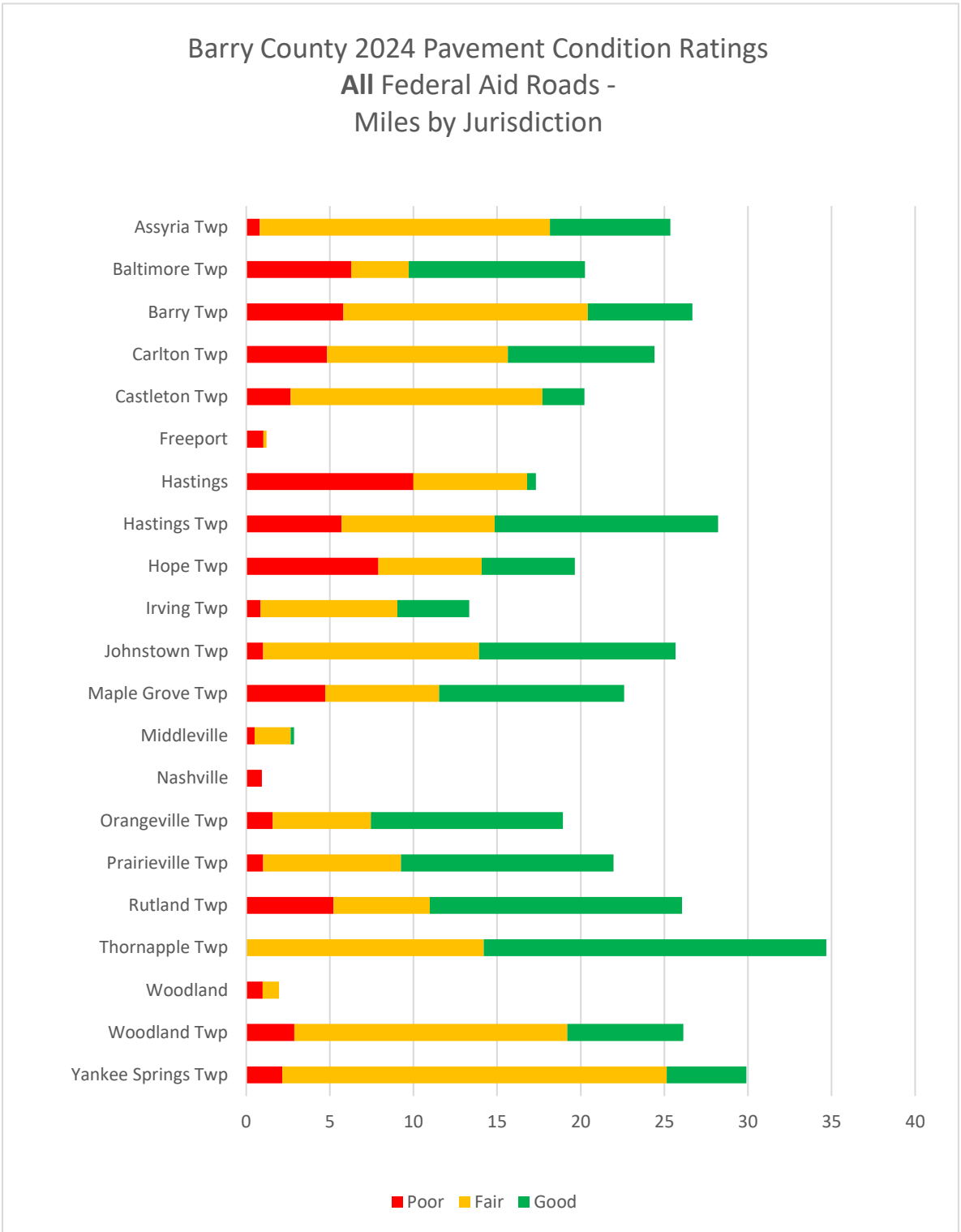
**Capital Preventative Maintenance and Reconstructive Treatments**

Table 2 details historical cost, lifespan, and appropriate existing PASER rating prior to treatment, of pavement treatment types that have been used in Barry County. These treatments range from the minimal (overband crack filling) to major construction. These costs are based on a typical two-lane roadway 22 feet in width and are current at the time of this writing. As new technologies emerge and become adopted some of the treatments may be amended or superseded. The following list provides a brief overview of each treatment:

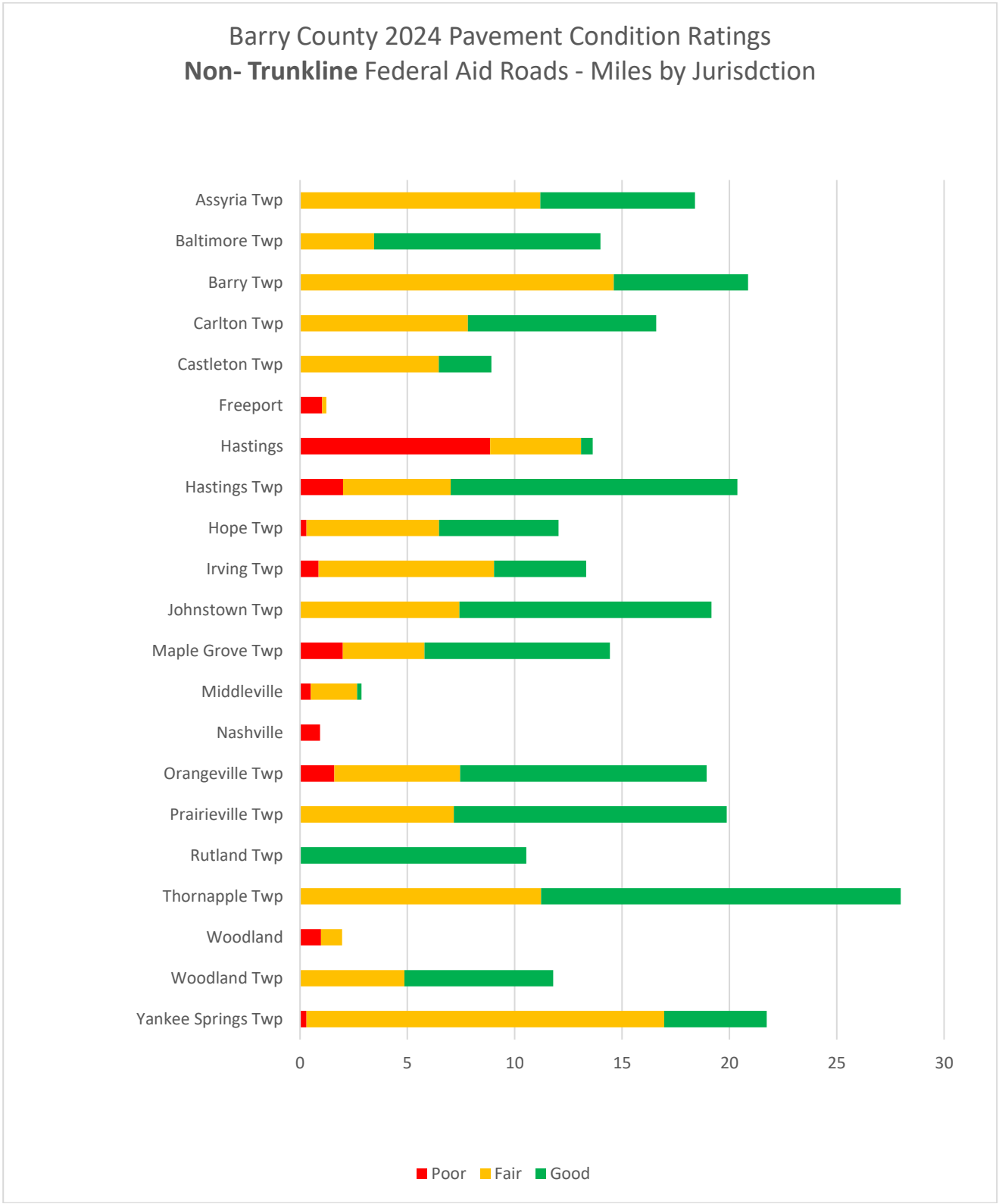
- Overband Crack Filling is used on cracks that are up to 1" wide and are moving or unmoving. The process is done by pouring hot rubber material into and over cracks to seal them from water intrusion.
- Fog Seals provide a thin asphalt coating over existing pavement. This treatment seals aggregate in 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. Fogging adds a thin layer of asphalt emulsion on top of the treated surface.
- Structural Crush and Shape recycles pavement by pulverizing existing material (including base and sub-base) and blending it with a new binding agent. The new mix is then used to repave the same road and is sometimes topped with a new surface layer of asphalt.
- Full-Depth Reconstruction is the replacement of the entire roadway structure, including the base and subbase, with new material. It is used only when there is no salvage value to any of the existing components.

# ROAD CONDITION REPORT FOR BARRY COUNTY

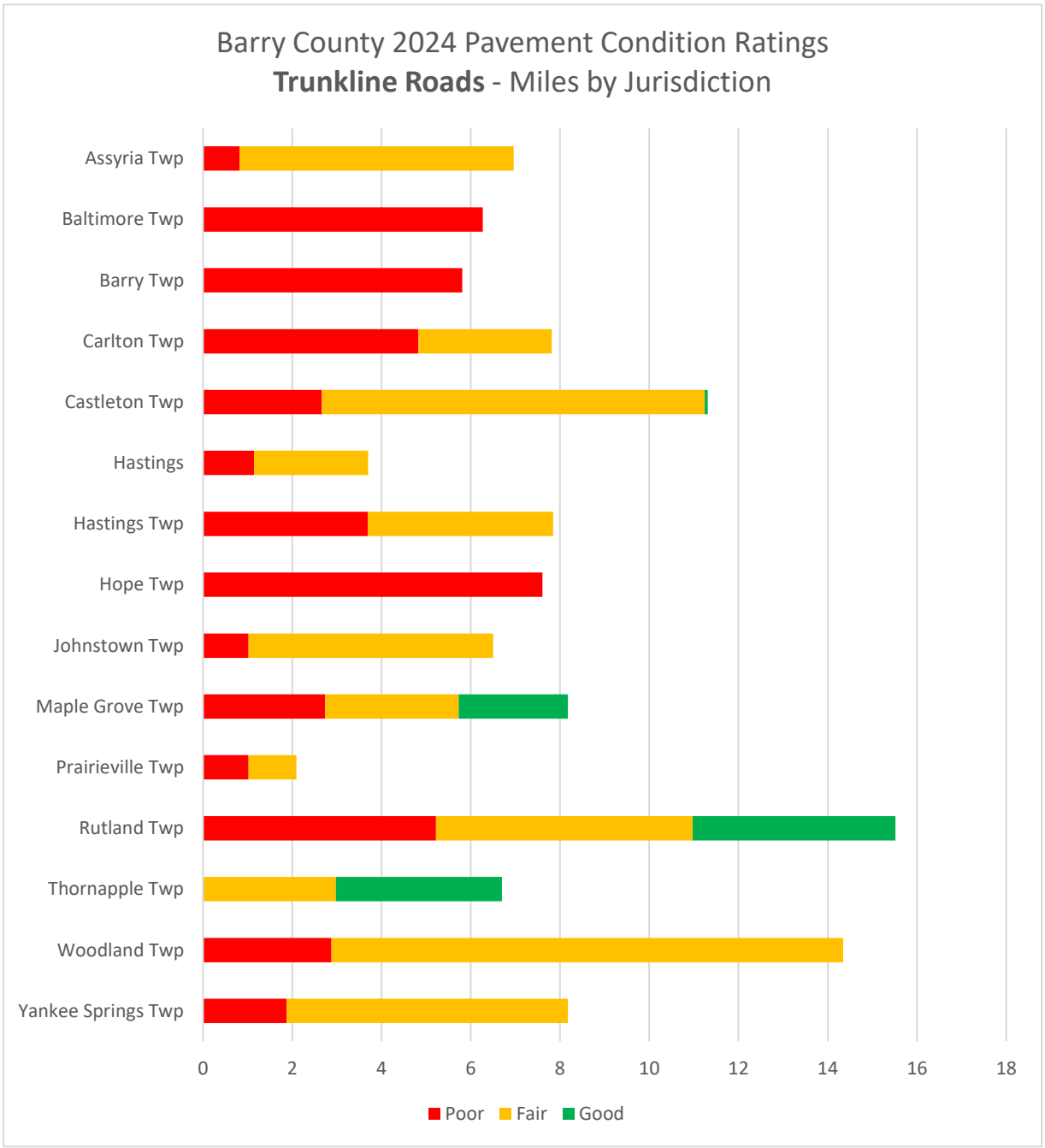
## 2024 Ratings Summaries



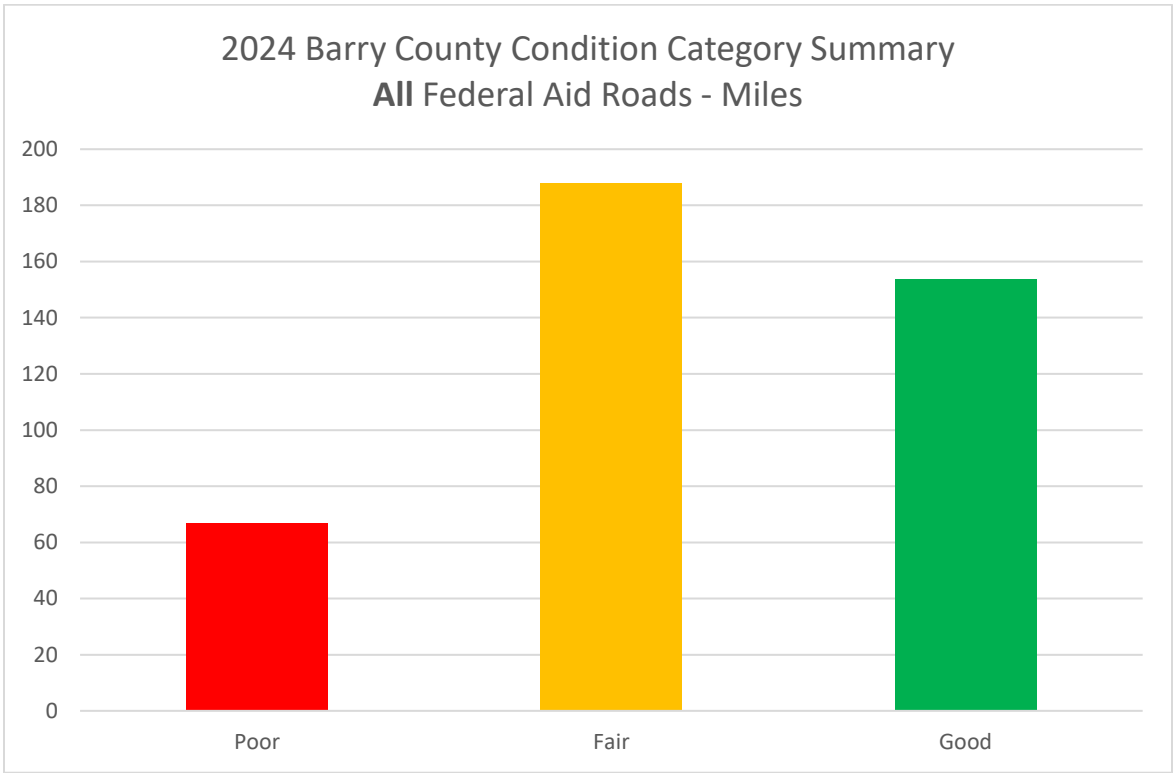
# ROAD CONDITION REPORT FOR BARRY COUNTY

