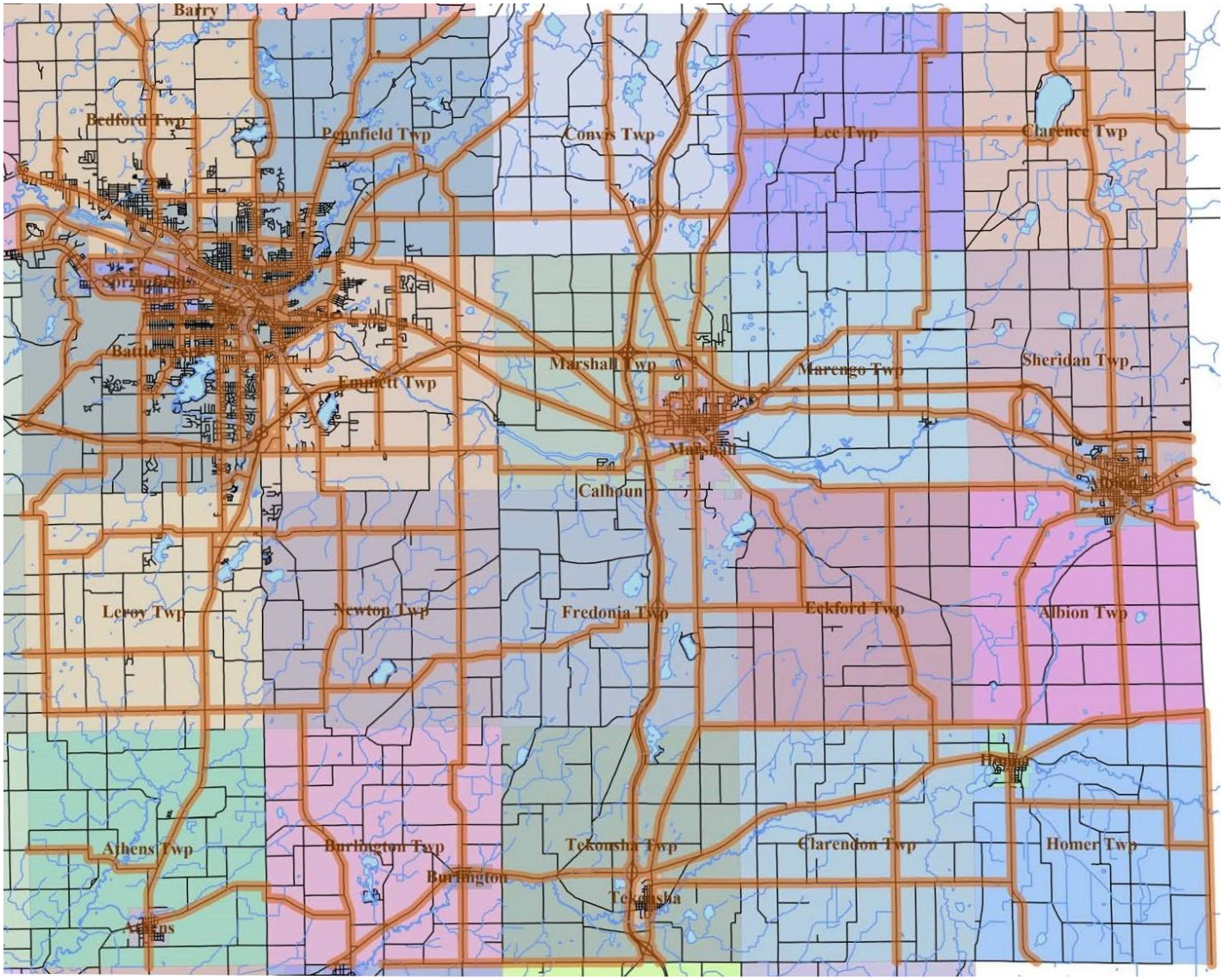

FEDERAL AID ROAD CONDITION REPORT FOR CALHOUN COUNTY

2024

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

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The Kalamazoo Area Transportation Study working under contract with he Southcentral Michigan Planning Council coordinated the data collection of Federal Aid road inventory for Calhoun County in 2024. 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 Calhoun County, there are:

- **696 miles of Federal-aid roads**. This includes roads that are maintained by the Michigan Department of Transportation, the Calhoun County Road Department, and the cities and villages within the county. Of the almost 700 Federal-Aid miles in Calhoun County, there are:
- **290 miles of Trunkline roadways** maintained by the Michigan Department of Transportation
- **307 miles of County Roads** maintained by the Calhoun County Road Department
- **99 miles of City Streets** maintained by the incorporated cities and villages in 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 Calhoun County was rated in 2021. In 2022 and 2023 the rating efforts were generally expended on those areas traditionally done in odd and even-numbered years, with some changes to make year-to-year efforts more equal. In 2024 the revised even-year schedule of roads were rated. This report takes the results of the most recent ratings for the entire county federal aid system and compares them with those from 2016 on to analyze the current status and discern any trends.

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.

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The following table illustrates PASER ratings for asphalt pavements, which constitute the majority of roads in Calhoun 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' 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	7 to 9	$7,500	$1,375
Fog Seal Coat	0	8	$6,000	$1,125
One Course Non- Structural Overlay	10	5 to 6	$165,000	$11,000
Milling and One Course Non- Structural Overlay	10	4 to 5	$185,000	$13,000
Single Course Chip Seal	7	6 to 7	$36,000	$4,100
Single Chip and Fog Seal	9	5 to 6	$42,000	$4,700
Structural Crush & Shape	25	2 to 3	$425,000	$12,000
Full-Depth Reconstruction	30	1 to 2	$1,000,000	$17,000

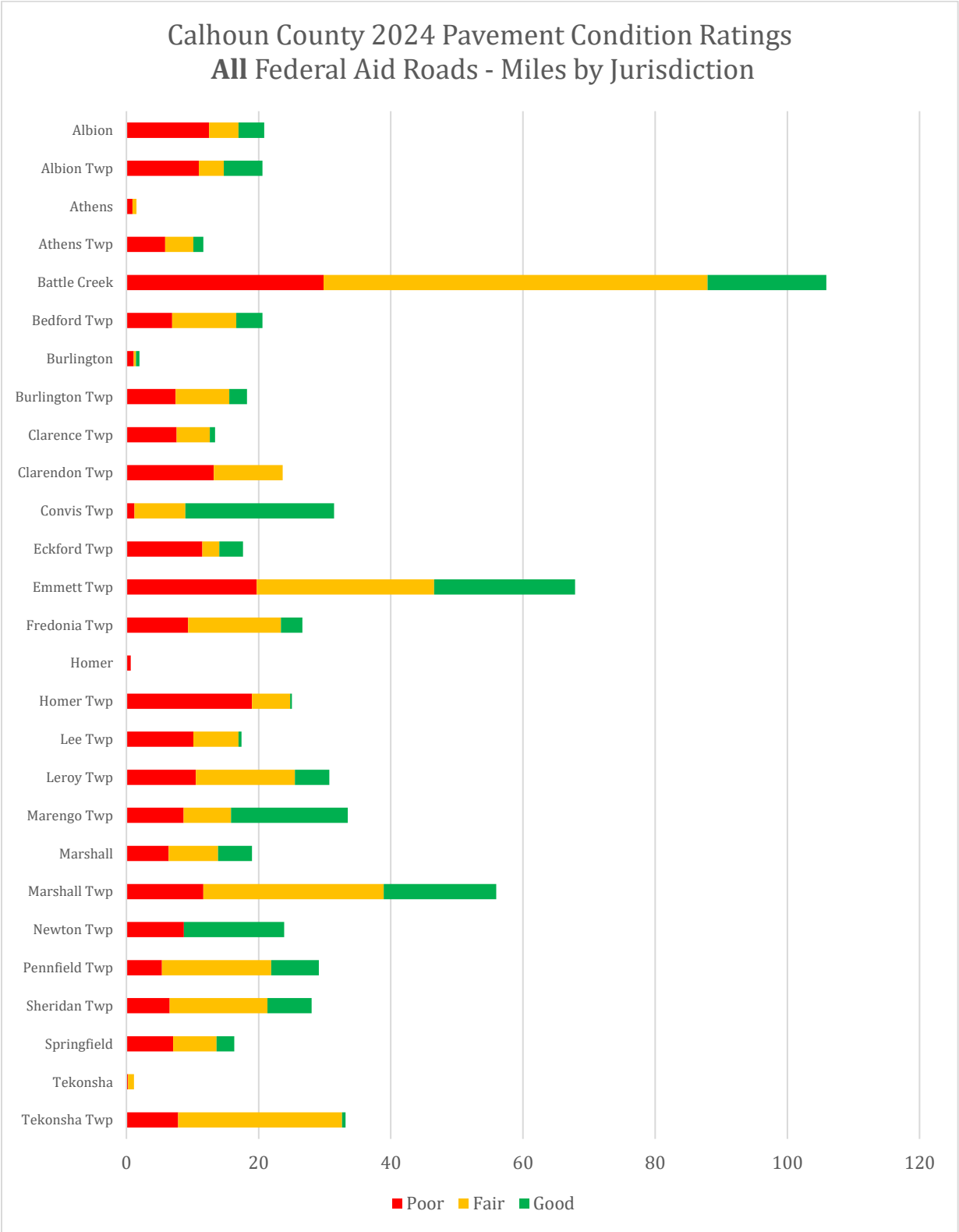
Capital Preventative Maintenance and Reconstructive Treatments

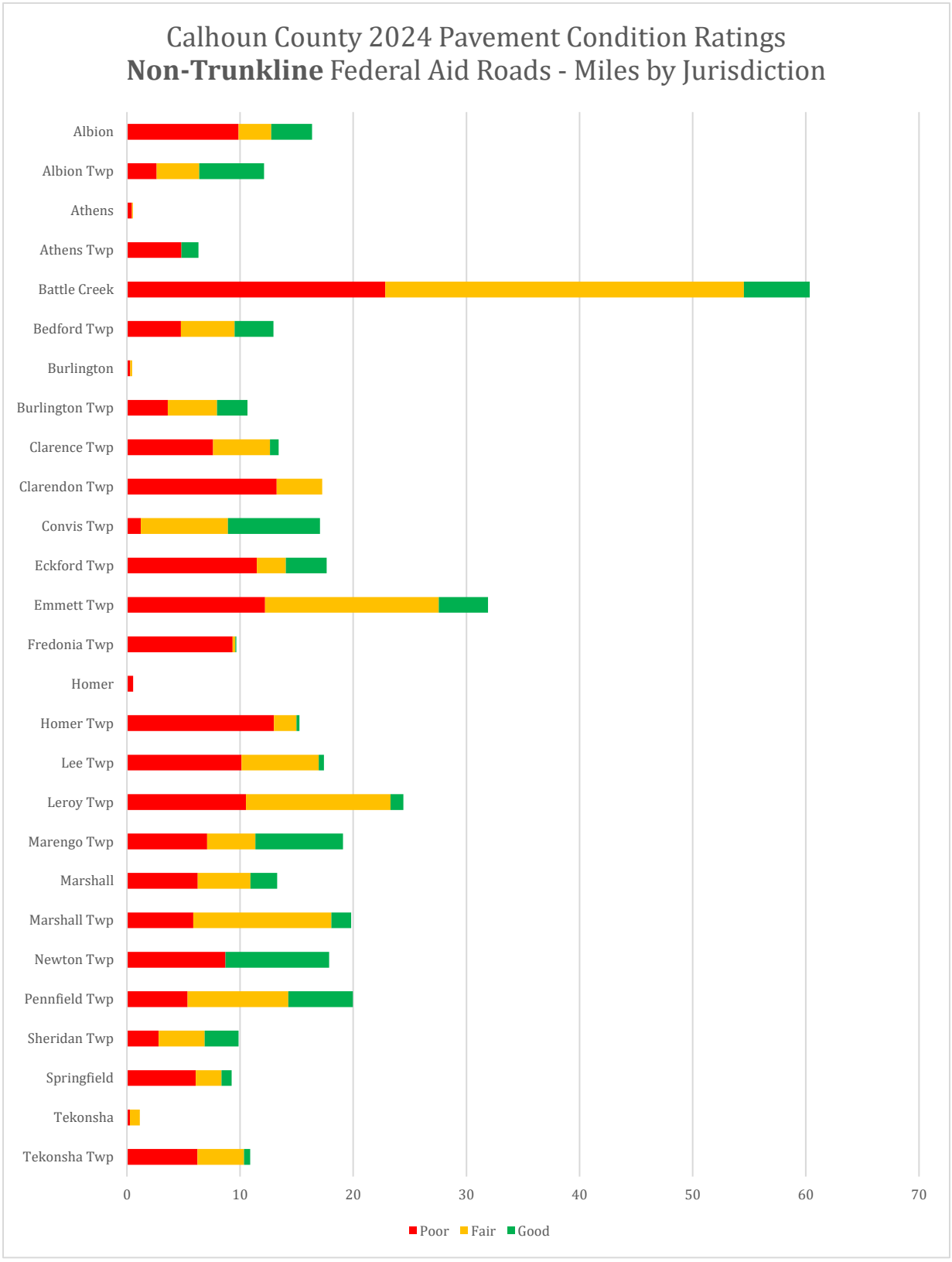
Table 2 details historical cost, lifespan, and rating of pavement treatment types that have been used in Calhoun County. These treatments range from the minimal (overband crack filling) to major construction. As noted, these treatments and costs are historical. The costs do not reflect recent steep inflation but adequately demonstrate the magnitude of differences between various treatment options. 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 CALHOUN COUNTY