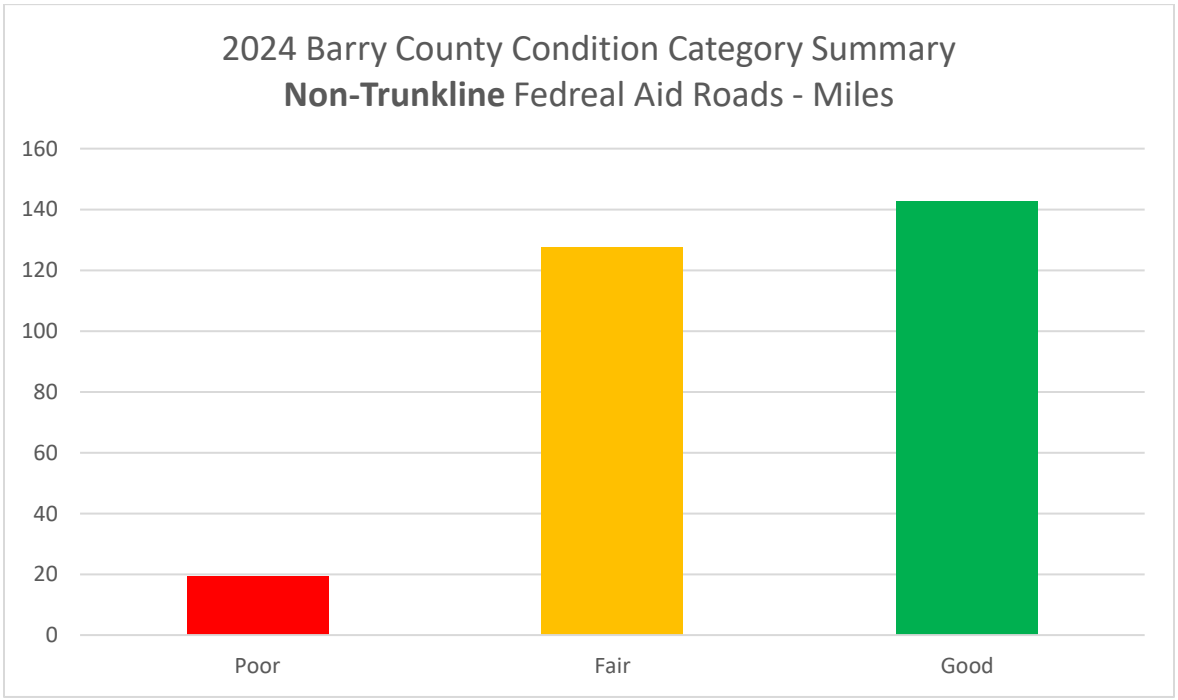


# ROAD CONDITION REPORT FOR BARRY COUNTY

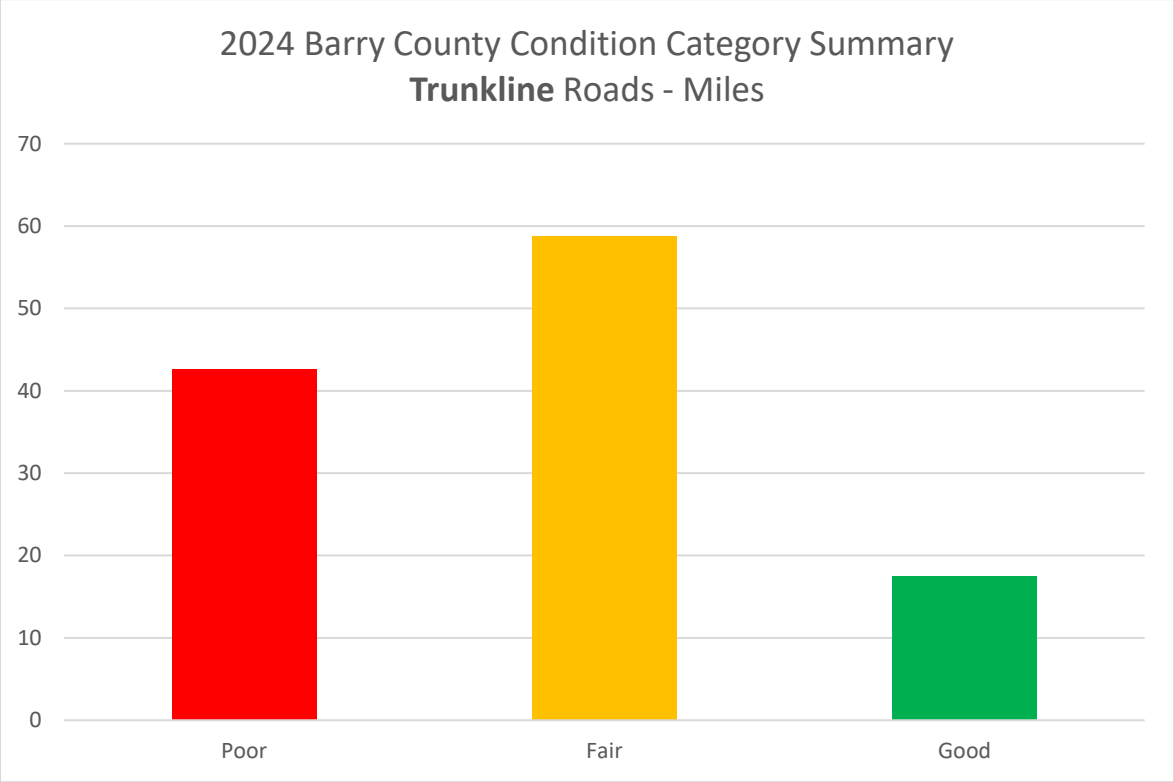


# ROAD CONDITION REPORT FOR BARRY COUNTY

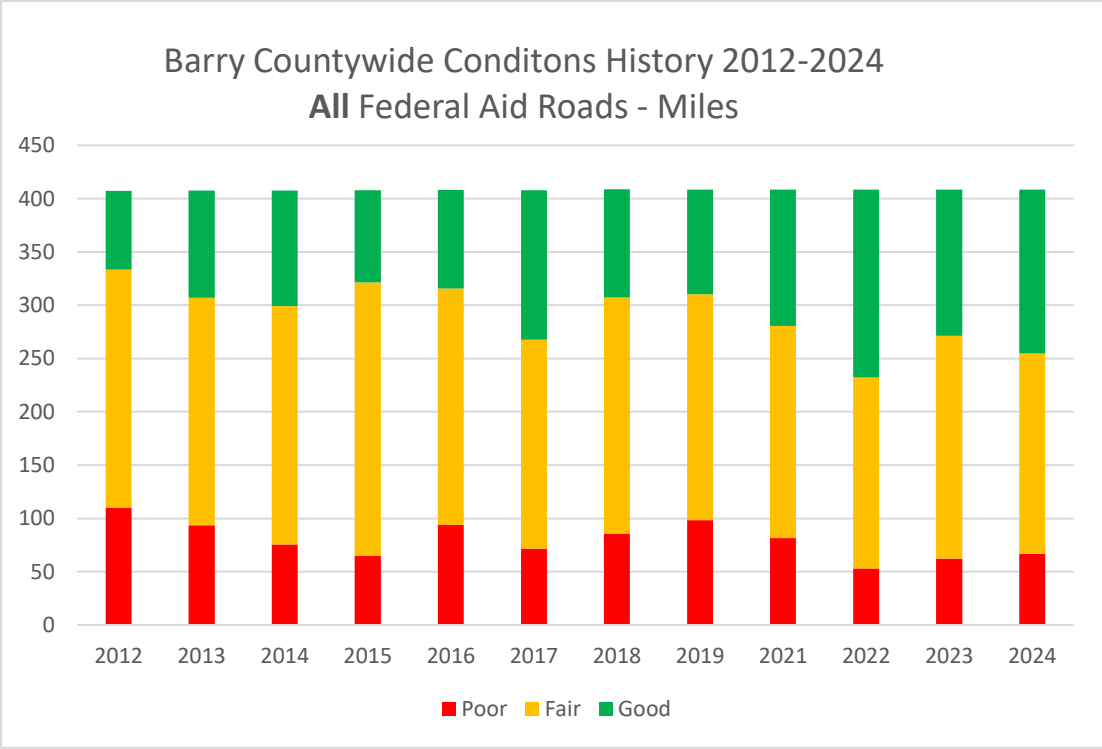


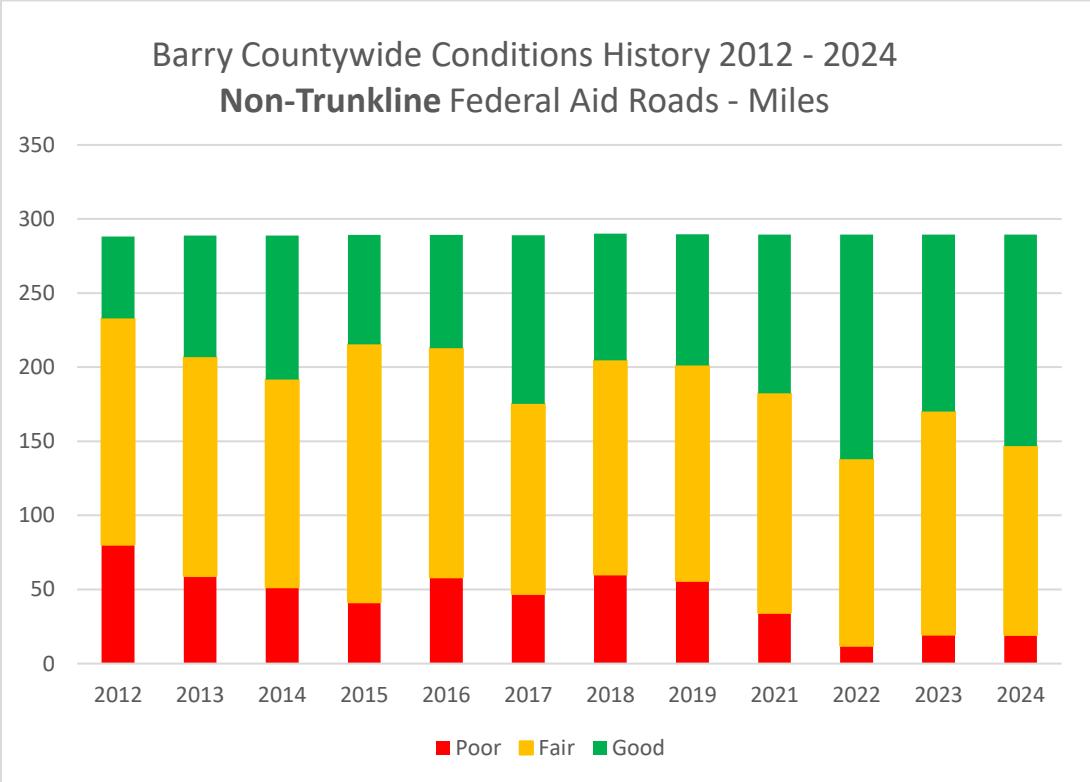



# ROAD CONDITION REPORT FOR BARRY COUNTY

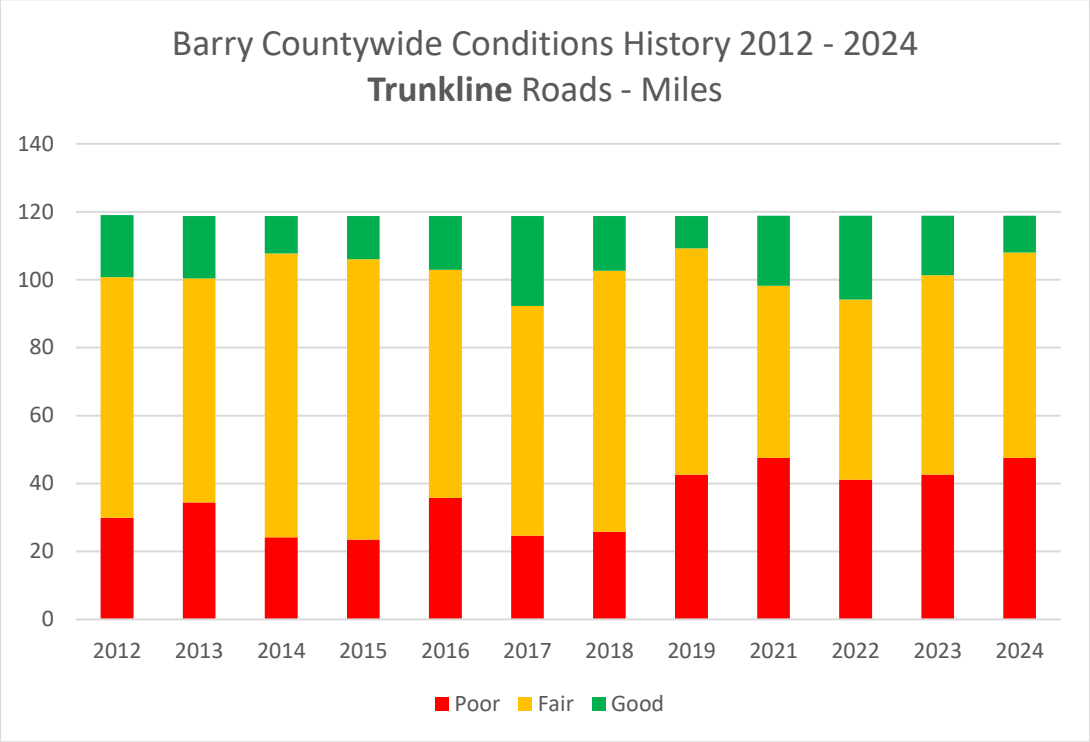


# Federal Aid Conditions History and Trends



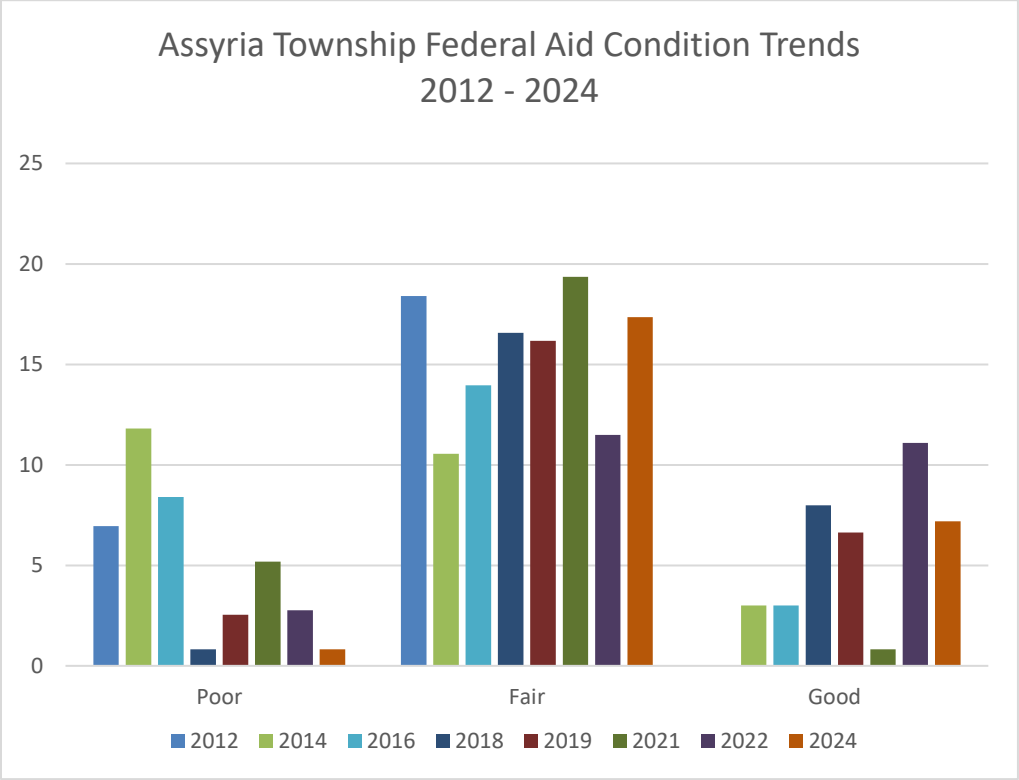
# ROAD CONDITION REPORT FOR BARRY COUNTY

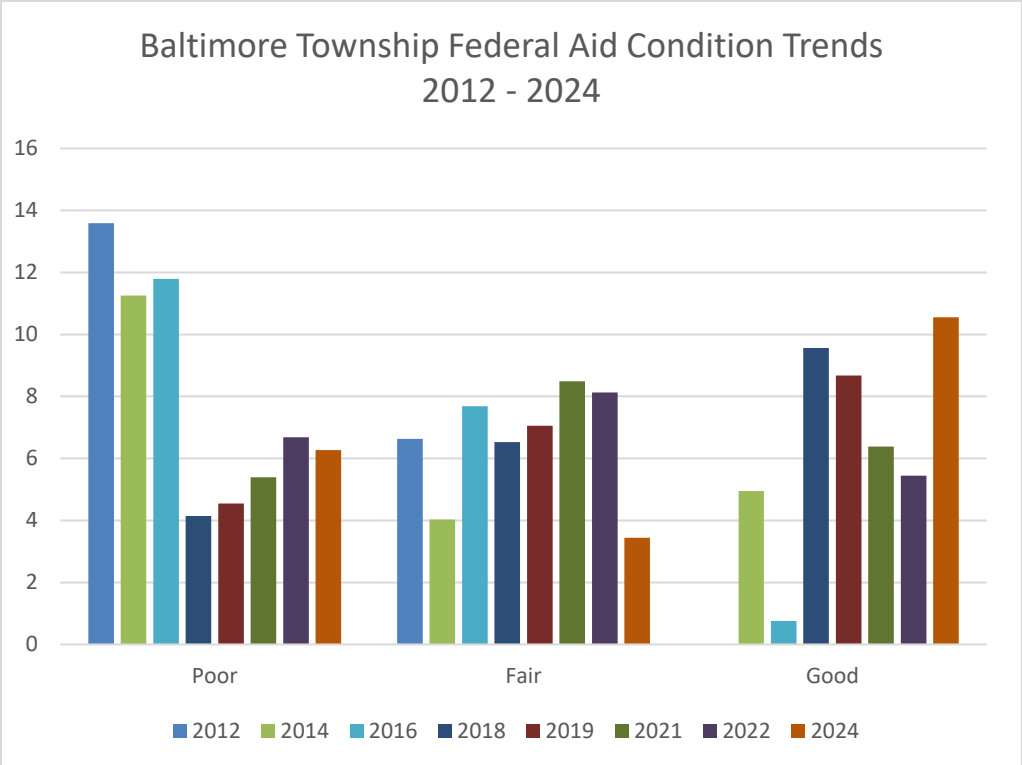



The charts above reflect the progression of the PASER rating conditions of Barry County's federal-aid roads as recorded biennially since 2012. Starting in 2017, there was a slight but steady increase in road miles rated poor that ended in 2021. When looked at by jurisdiction, it is apparent that this trend was due to a significant rise in Poor rated State Trunkline roads, peaked in 2021. Local Agency non-trunkline roads declined in Poor rated mileage from 2018 to 2022 but there has been a slight increase in 2023 and 2024. The mileage of non-trunkline roads rated Good continues a cyclic trend of increase for several years followed by a marked decrease to begin another run increasing. Each new cycle has more miles of Good rated roads than the previous one. The mileage of Fair rated roads has held relatively steady since the 2015 – 2016 period, though there appears to have been an increase from 2022 to 2023. Despite the smaller cycles within the ranges, the overall trend still appears to be toward a decrease in Poor and increase in Good rated road mileages, with each sub-cycle starting at a slightly better point than the previous one. Trunkline roads have been trending toward more poor rated miles and fewer good rated miles since 2021.

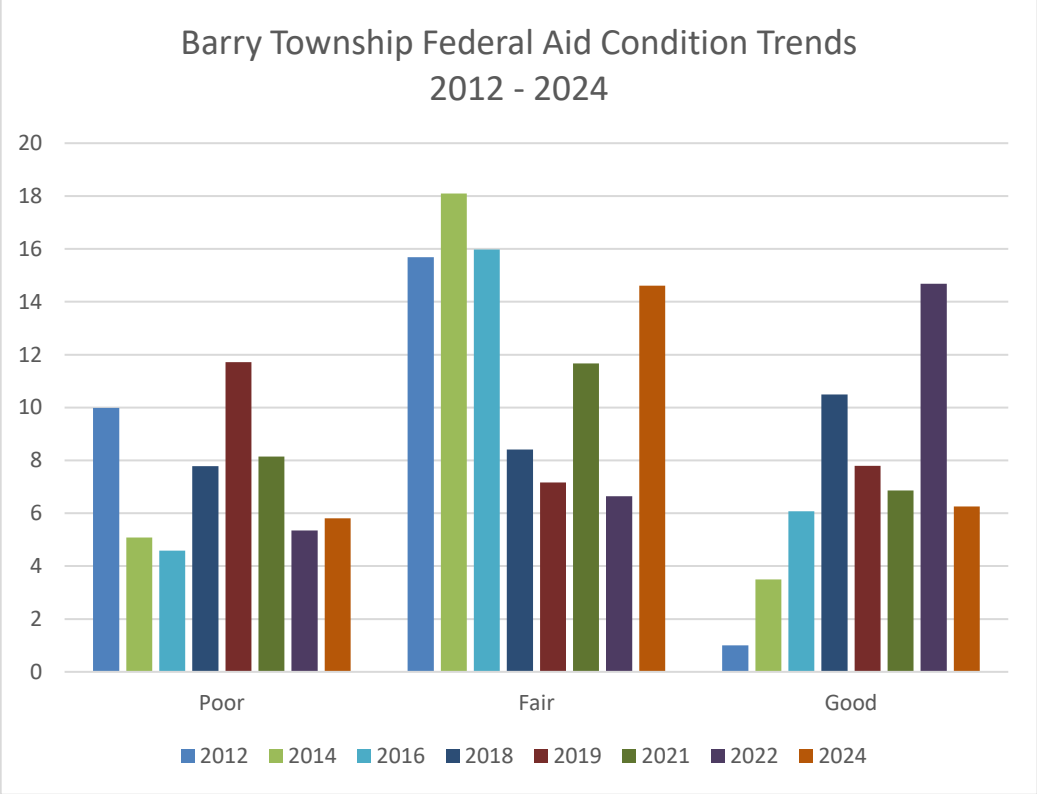
When looking at township breakdowns from 2024 on the following pages, it can be seen that in most jurisdictions the largest share of Federal Aid roads are rated Fair or Good, with Poor generally the lowest quantity. This is a change from the recent past when "Good" rated roads were consistently the smallest component of Federal Aid miles in Barry County.

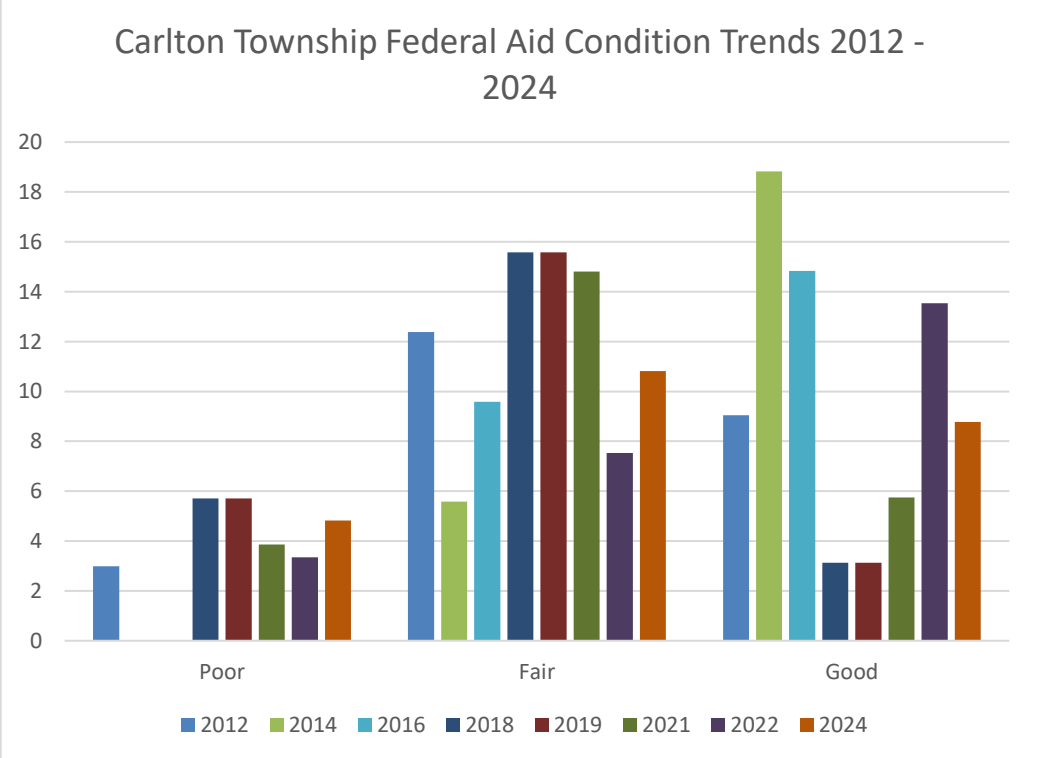
## 2012-2024 Federal Aid Road Condition Trends