Summary of 2024 Ratings




Calhoun County 2024 Pavement Condition Ratings
Non-Trunkline Federal Aid Roads - Miles by Jurisdiction
Albion
Albion Twp
Athens
Athens Twp
Battle Creek
Bedford Twp
Burlington
Burlington Twp
Clarence Twp
Clarendon Twp
Convis Twp
Eckford Twp
Emmett Twp
Fredonia Twp
Homer
Homer Twp
Lee Twp
Leroy Twp
Marengo Twp
Marshall
Marshall Twp
Newton Twp
Pennfield Twp
Sheridan Twp
Springfield
Tekonsha
Tekonsha Twp
0
10
20
30
40
50
60
70
Poor
Fair
Good

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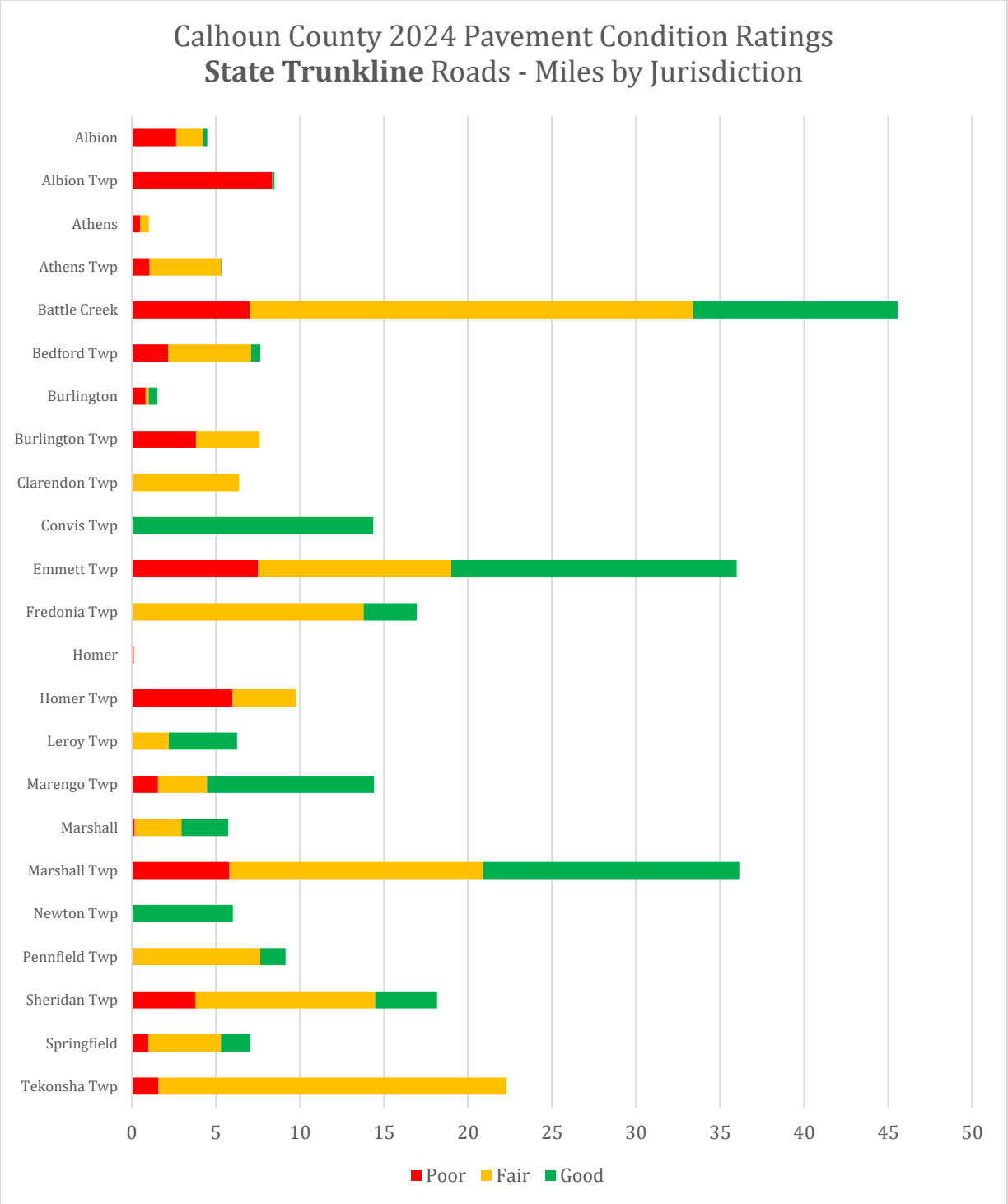

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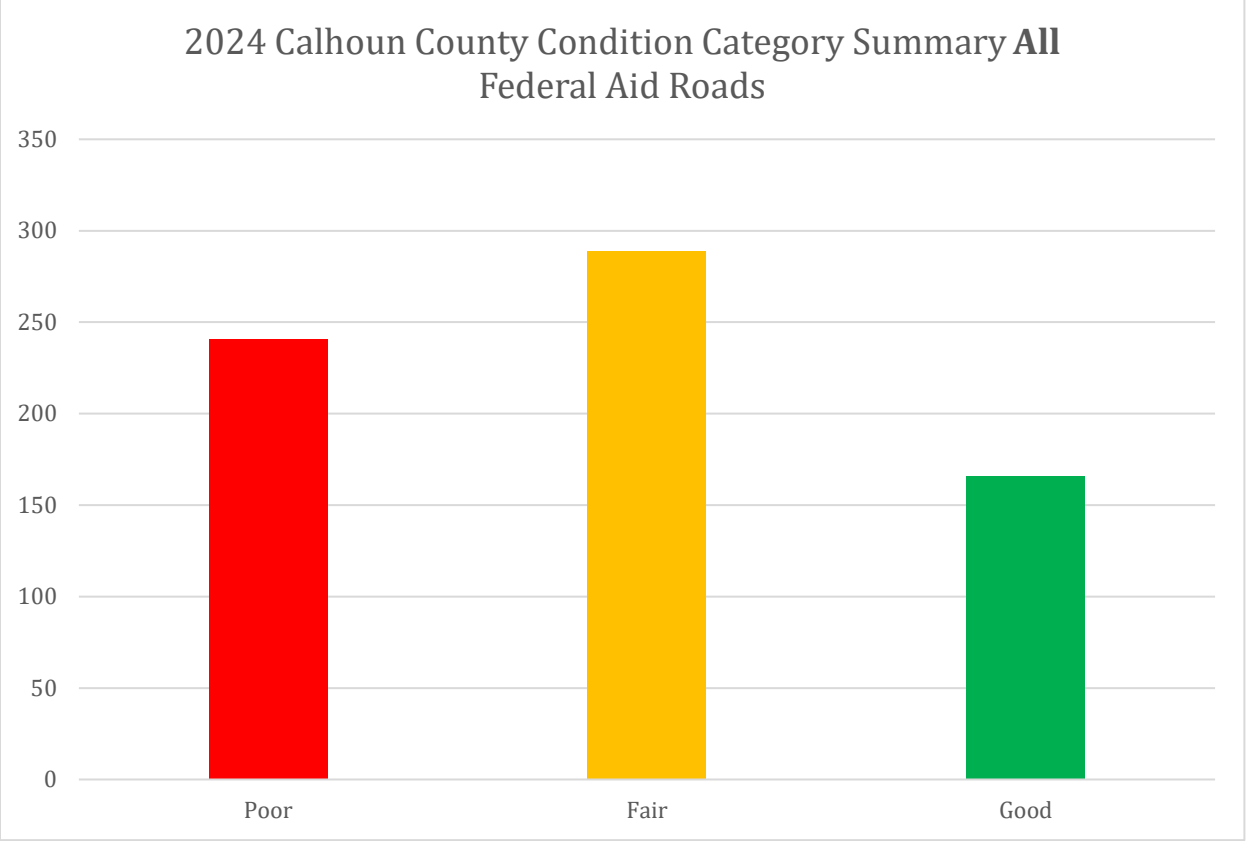