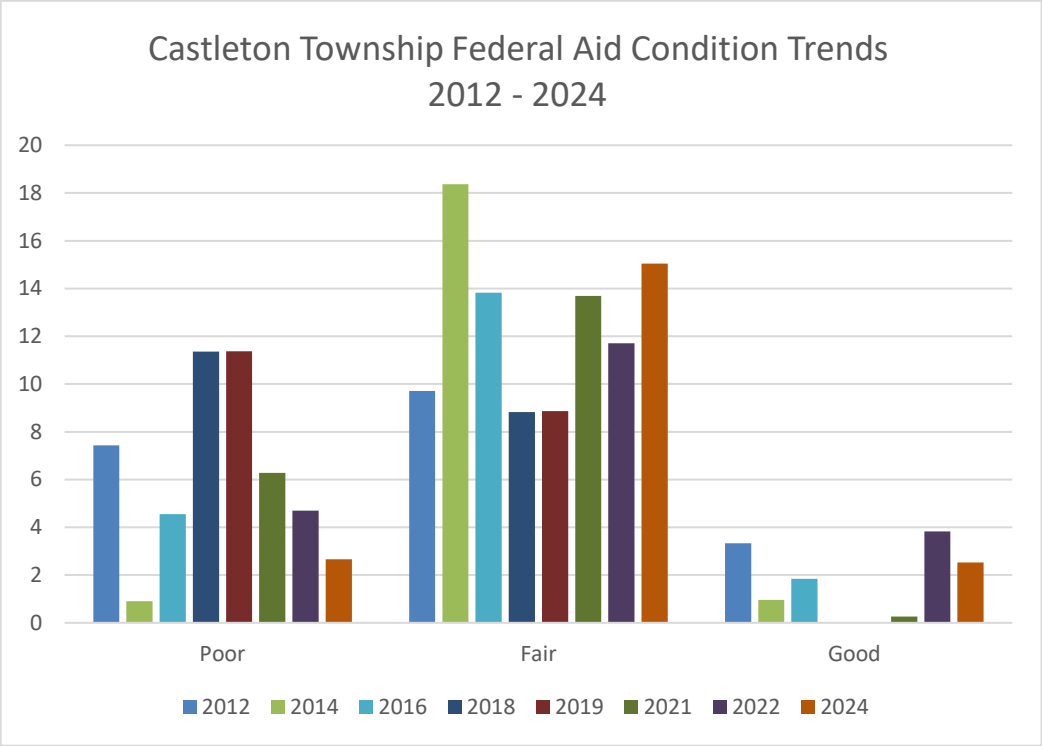



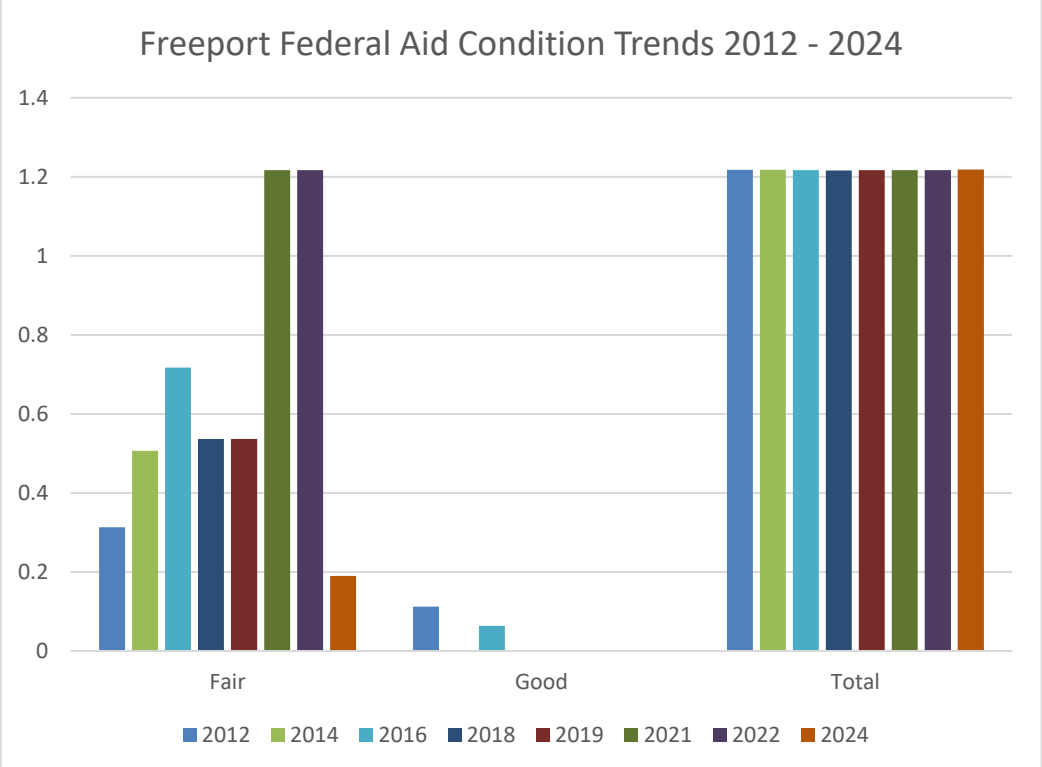
## 2012-2024 Federal Aid Road Condition Trends



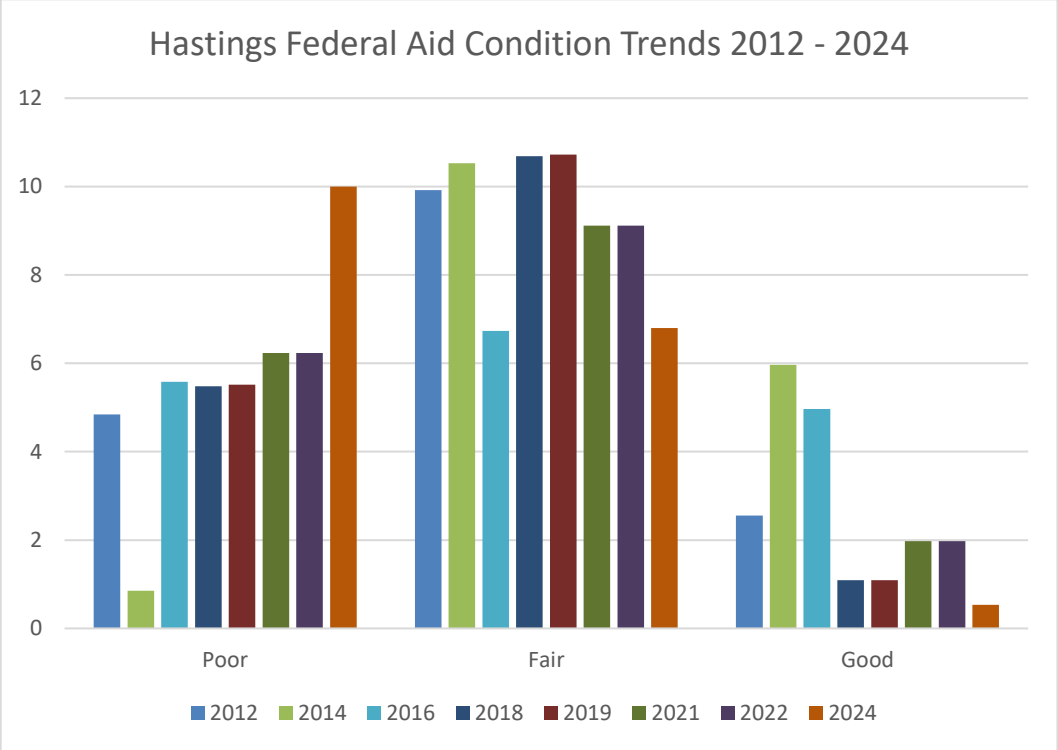



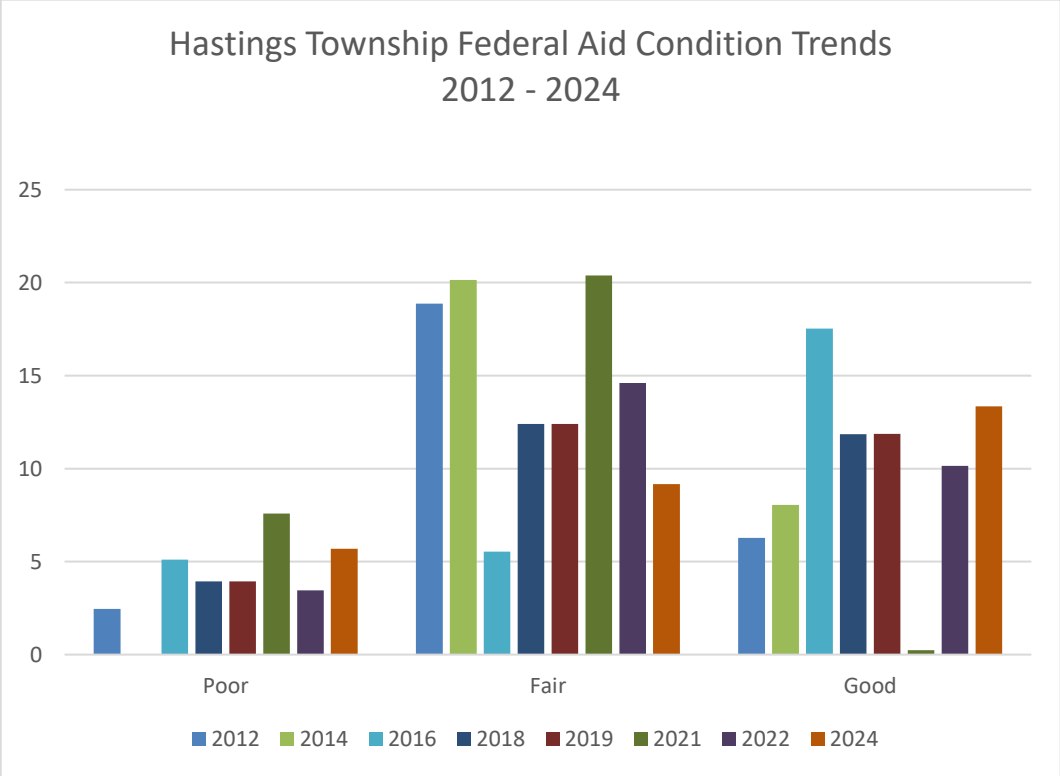
## 2012-2024 Federal Aid Road Condition Trends



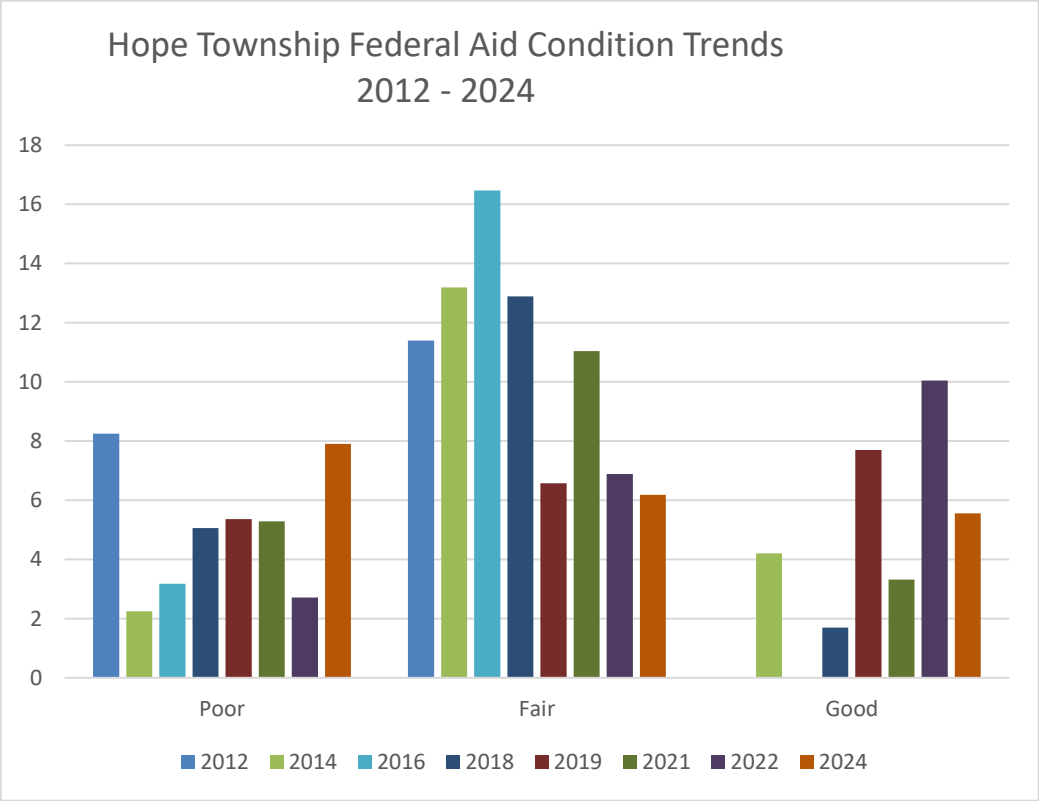



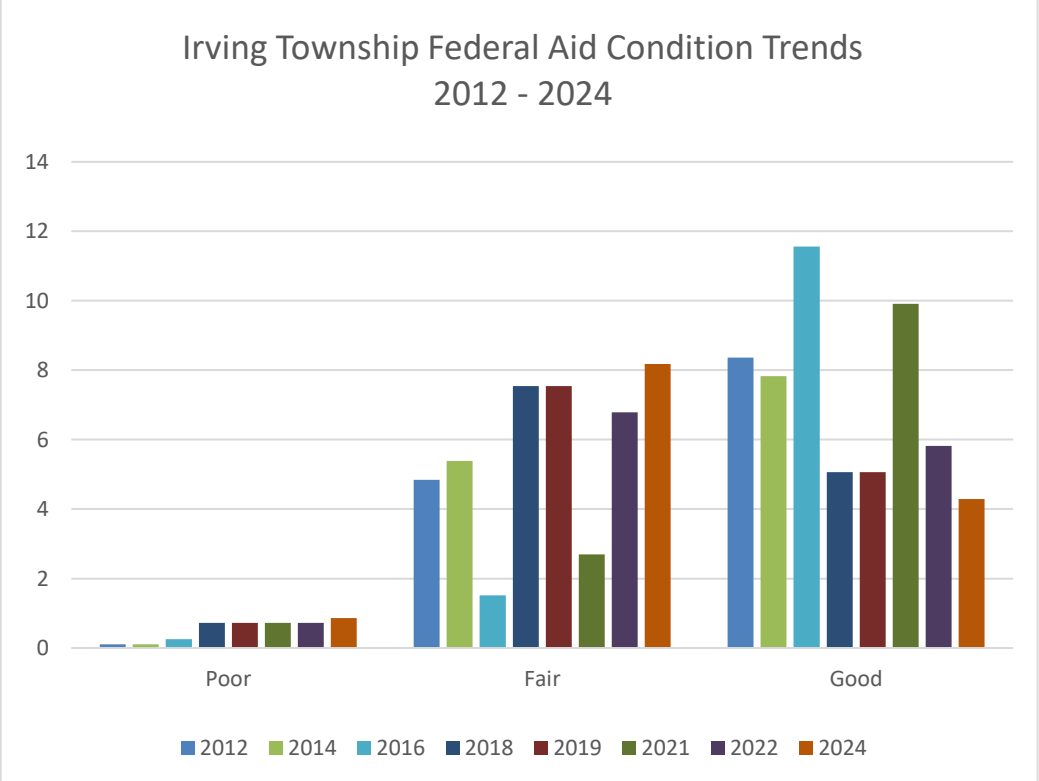
## 2012-2024 Federal Aid Road Condition Trends



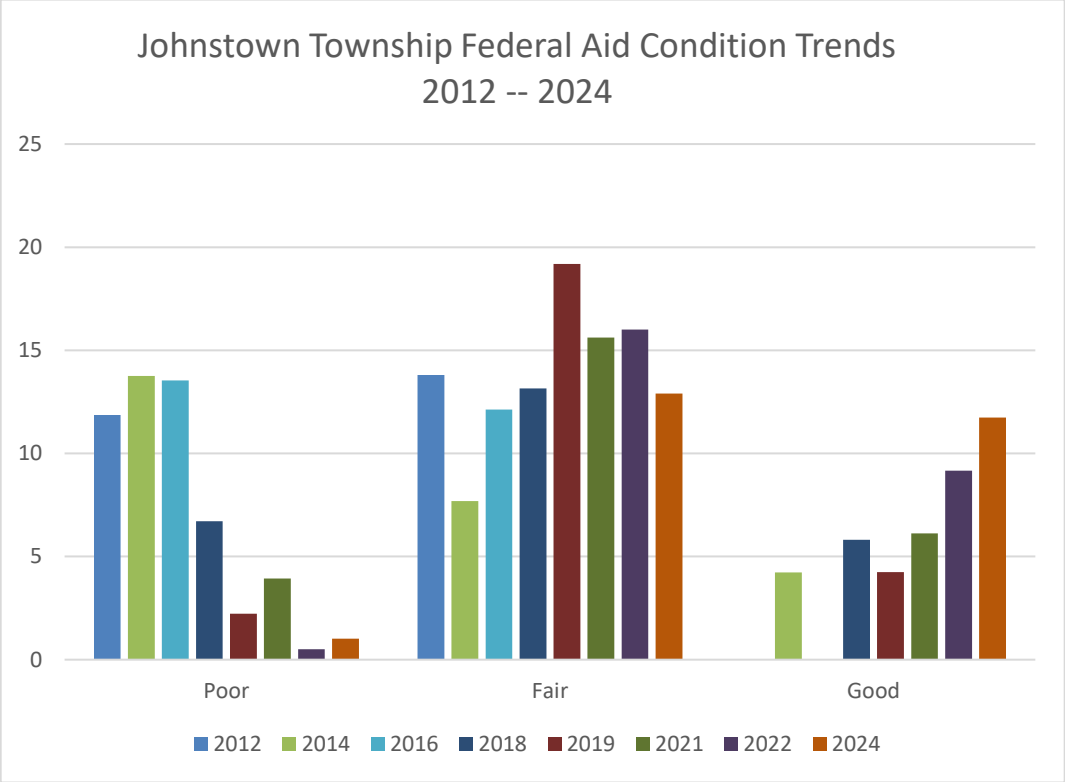



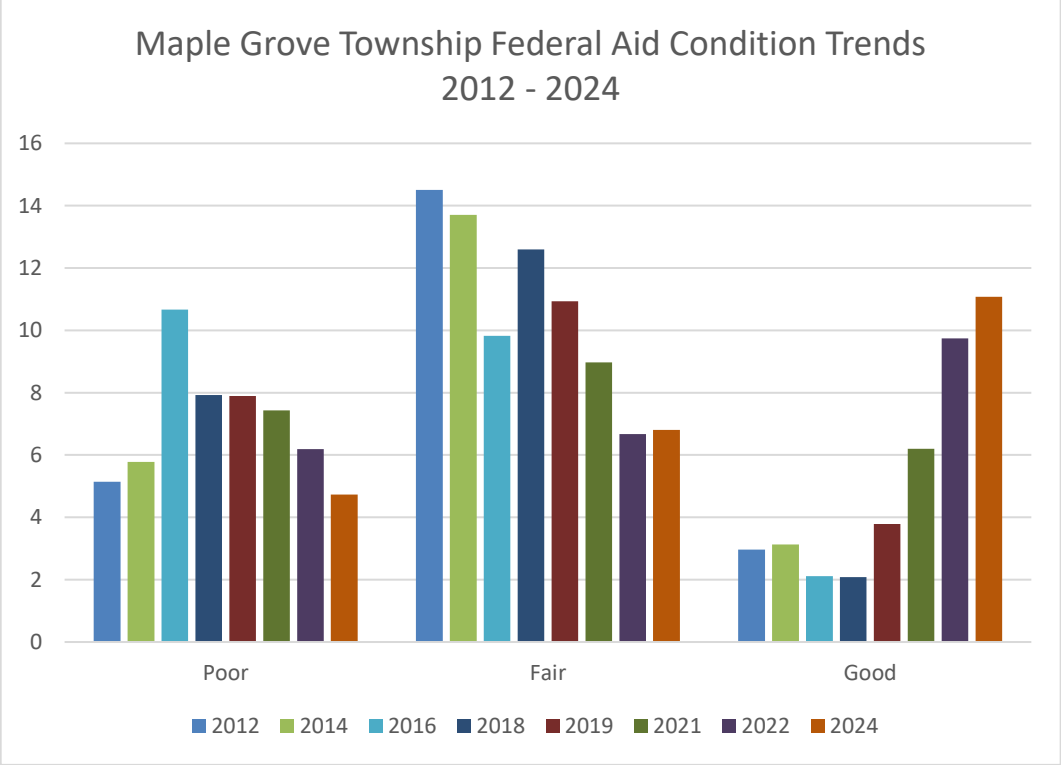
## 2012-20124 Federal Aid Road Condition Trends



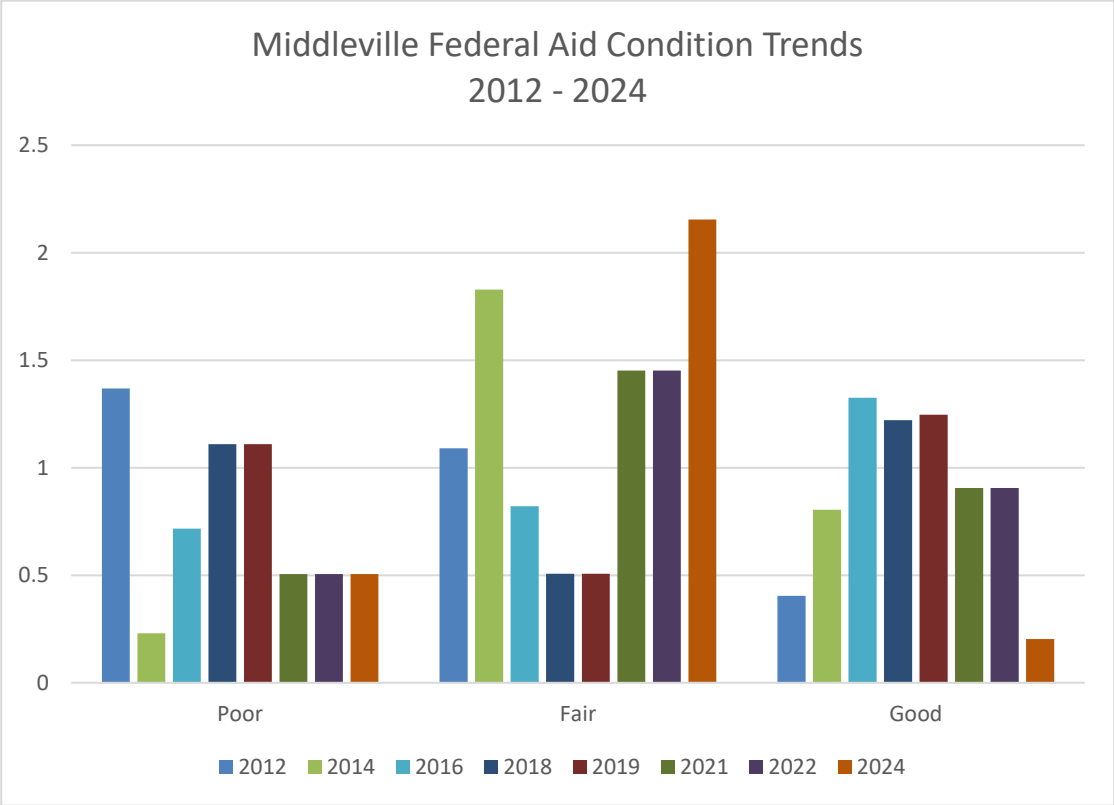



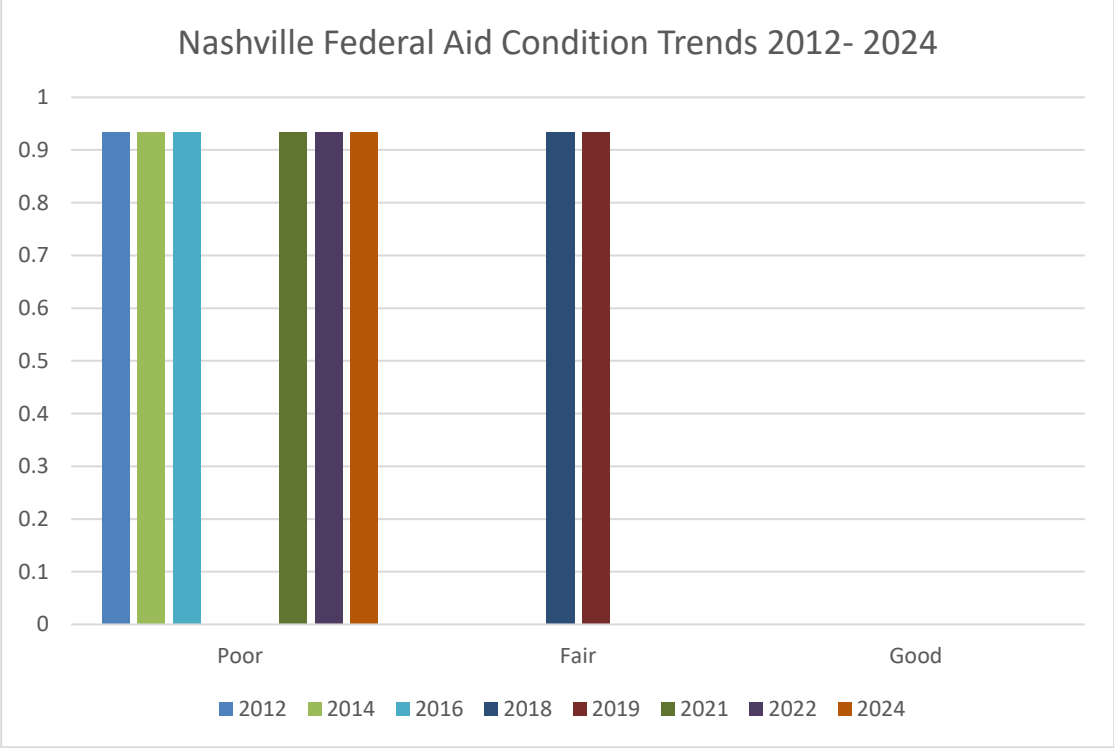
## 2012-2024 Federal Aid Road Condition Trends