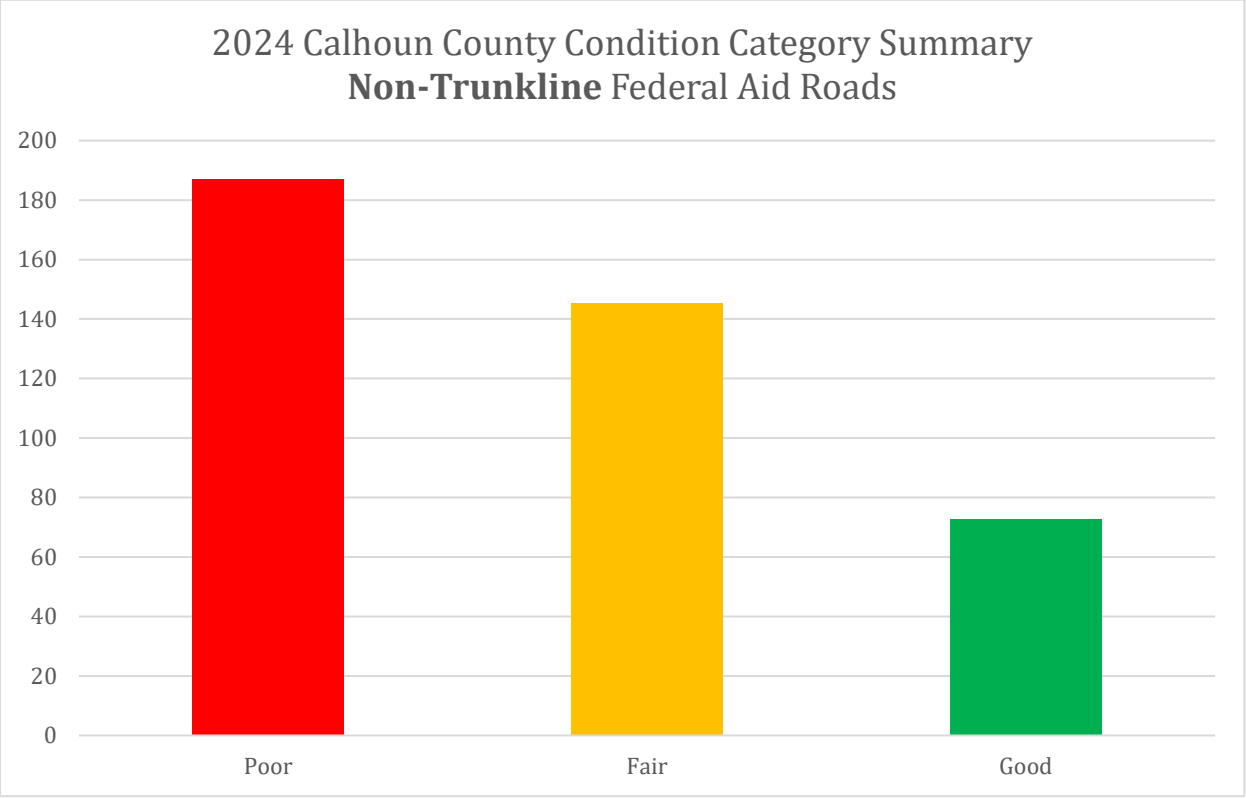

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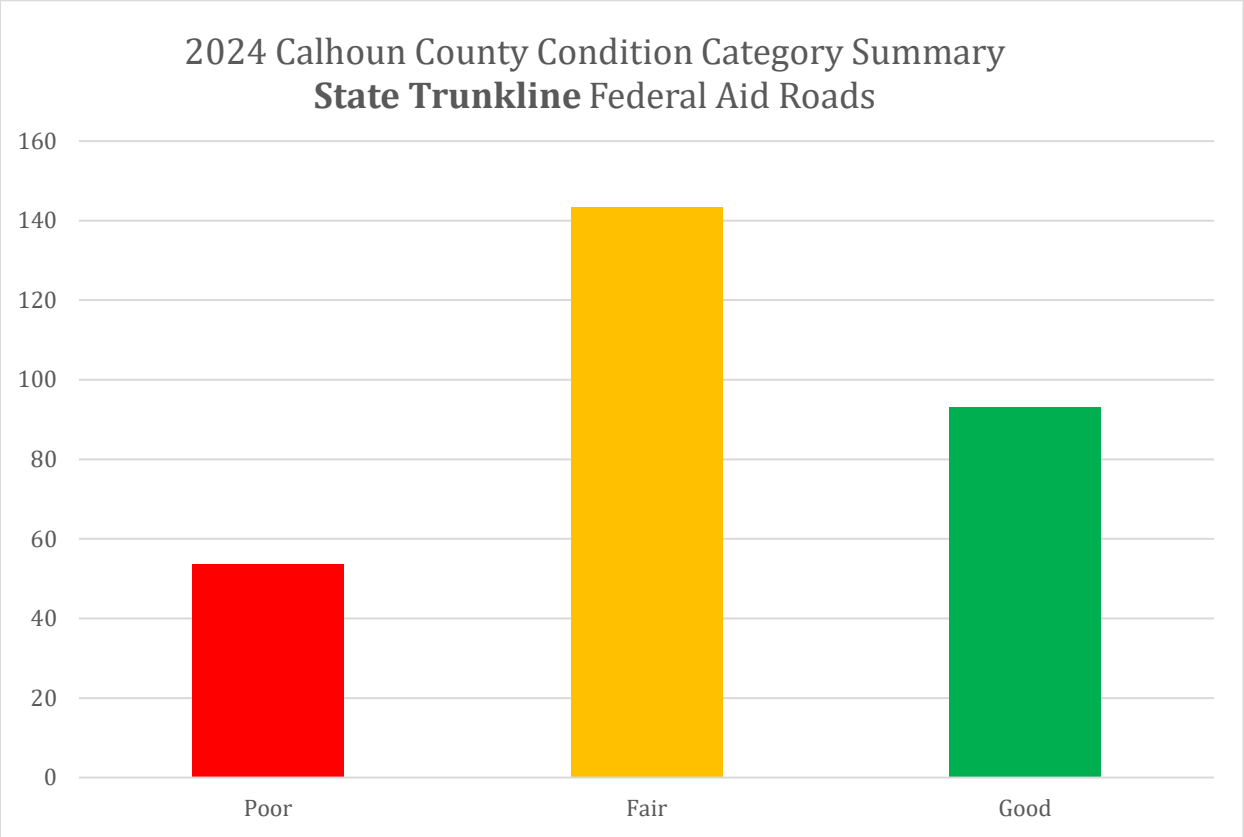
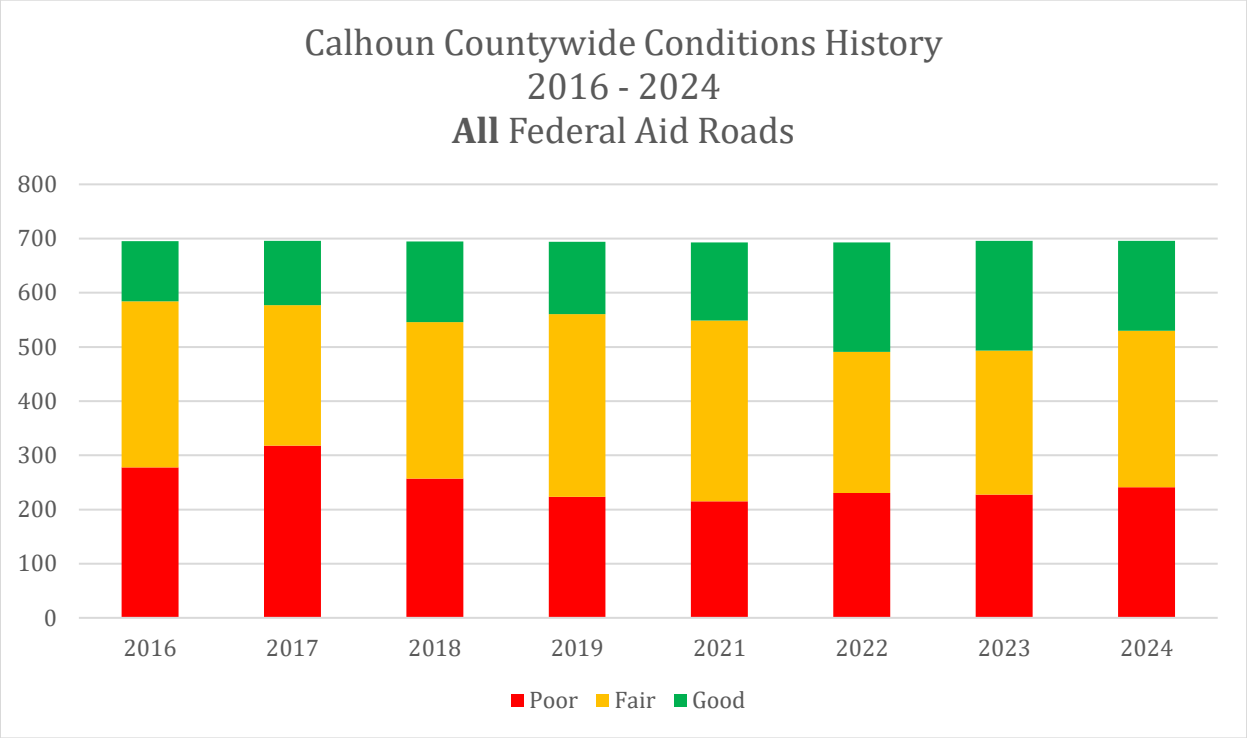
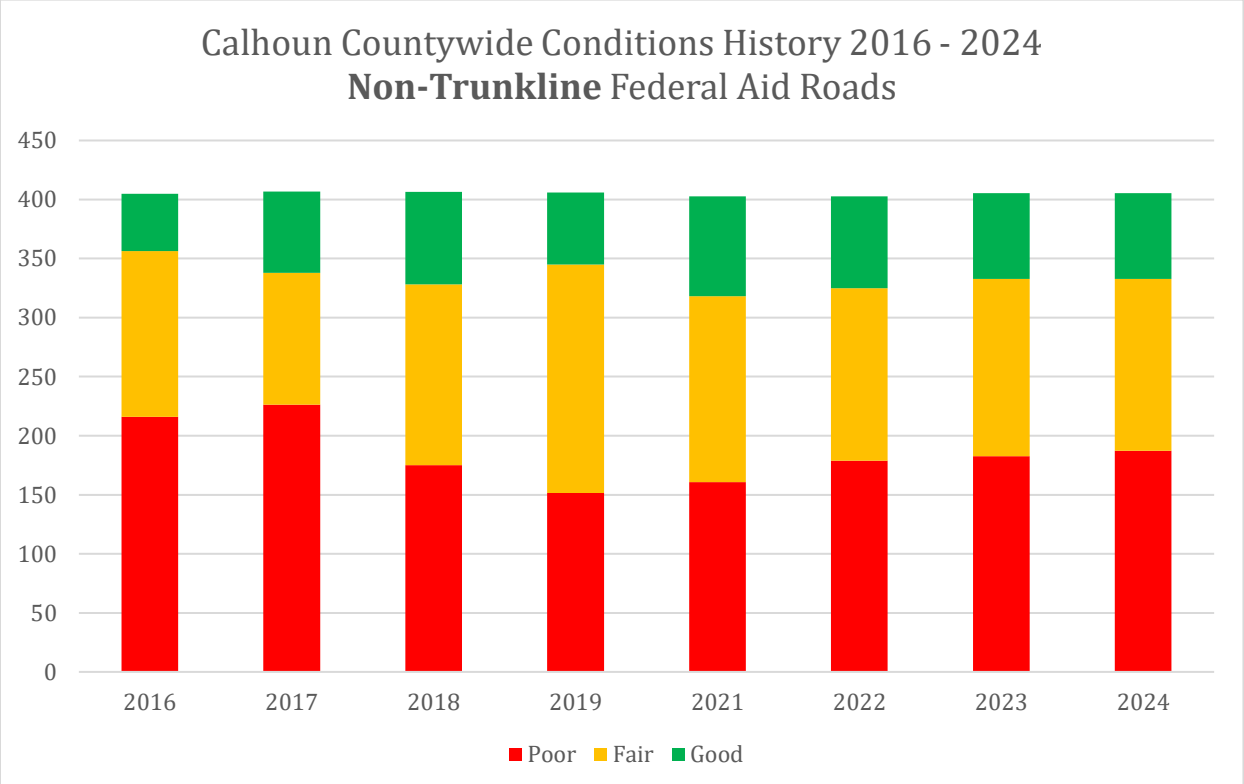
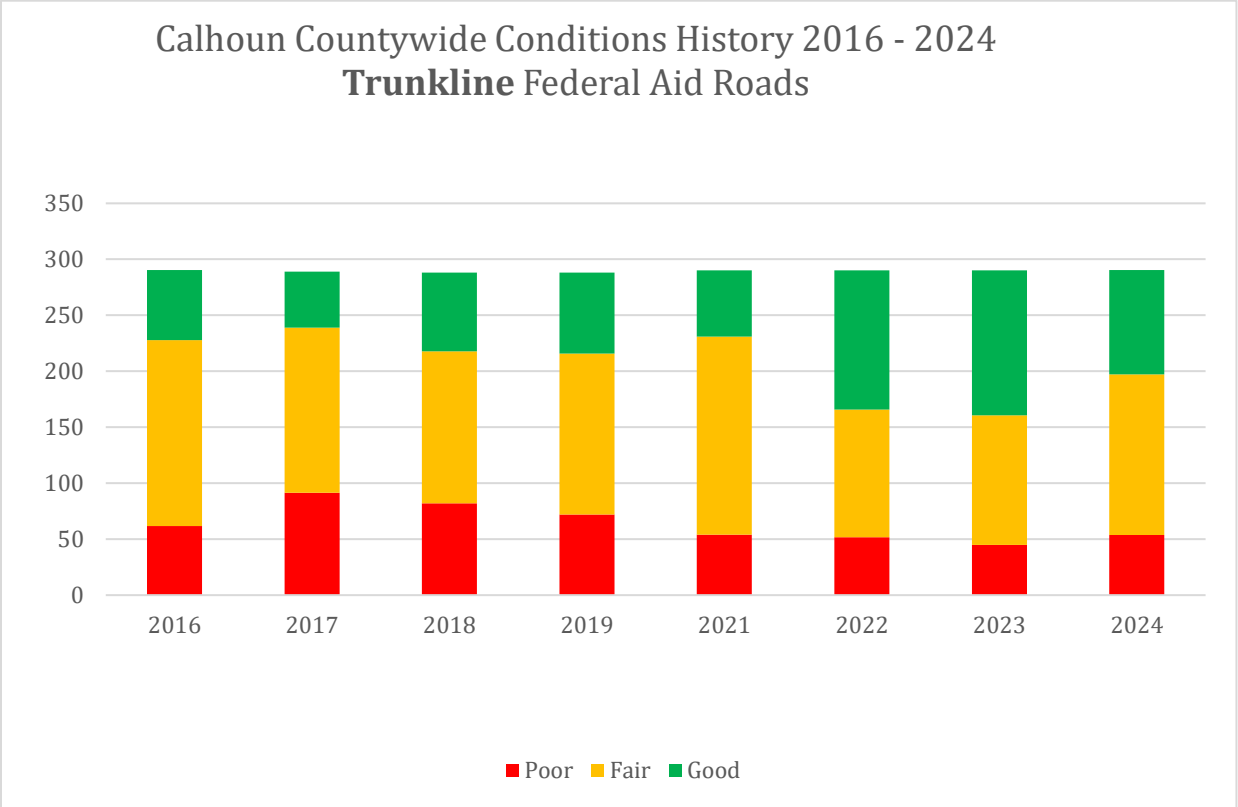