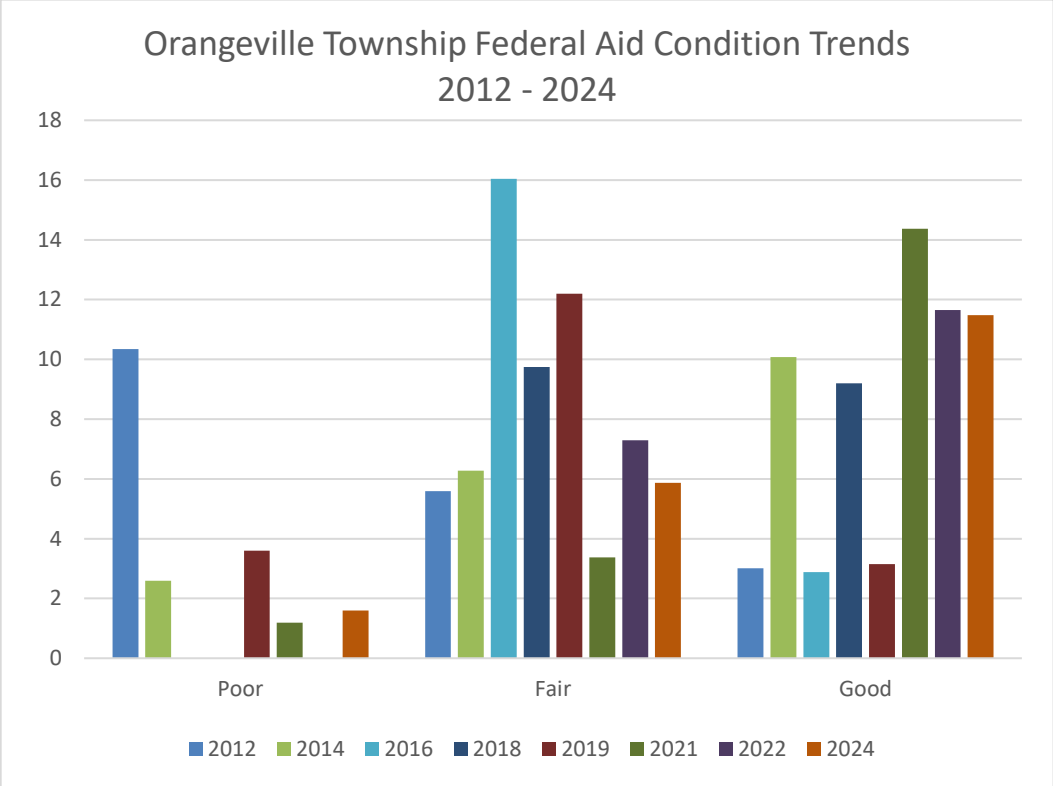



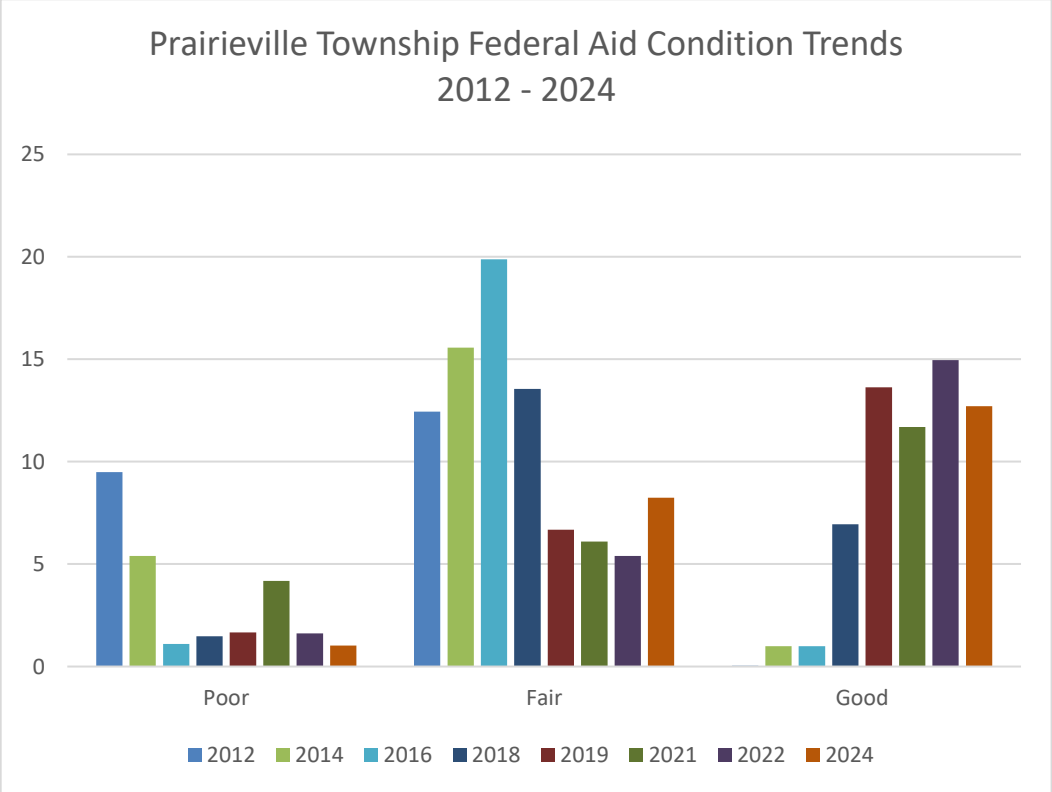
## 2012-2024 Federal Aid Road Condition Trends



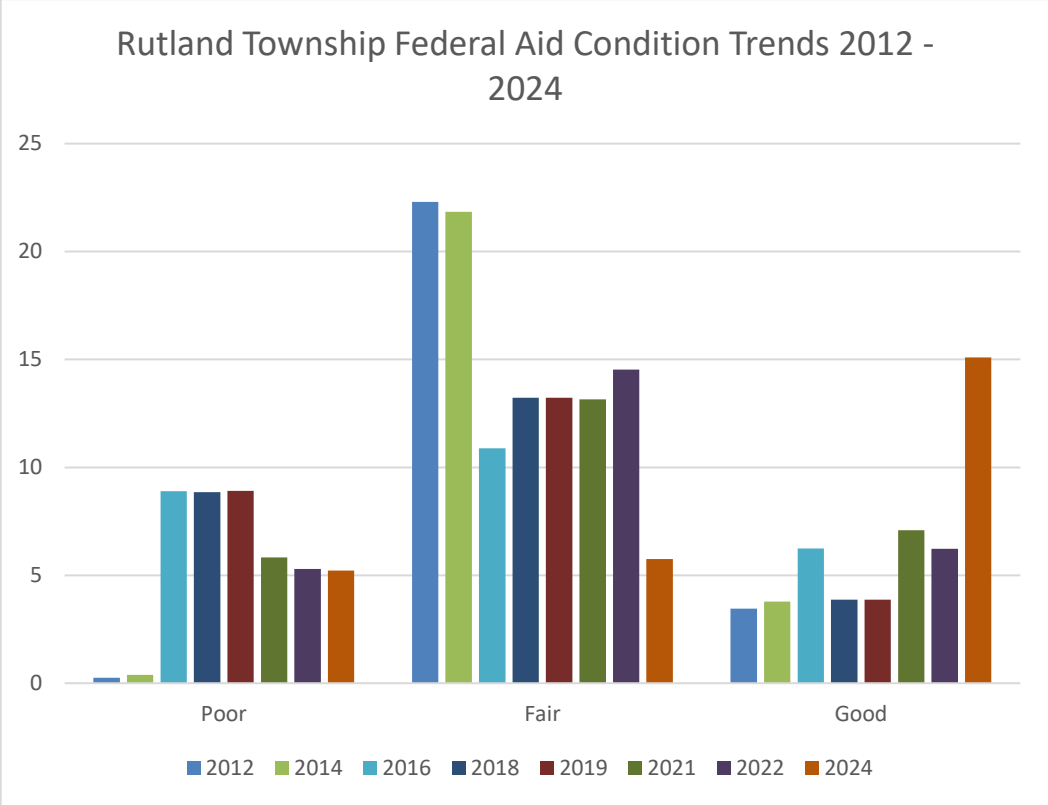



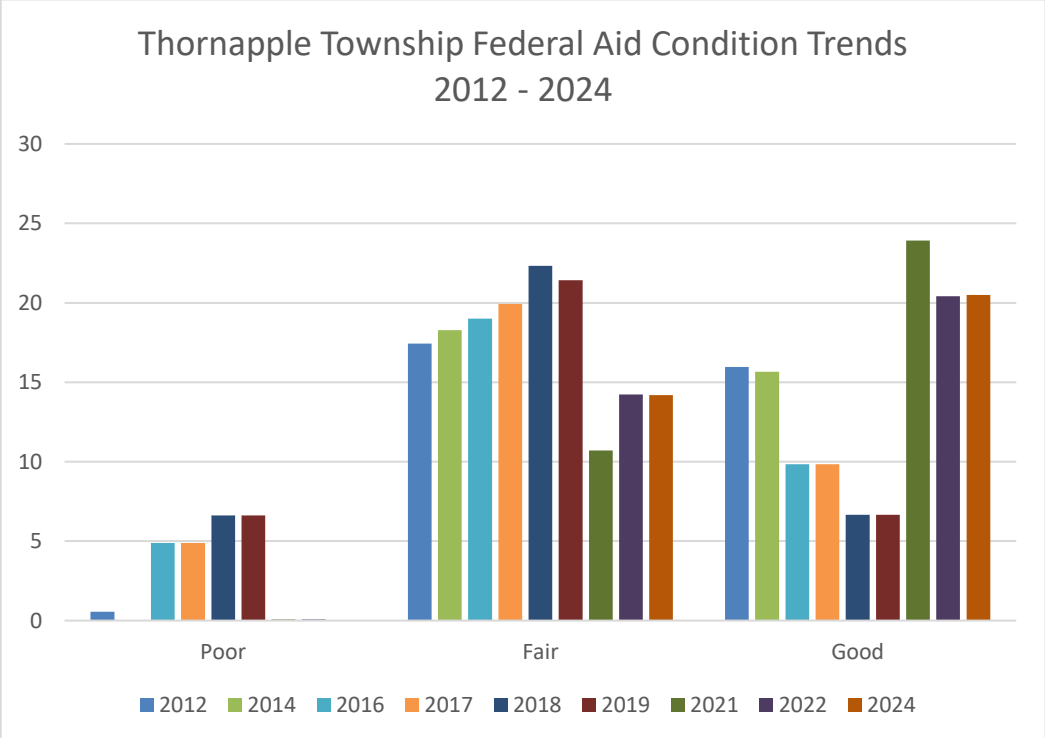
## 2012-2024 Federal Aid Road Condition Trends



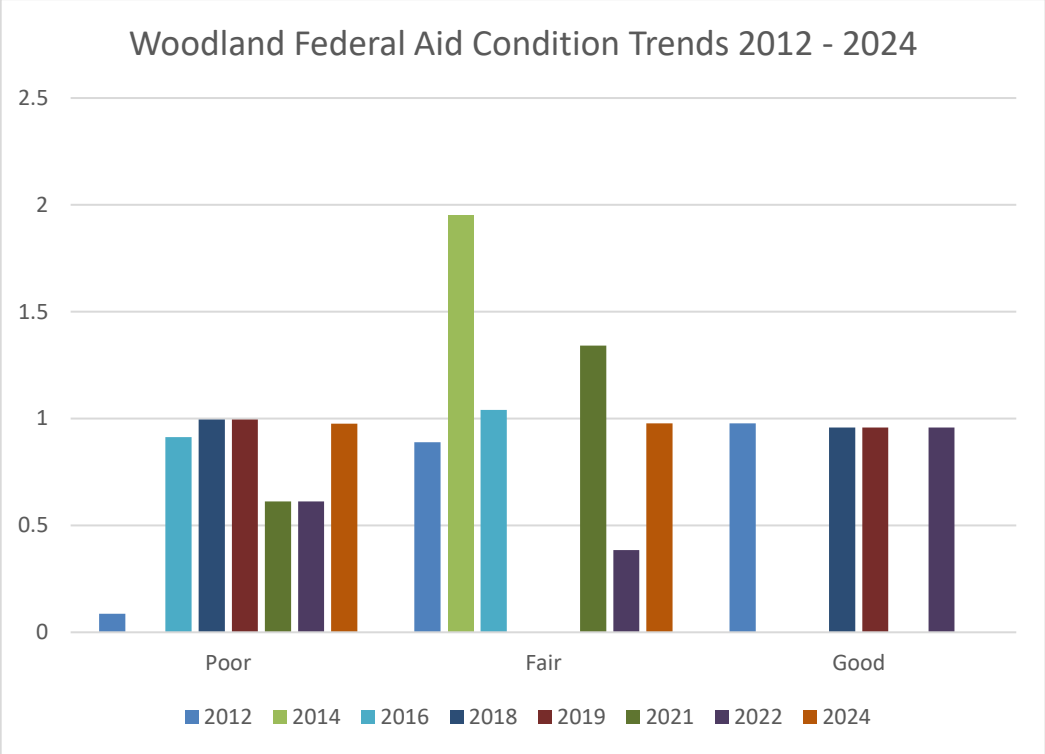



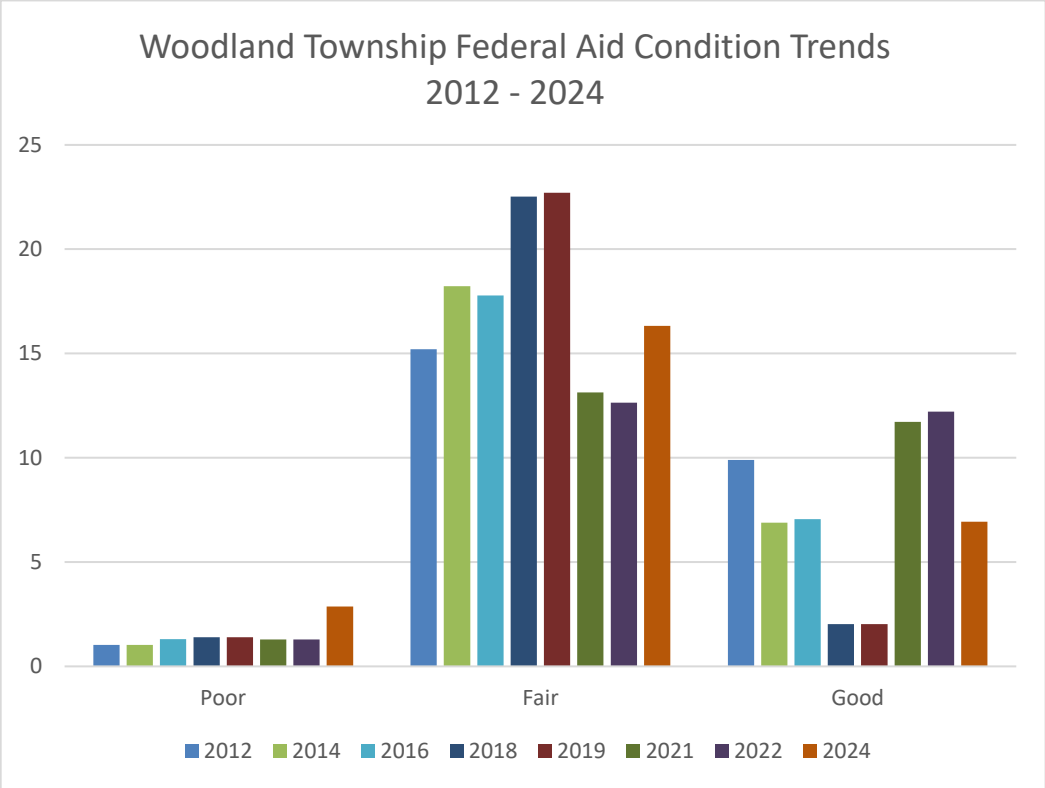
## 2012-2024 Federal Aid Road Condition Trends



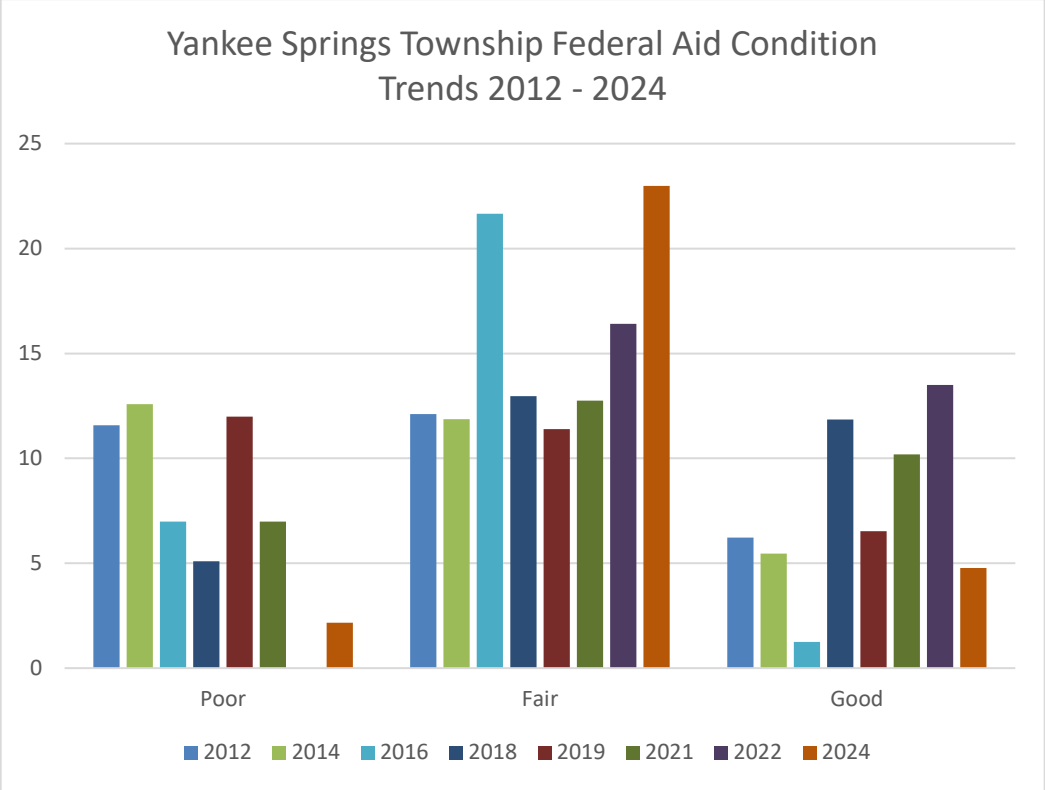



## 2012-2024 Federal Aid Road Condition Trends



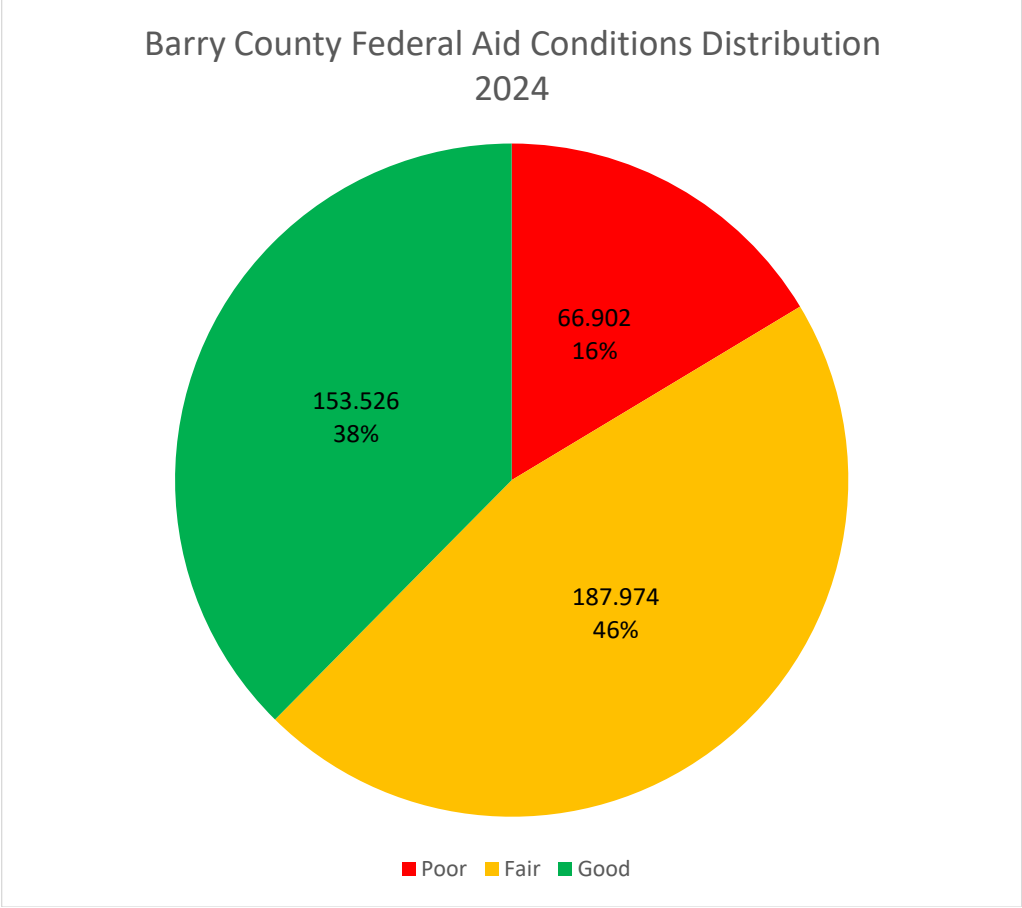



## 2012-2024 Federal Aid Road Condition Trends

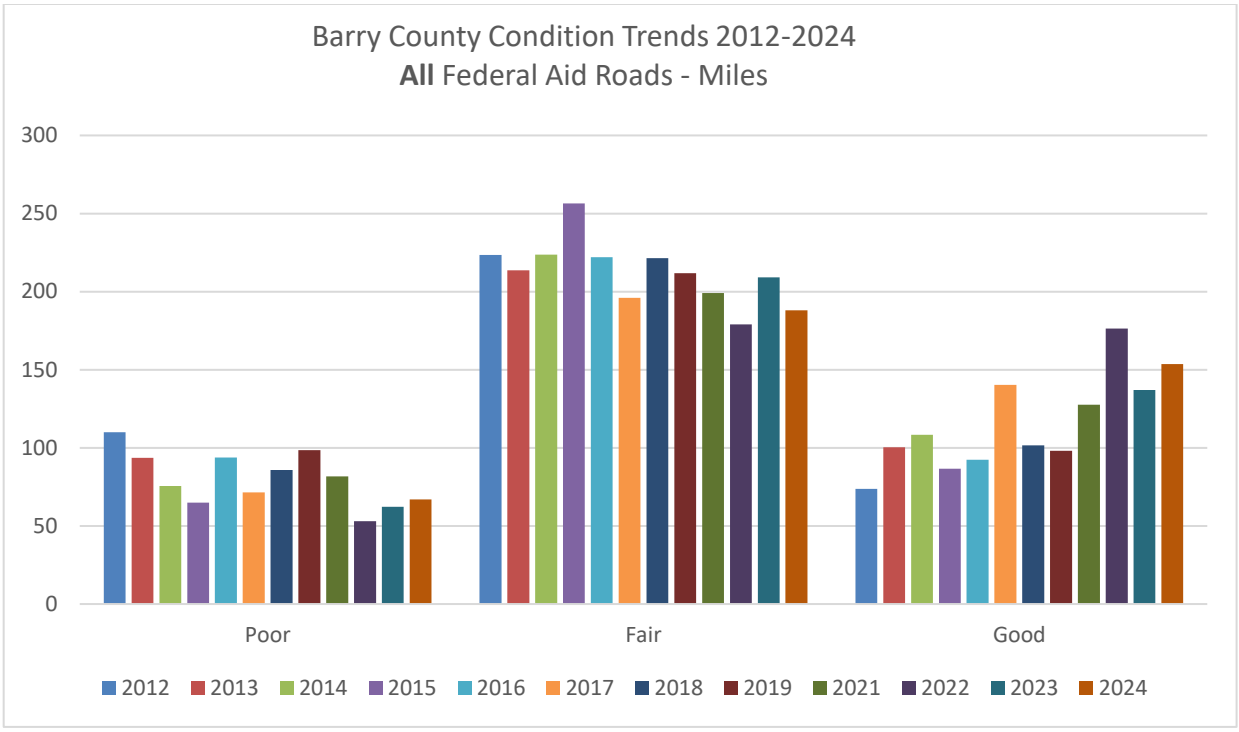


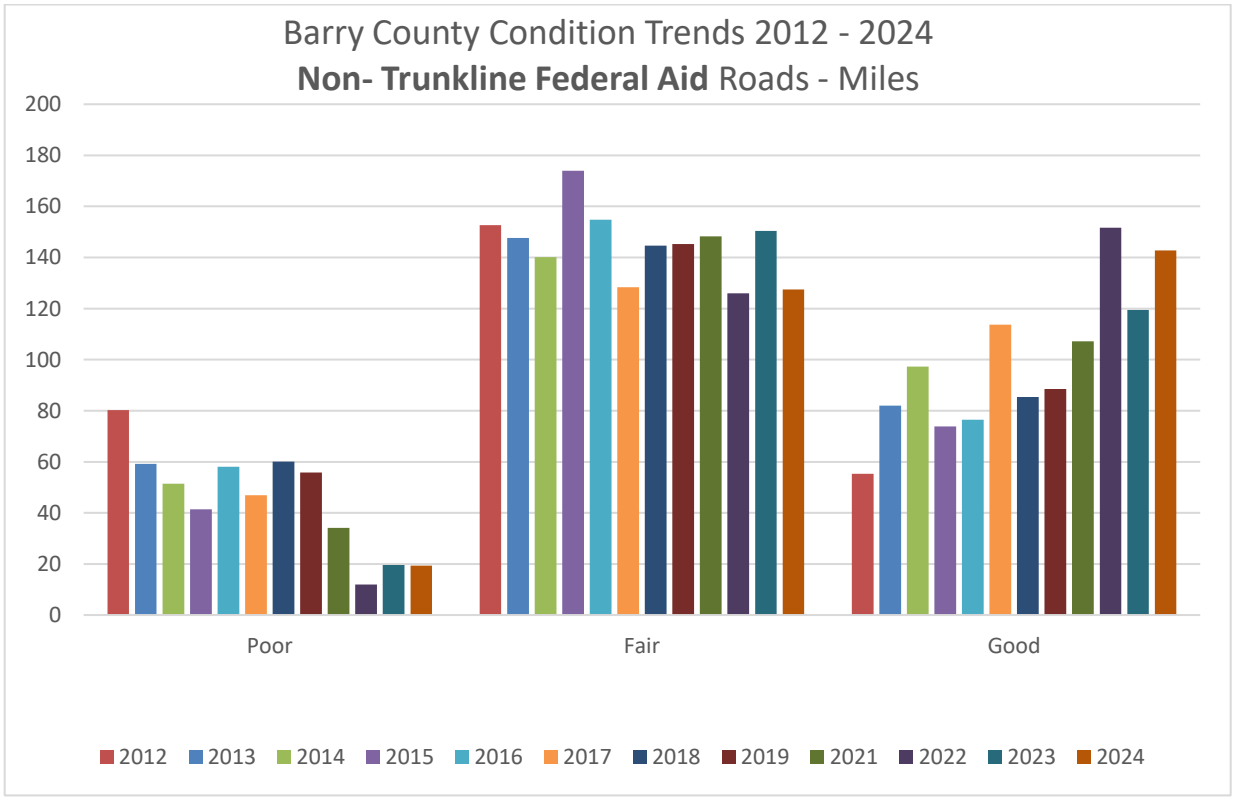
## Pavement Condition Summary

Of the 408 miles of federal-aid roads that were rated in 2024, approximately 67 miles are rated as being in Poor condition, 188 miles rated Fair, and 153 miles Good. This distribution means that currently 84% are in Fair or Good condition. The chart below illustrates the actual mileage/ percentage distribution. When looking at the historical trends in previous charts, it appears that 2023 was the start of another cycle of an initial decline in Good rated roads followed by several years of increase . If the historical cycling continues in its current fashion, the overall trend toward a general improvement in road conditions should continue, though the rate of improvement will slow, as the room for improvement shrinks with each cycle. Through continued proper asset management strategies, the amount of poor road miles and the maintenance costs associated with structural improvements can be further diminished.