Federal Aid Conditions History and Trends



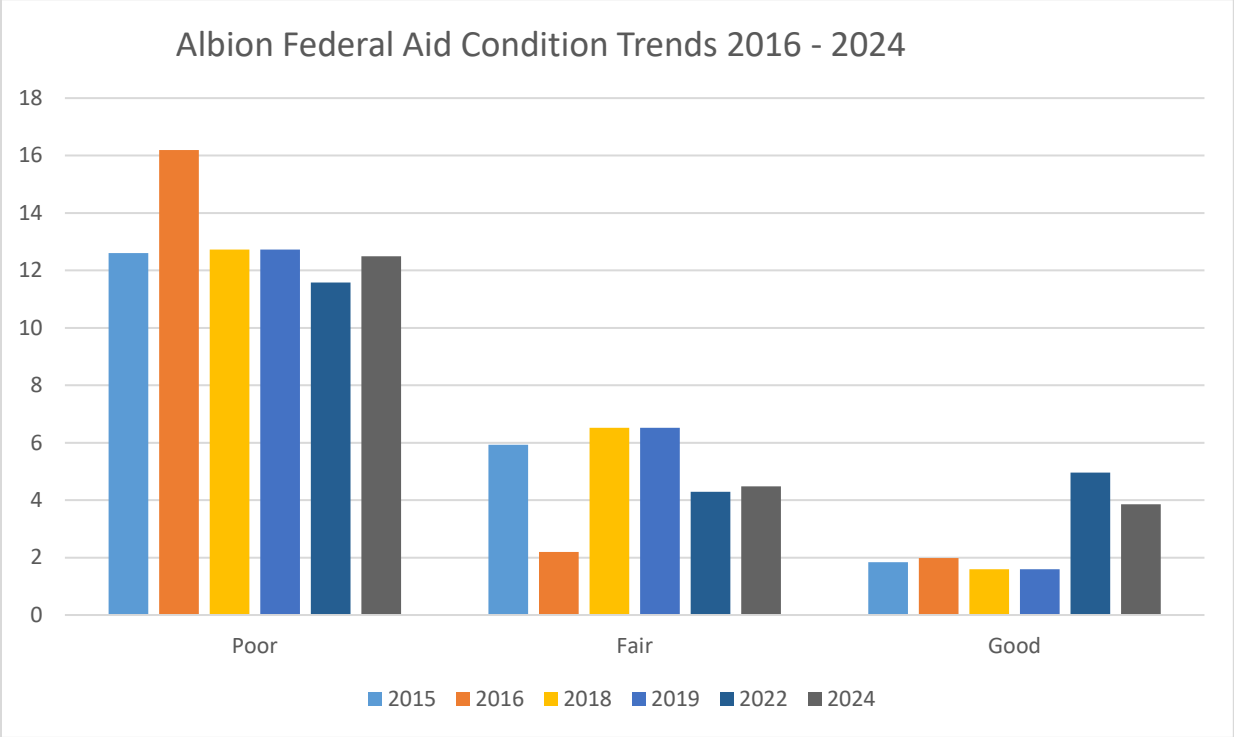


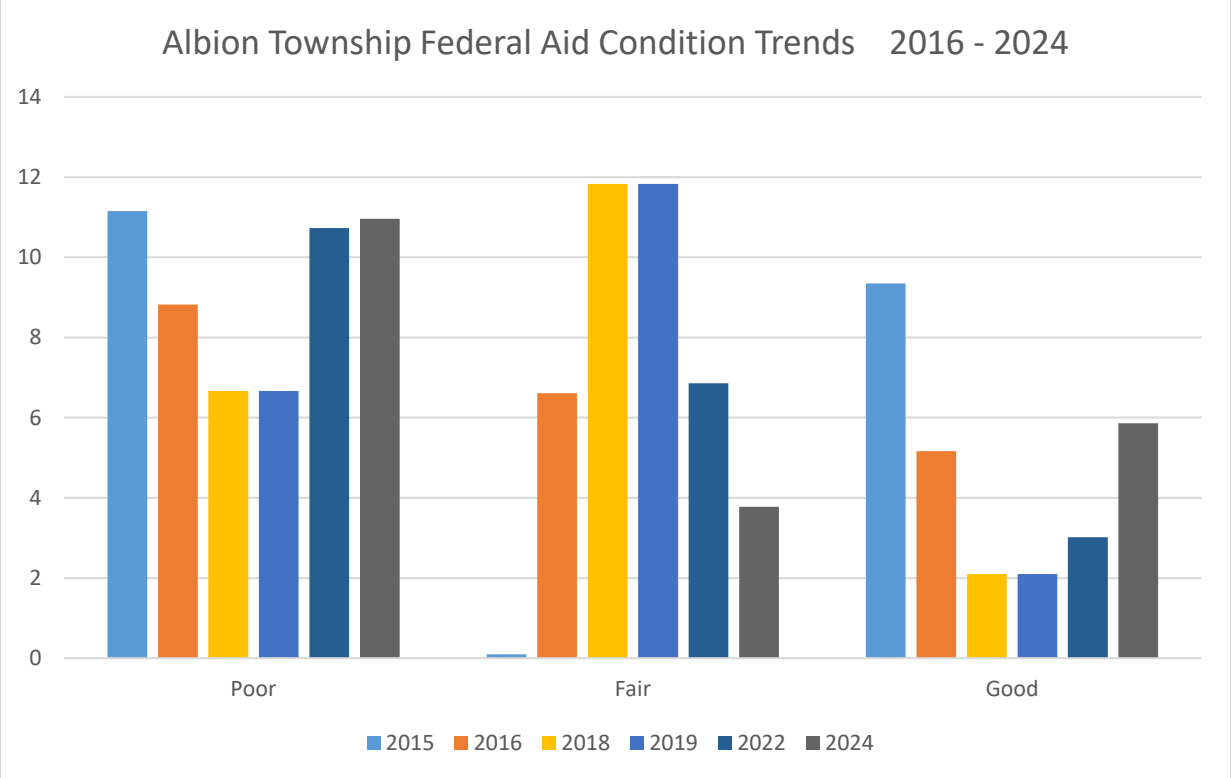


The charts above reflect the progression of Calhoun County's federal-aid roads over an eight-year period. Generally, there was a decrease in the number of poor-rated miles from 2016 until 2019 followed by a current trend of increase. Conversely, , the mileage of Fair rated roads trended the opposite direction. The mileage of good rated roads has cycled up and down for the entire review period. For 2024 there was a significant reduction in Good rated road mileage driven trunkline roads despite recent significant reconstruction efforts on freeways.

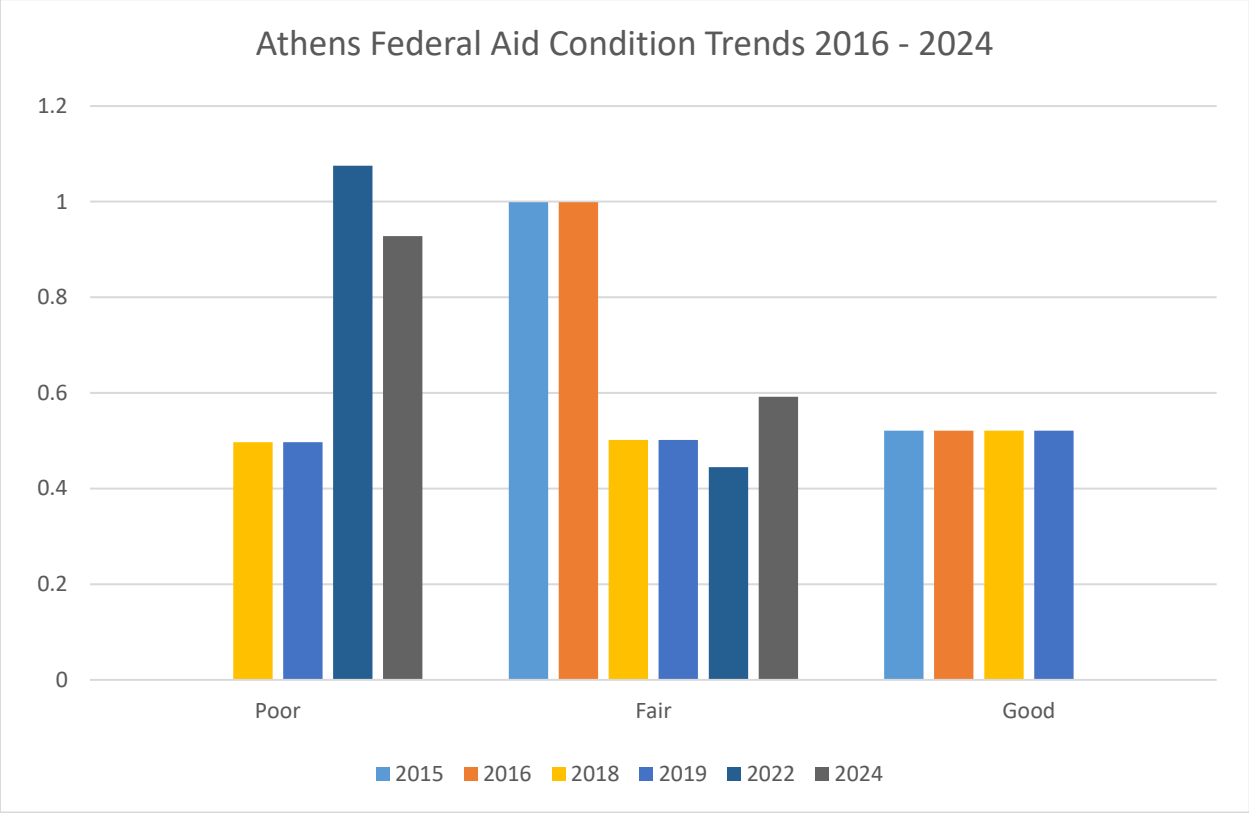
When looking at township breakdowns from 2016 to 2024 on the following pages of this document, it is apparent that in most jurisdictions the majority of road miles are Fair and Poor, with Good roads constituting very little overall. There are townships, however, where the has been a marked trend of decreasing Poor road mileage. It is likely that those have dedicated road improvement millages that are being used effectively.

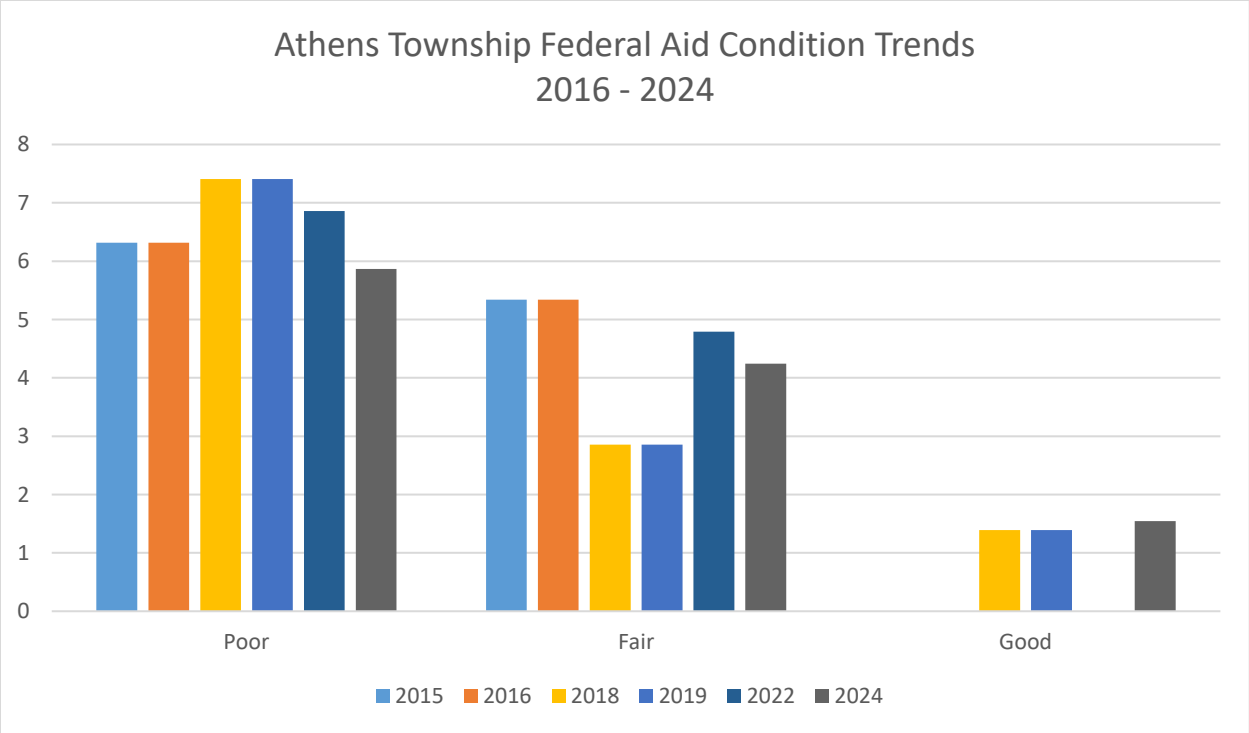
Federal Aid Road Condition Trends





Federal Aid Road Condition Trends





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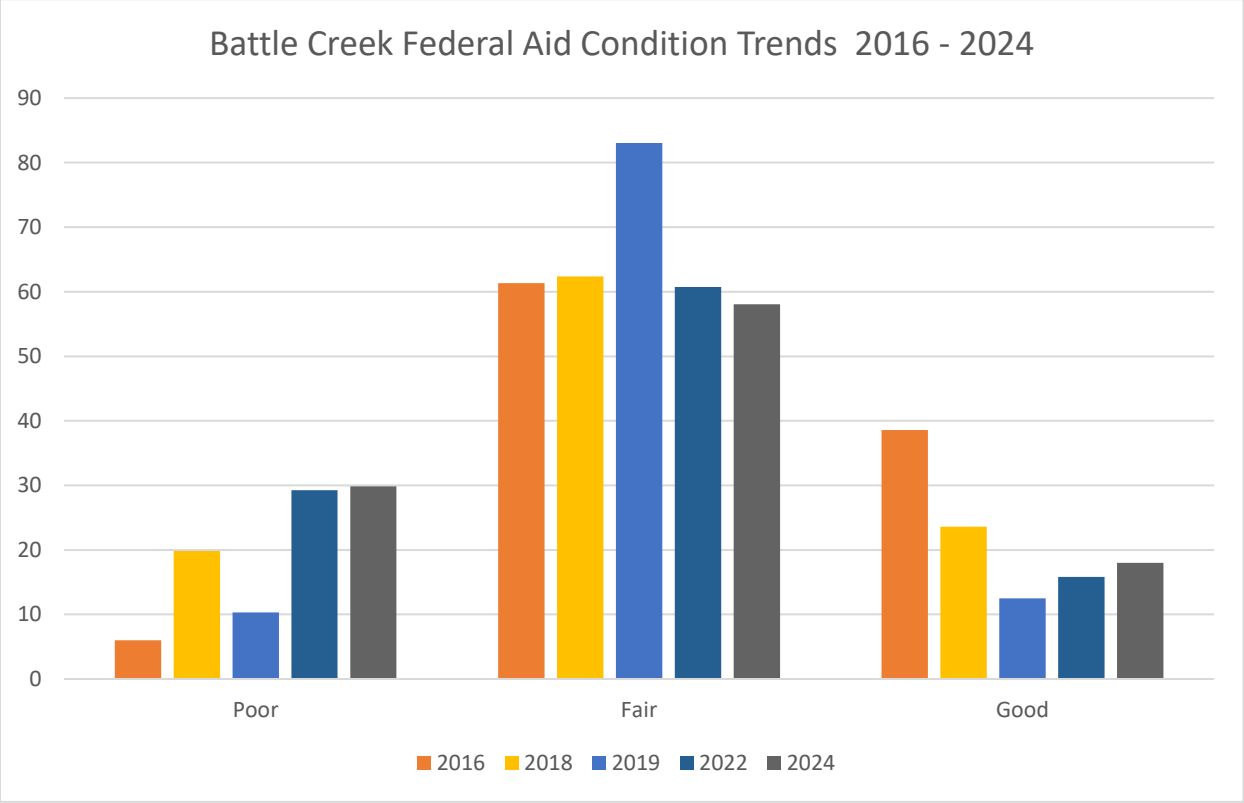

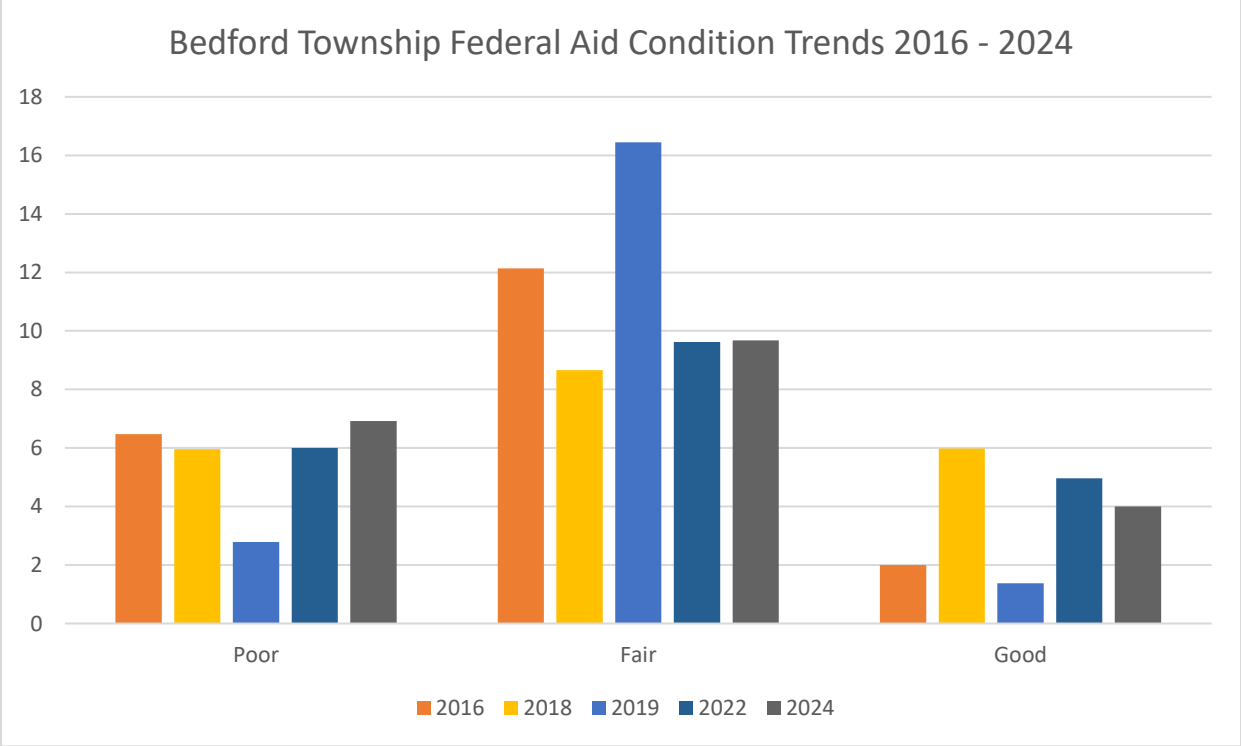

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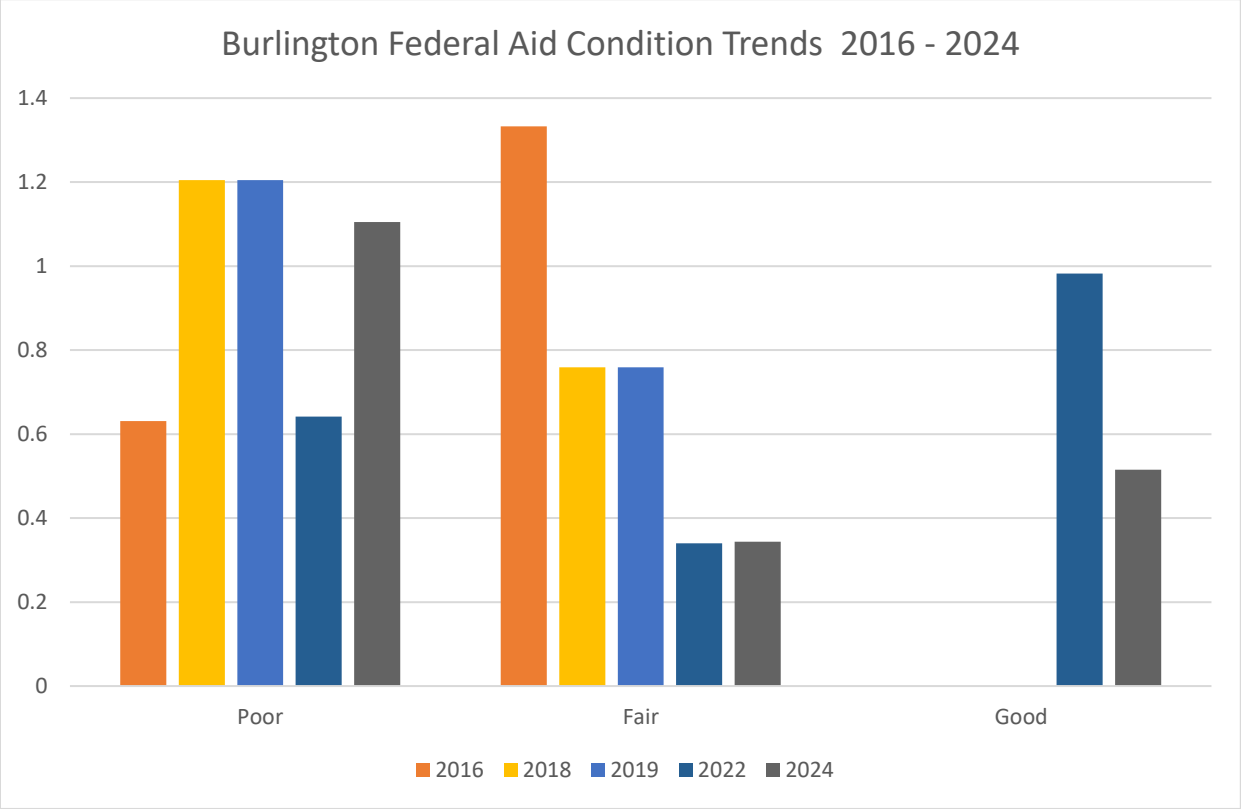

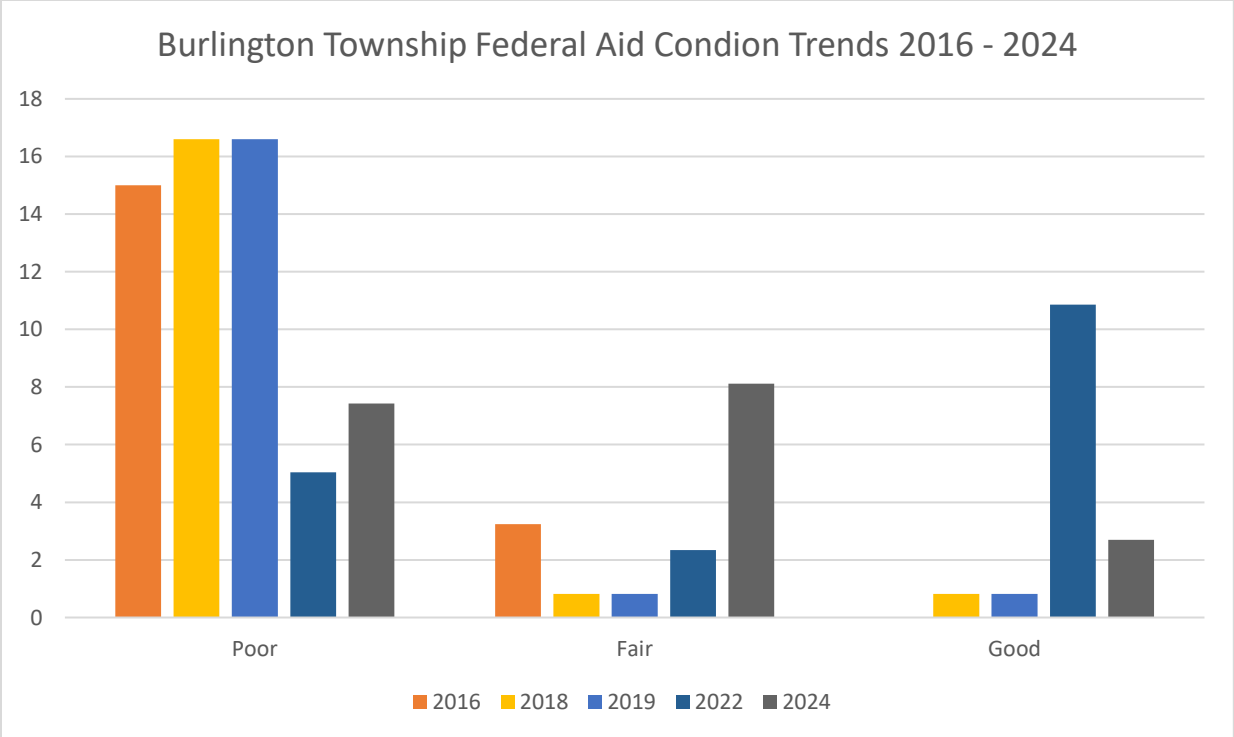

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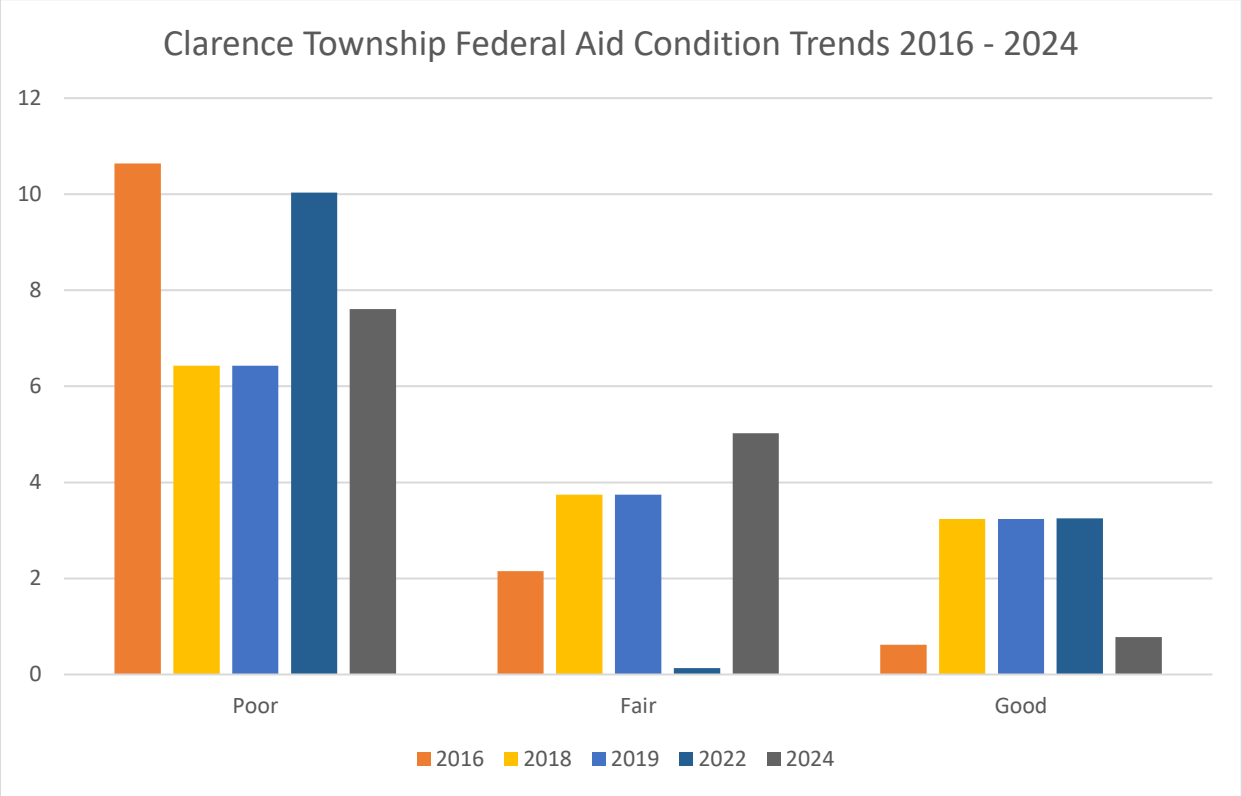