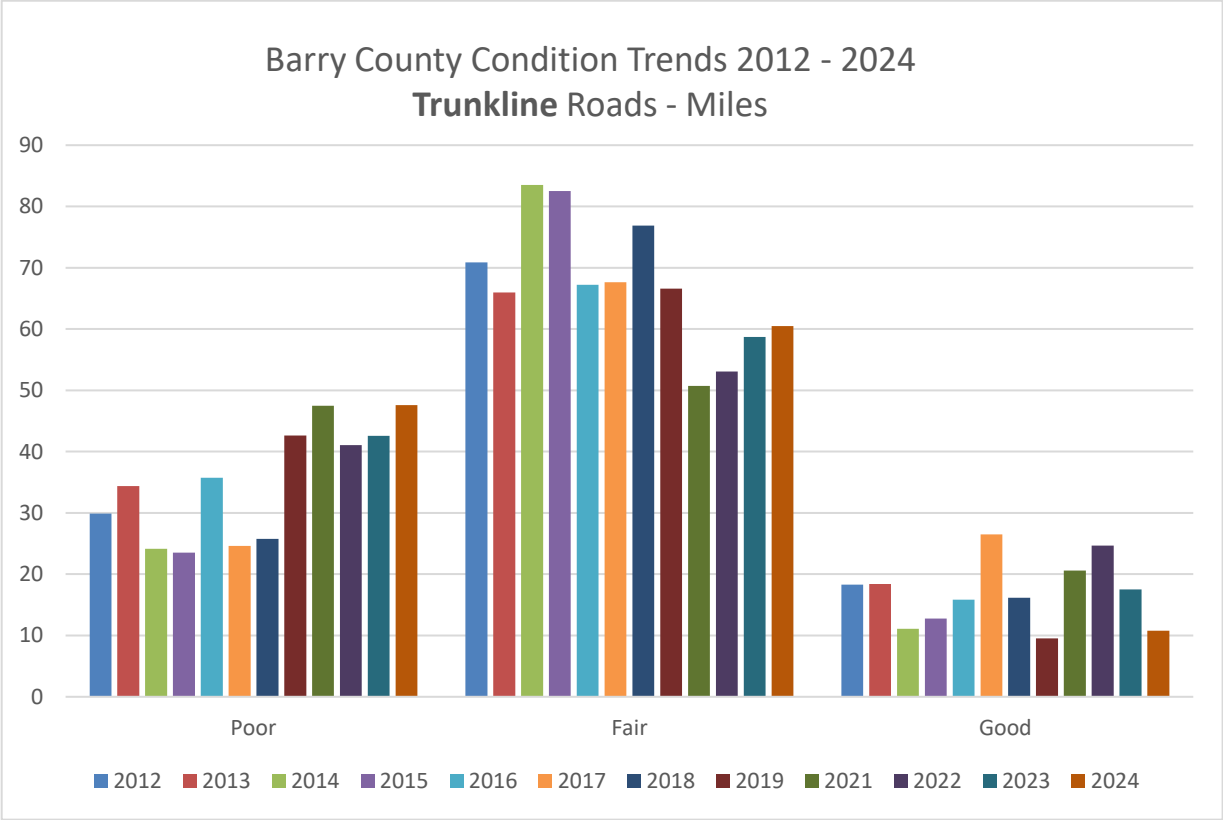


# Condition Trends of Federal-Aid Roads



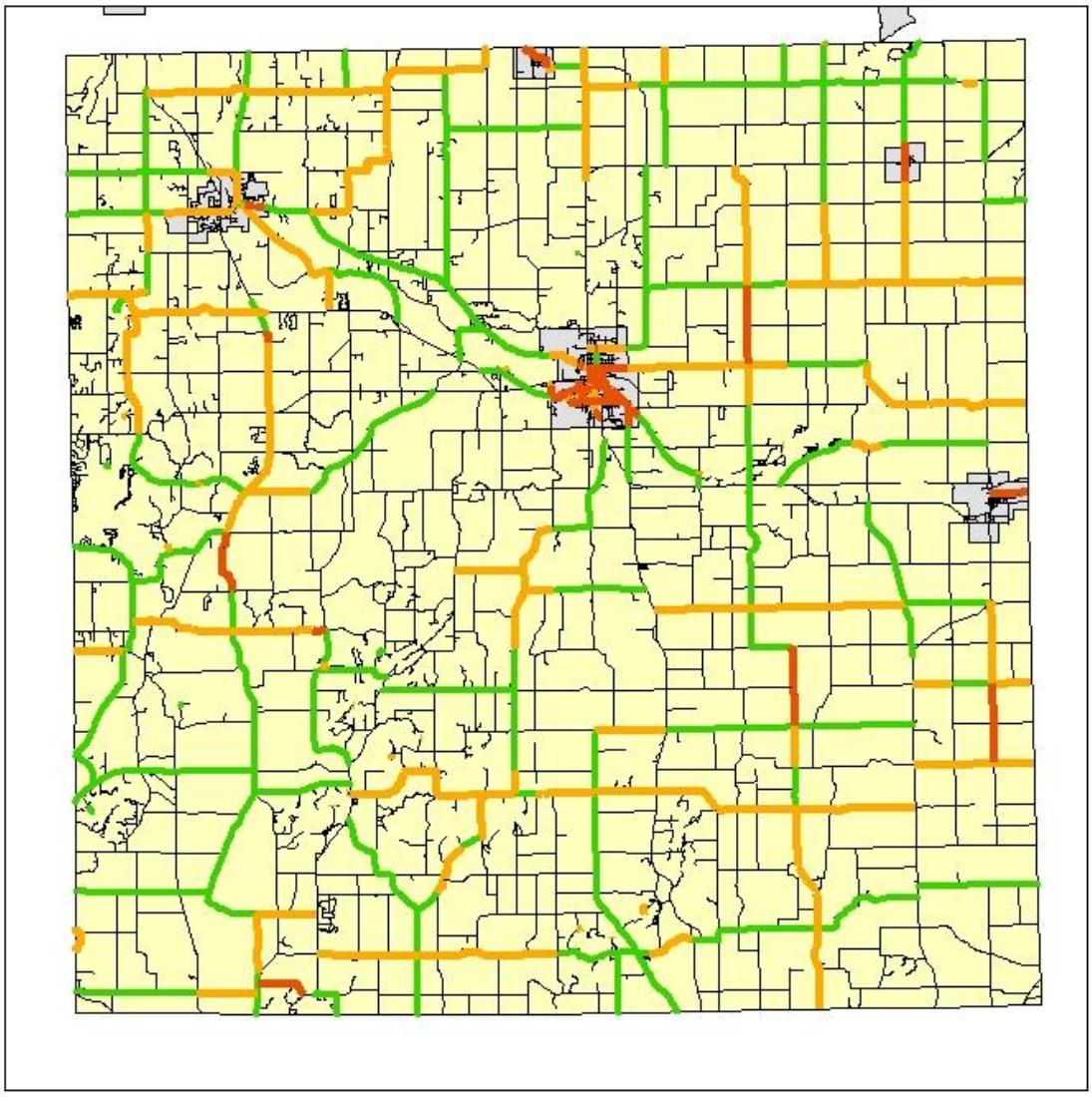
# ROAD CONDITION REPORT FOR BARRY COUNTY




The above bar graphs summarize the condition trends of federal aid roads as rated in all of Barry County over the course of 11 years, grouped by all, non-trunkline-only and trunkline-only. The graphs show that local road agencies in Barry County have made generally steady progress in reducing the mileage of Poor rated roads. Fair rated road mileage has generally held steady for non-trunkline roads and have recently shown a moderate increase for trunkline after a period of decline. The general trend for Good rated mileage has been to increase for non-trunkline, and variance with a recent trend toward decrease for trunkline roads. From the graphs, it appears that local road agencies are doing well overall in keeping the Good and Fair roads maintained while working to improve the Poor rated roads as their budgets permit. Focus for these agencies should continue to be placed on maintaining roads in fair and good condition while performing structural improvement on those in poor condition in order to continue decreasing the amount of poor road mileage countywide. It appears that MDOT's previous efforts at applying fixes to fair roads to prevent them from falling to poor have not been continued to the same extent. It is important to administer capital preventative maintenance treatments that are less expensive before higher cost structural improvements become necessary.

The following pages contain maps showing the location and condition of federal aid roads in Barry County:

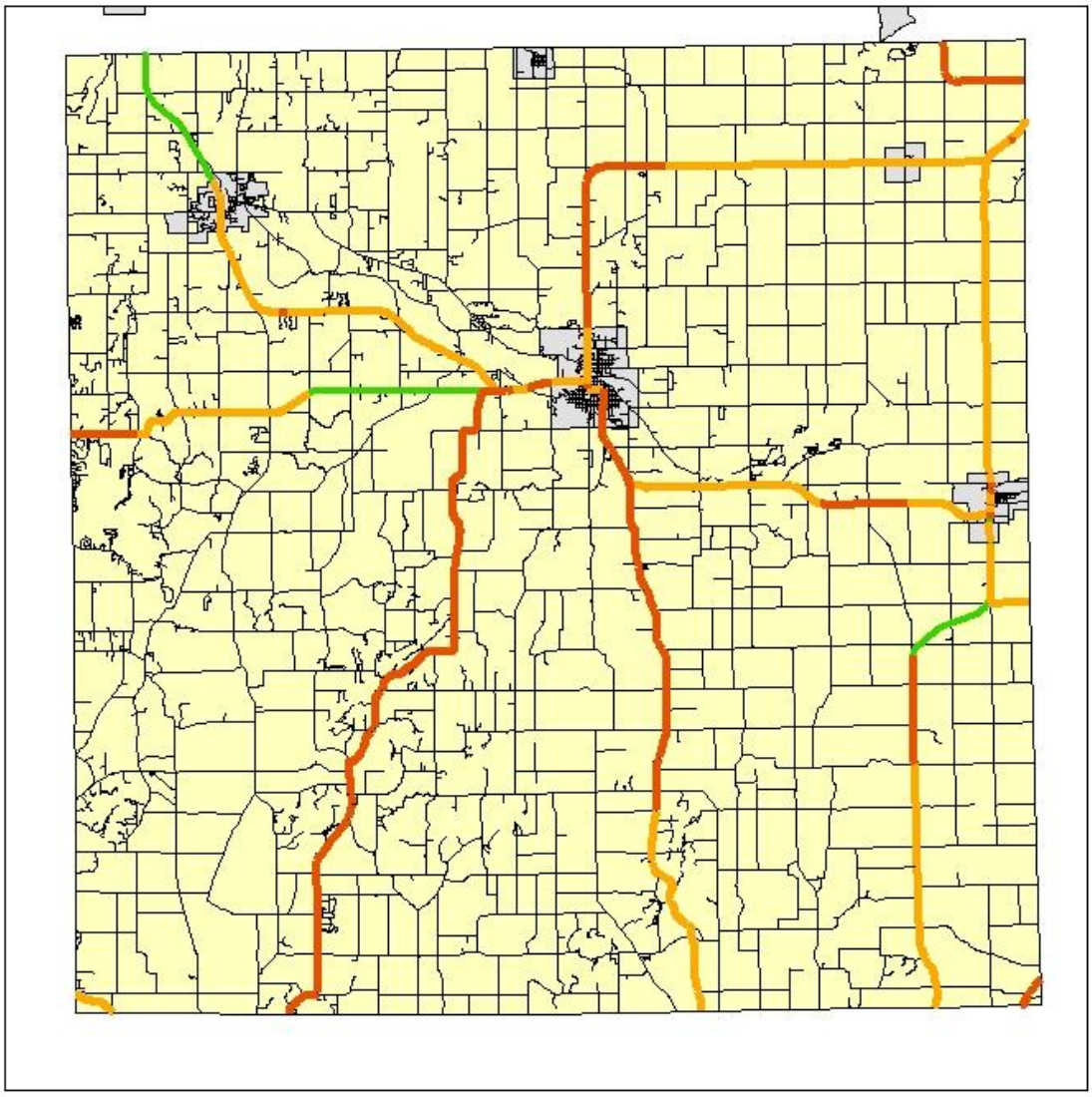
## Barry County Non-Trunkline Federal Aid Road Conditions 2024



**PASER Road Conditions**

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

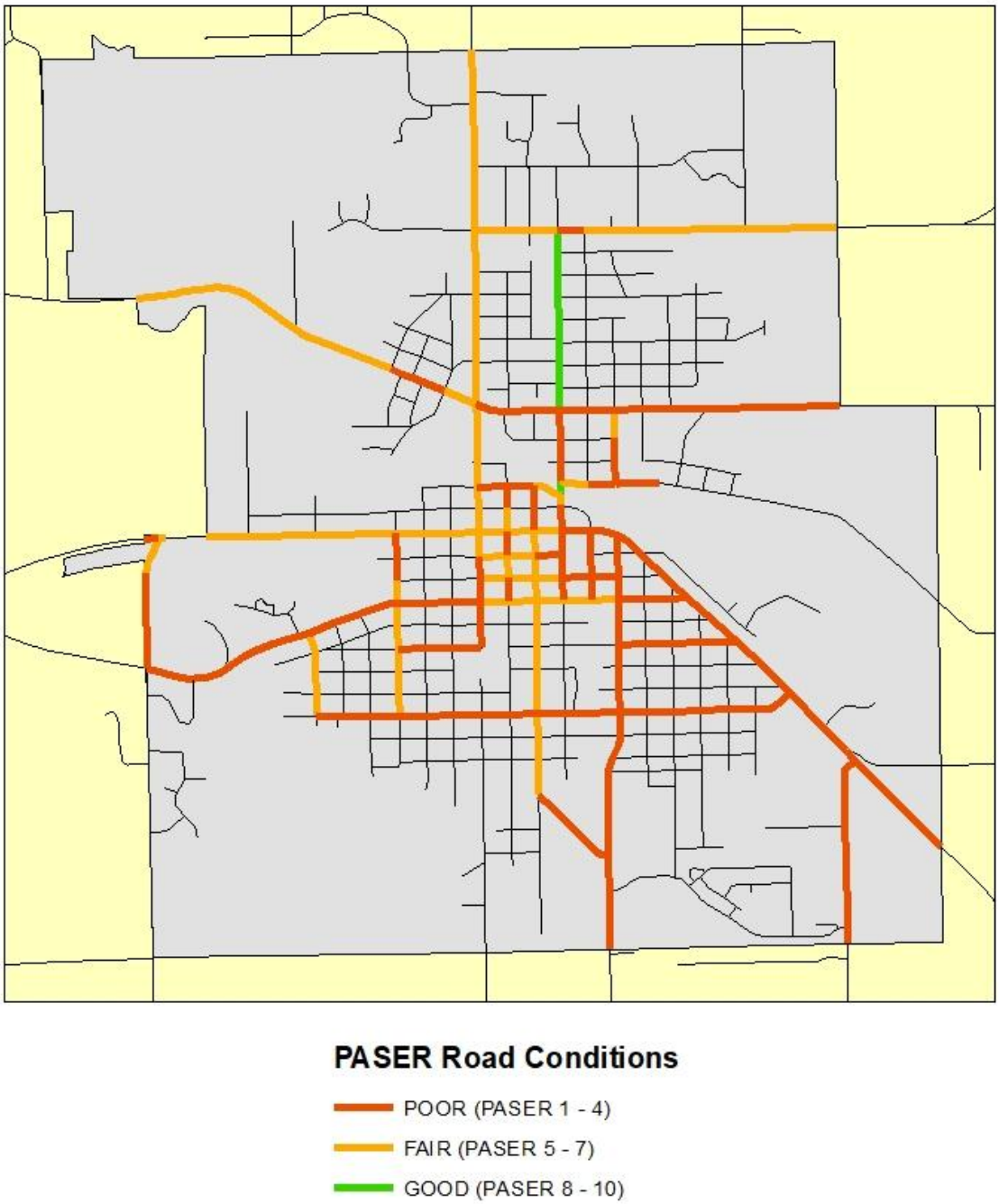
## Barry County Trunkline Federal Aid Road Conditions 2024



**PASER Road Conditions**

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

City of Hastings Federeal Aid Road Conditions 2024



# Contact Information

For more information regarding the Barry County Road Condition report, contact:

- **Barry County Road Commission**
  1725 West M-43 Highway • Hastings, Michigan • 49058
  (269) 945-3449 • administration@barrycrc.org

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