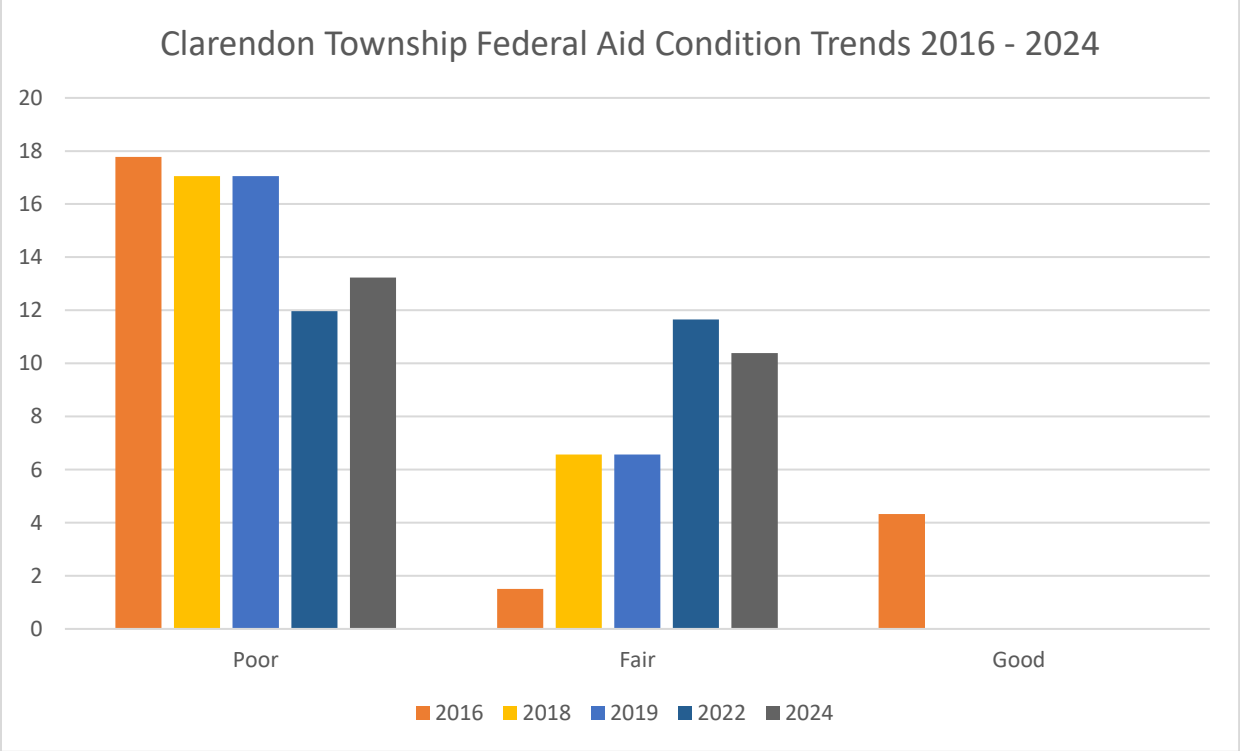

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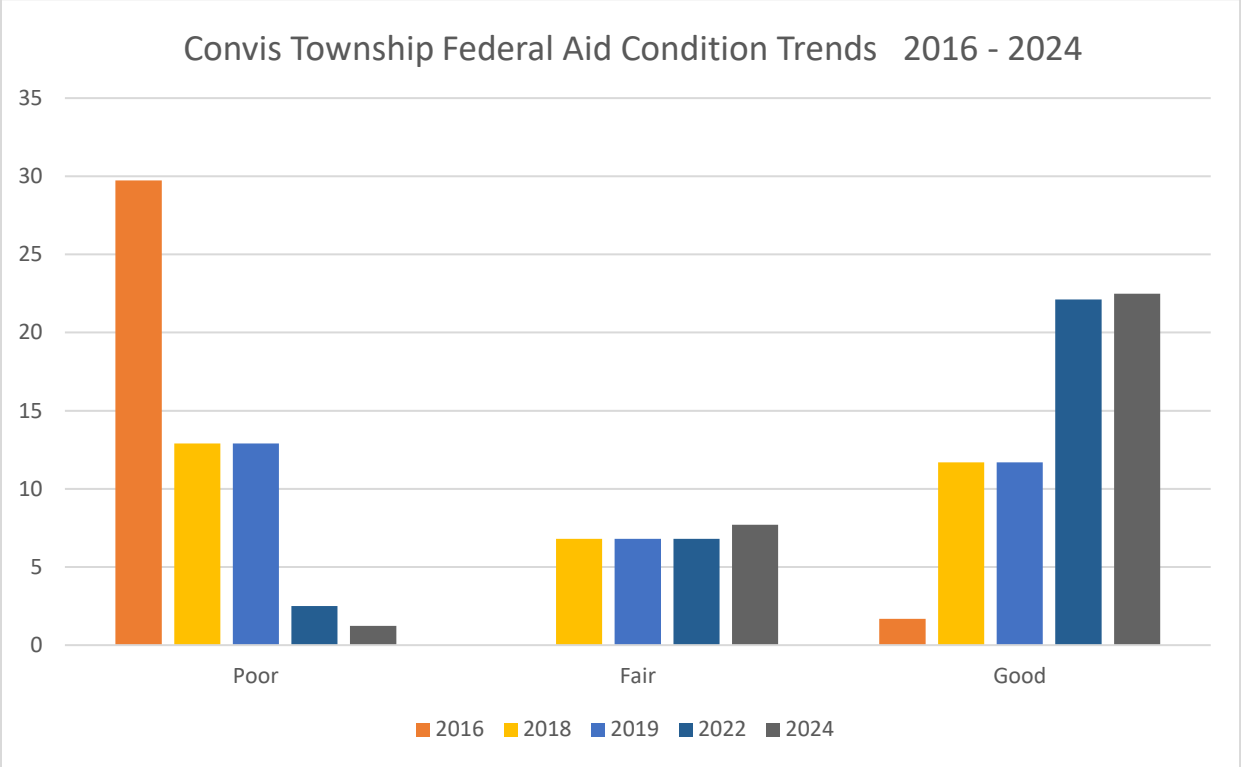

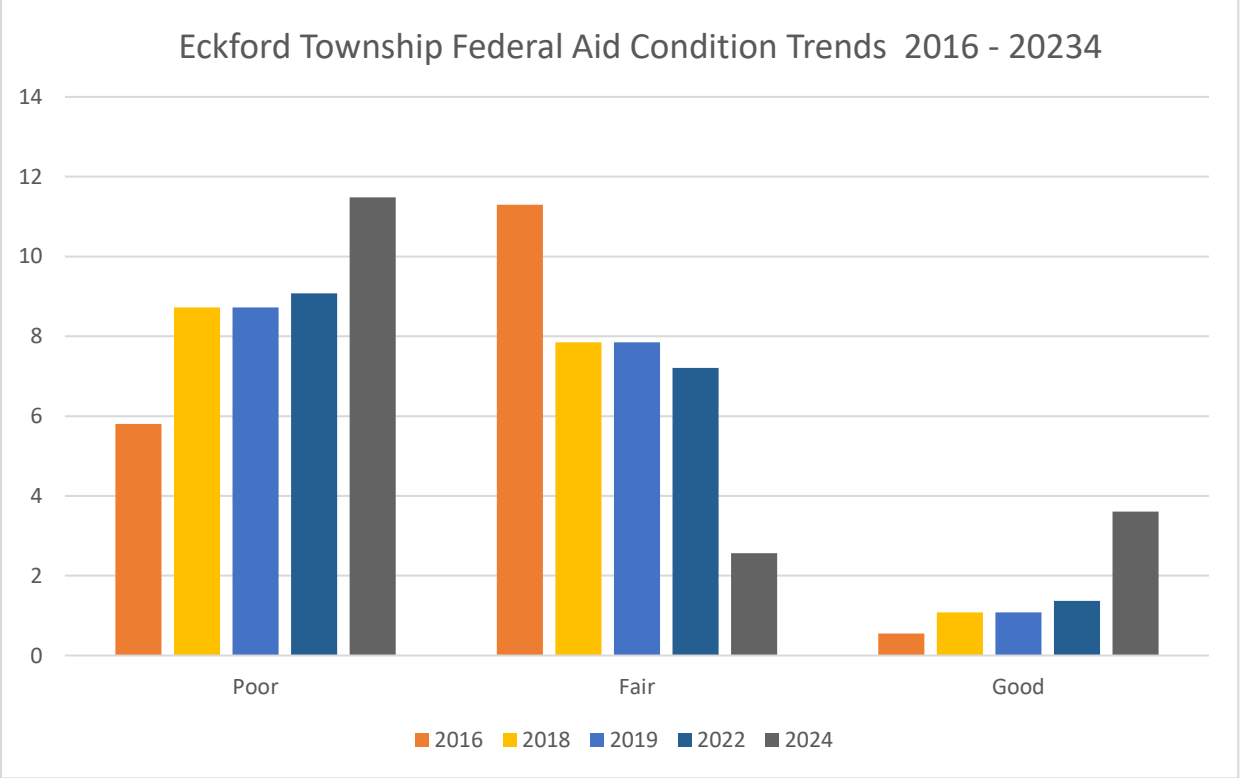

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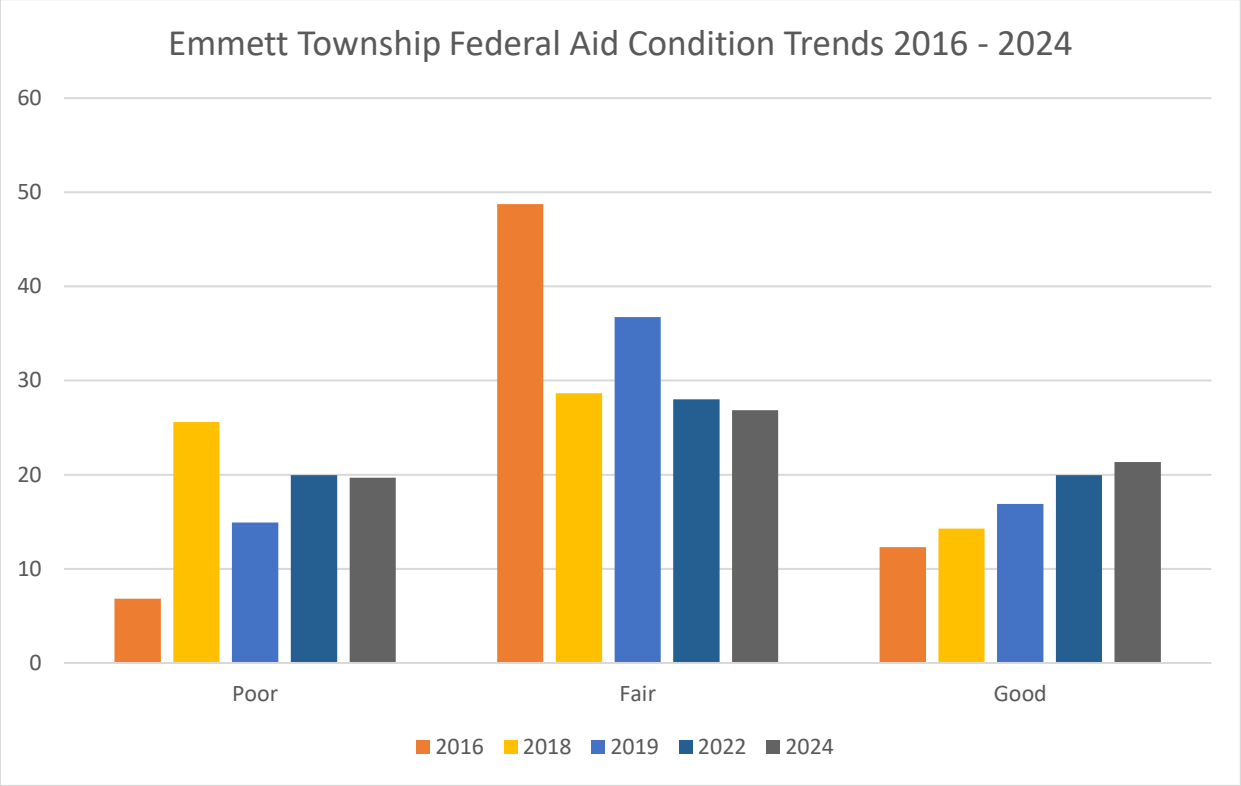

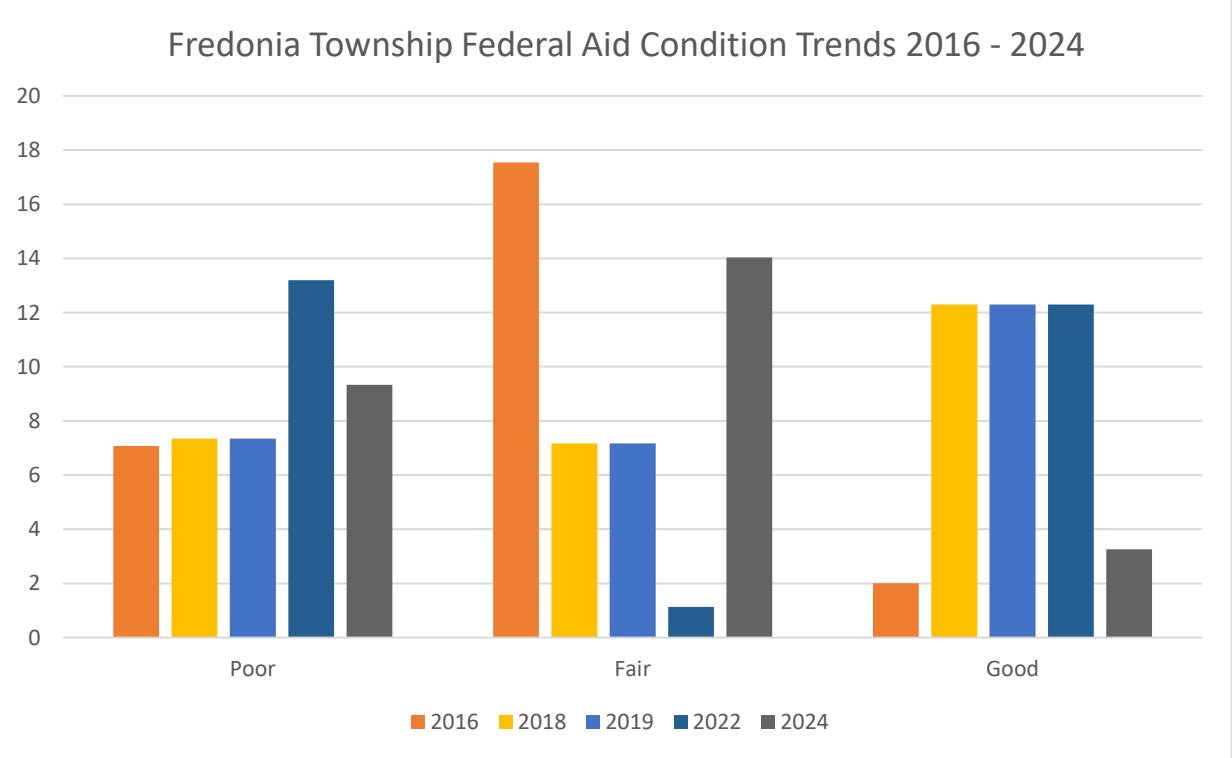

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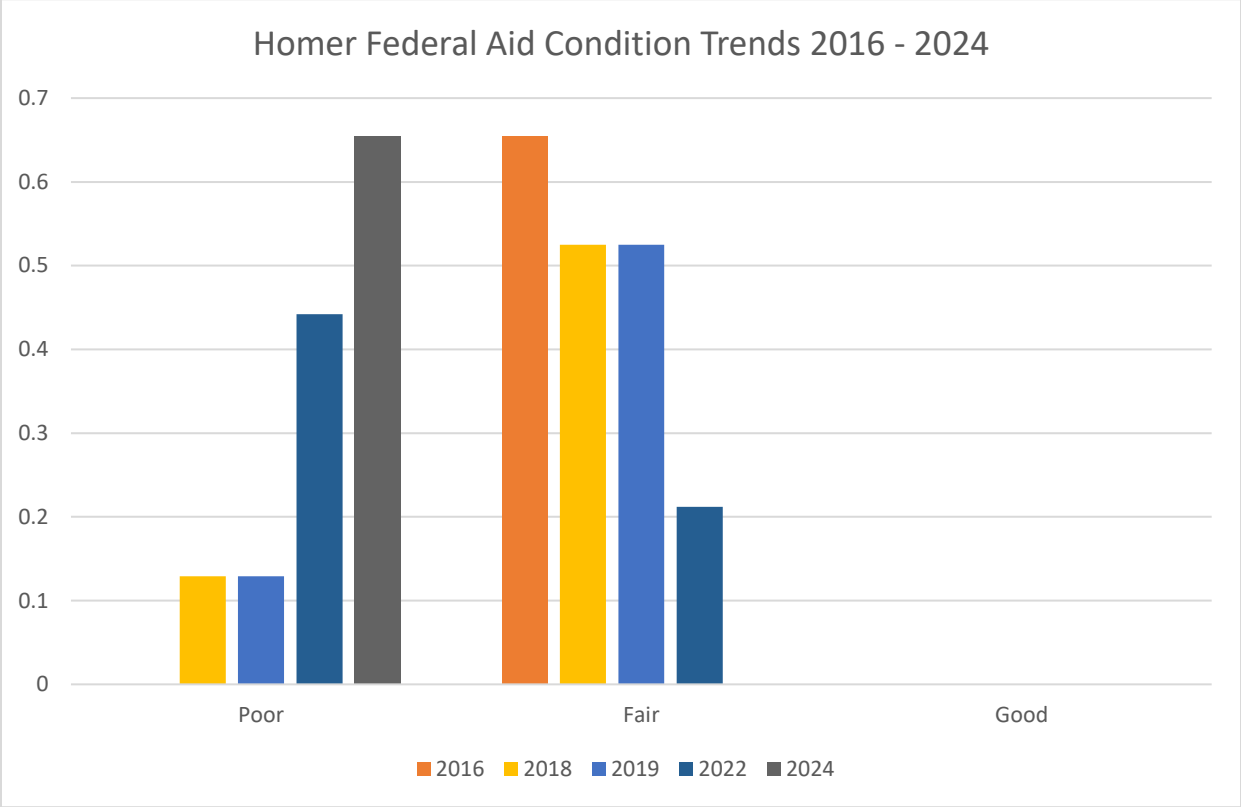

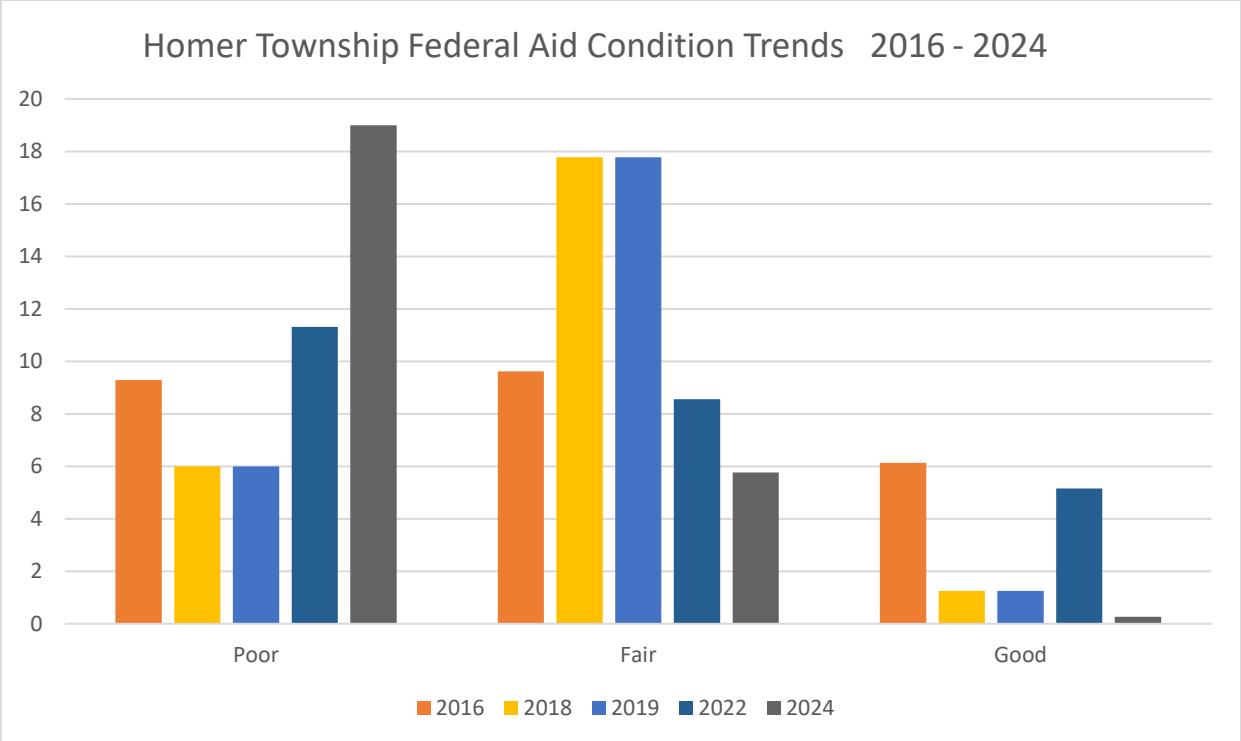

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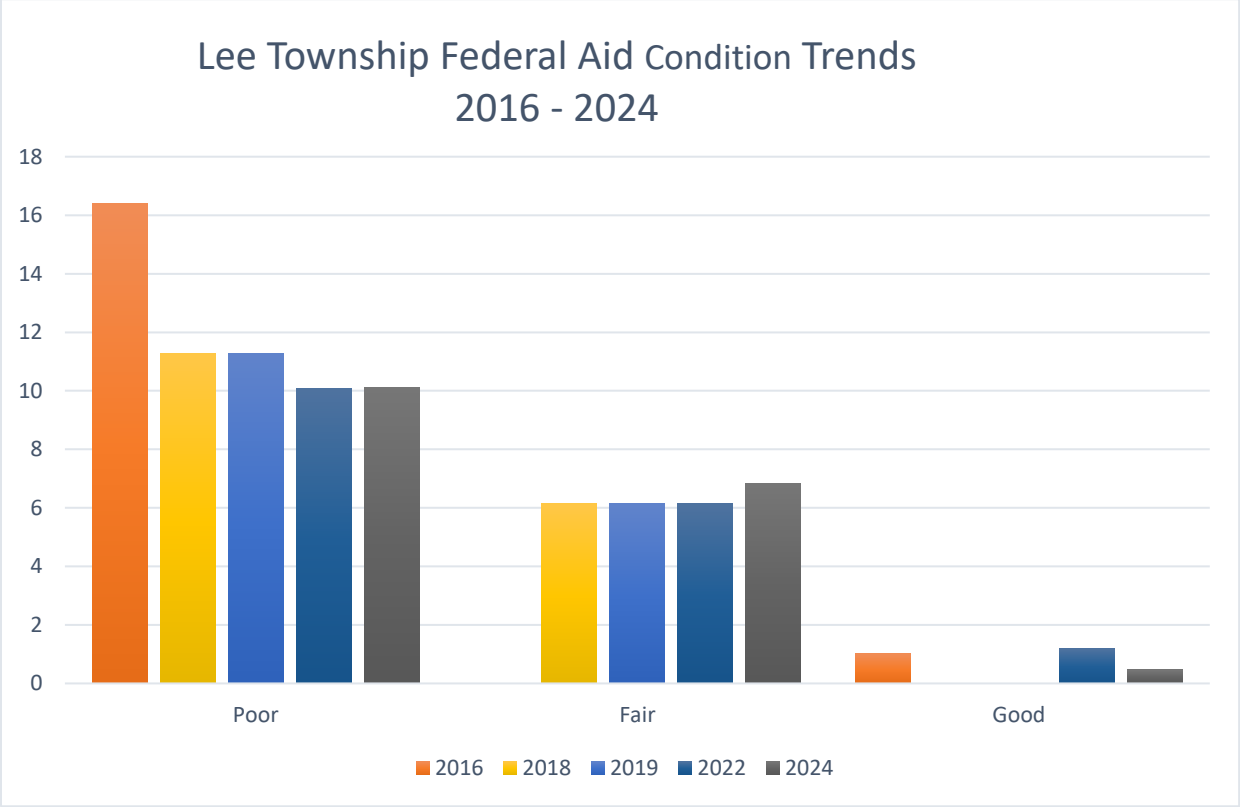

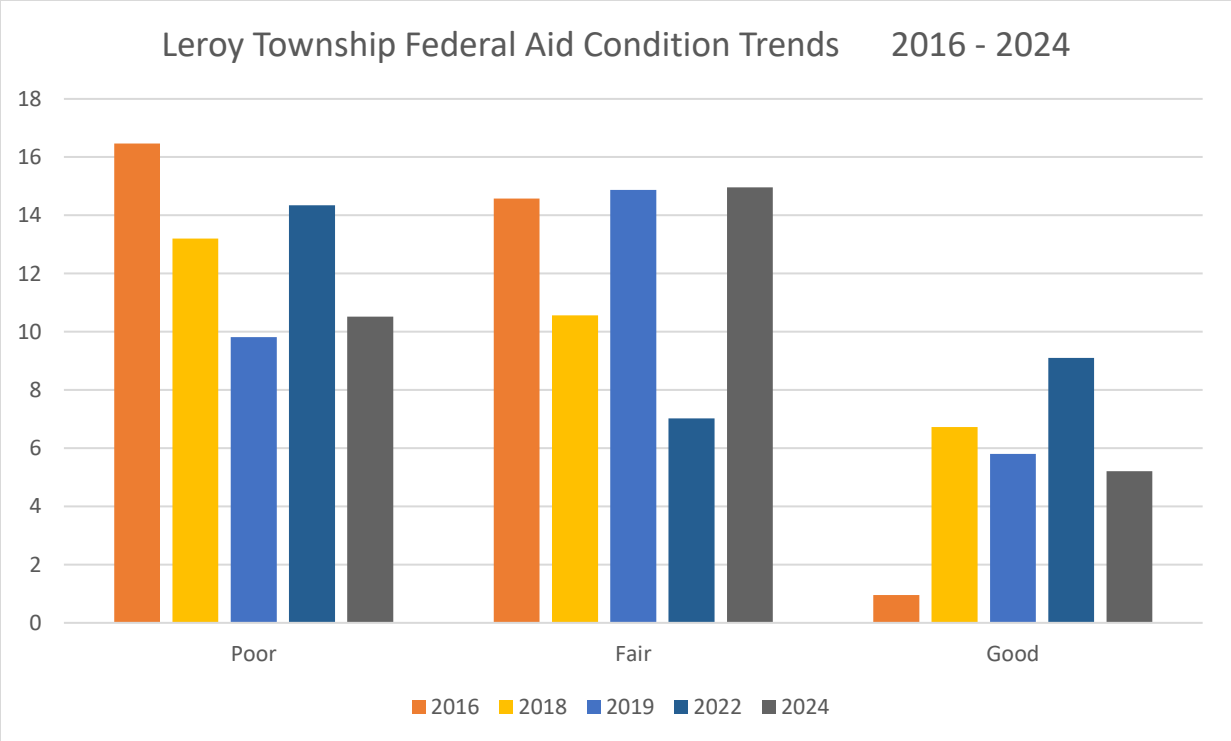

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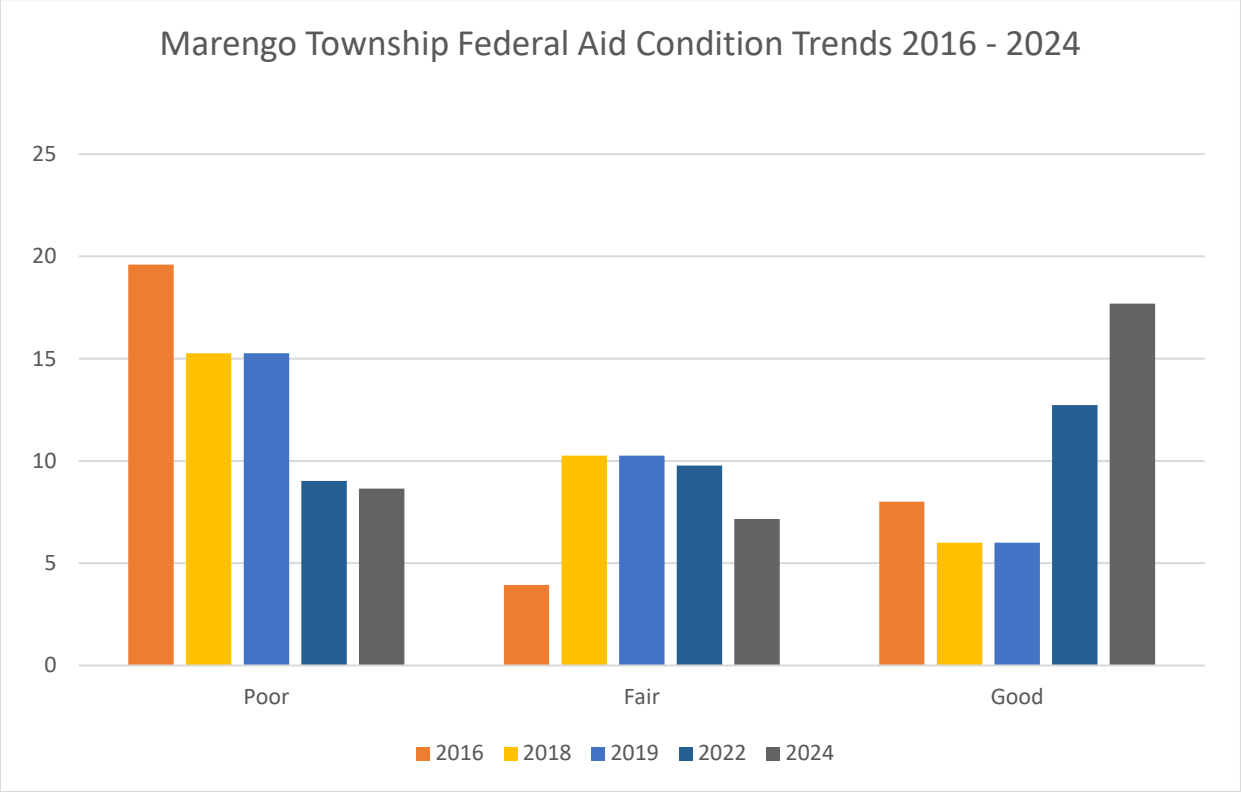

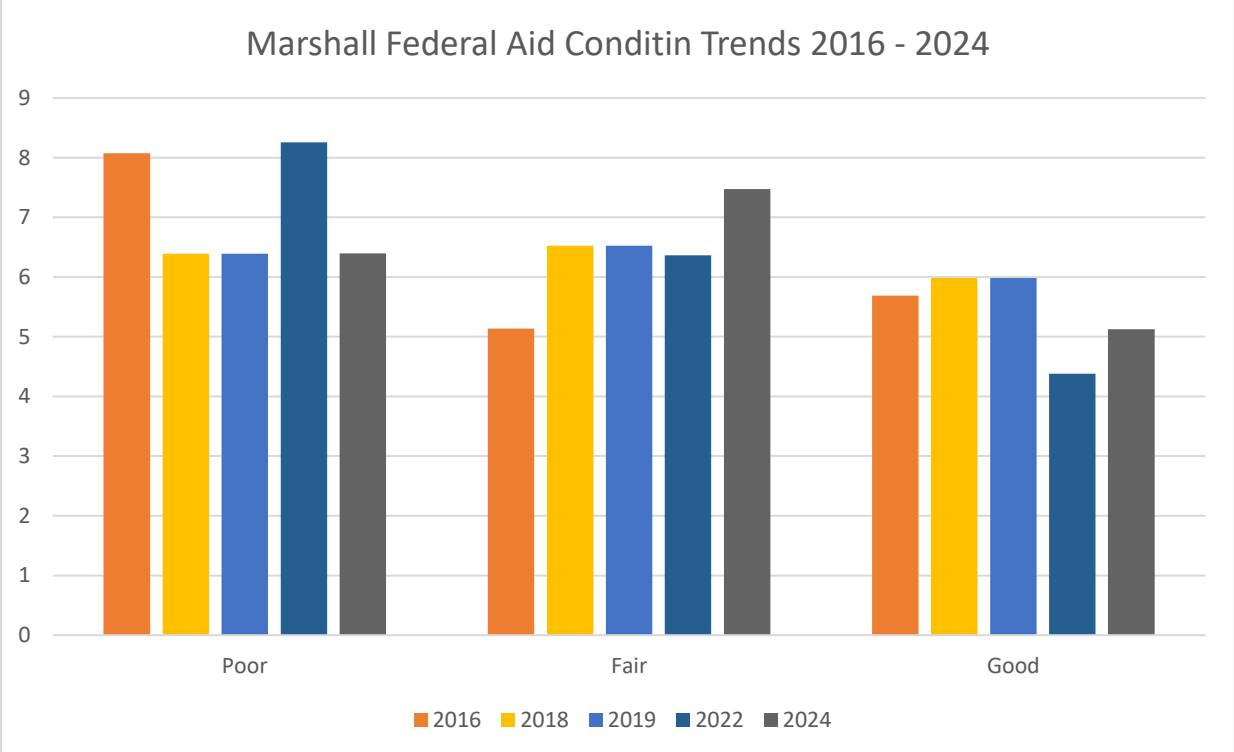

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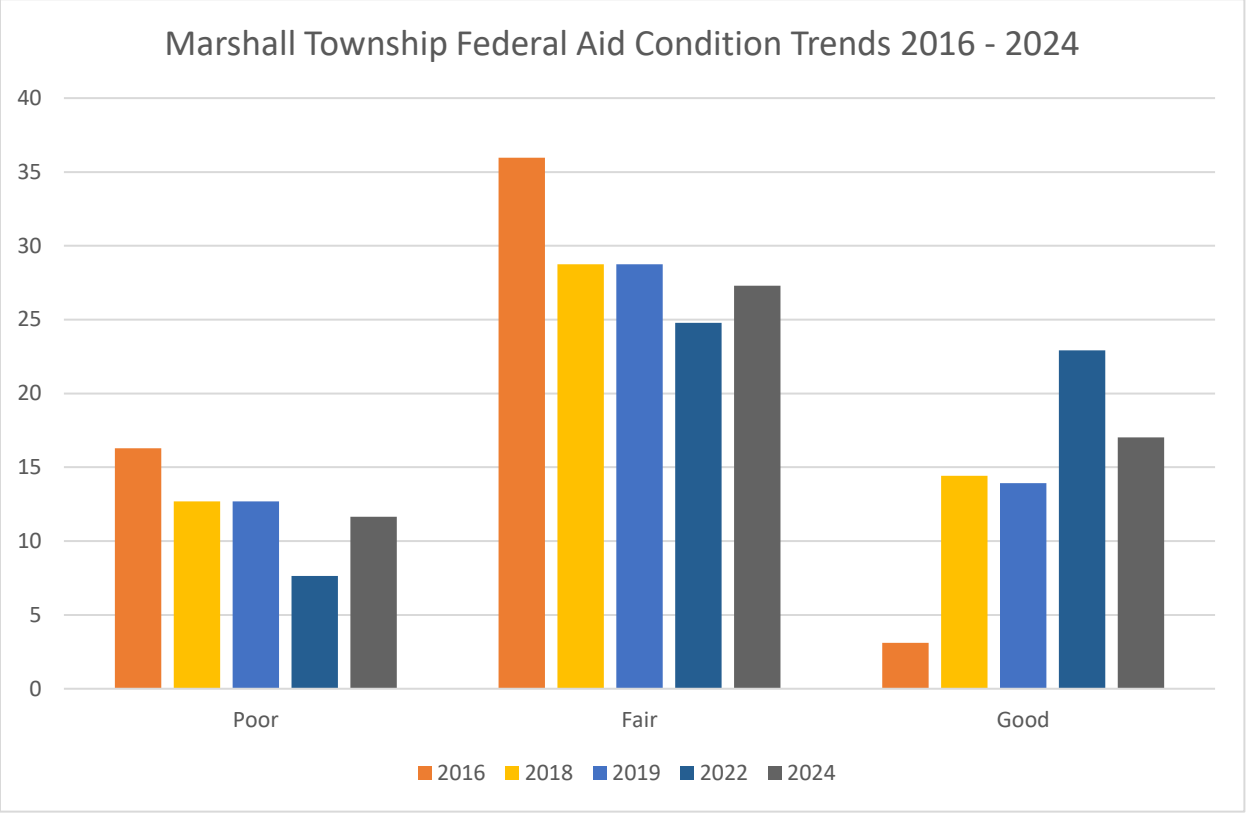

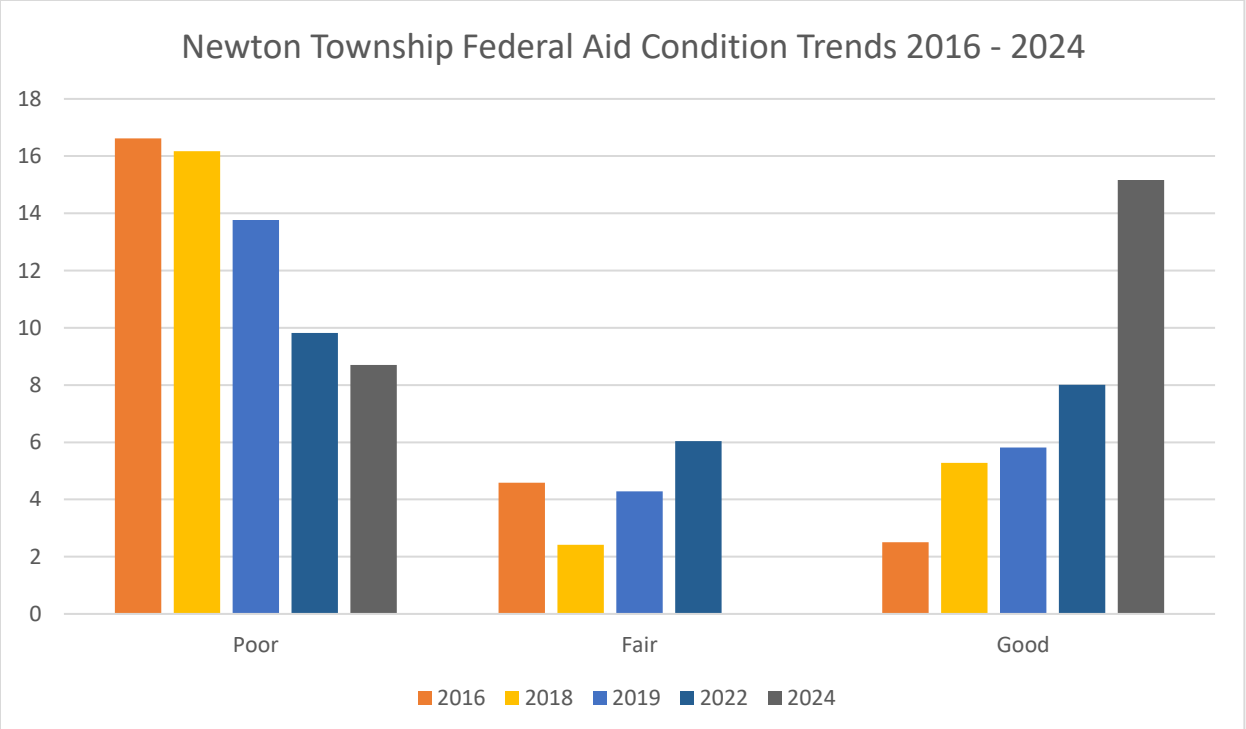

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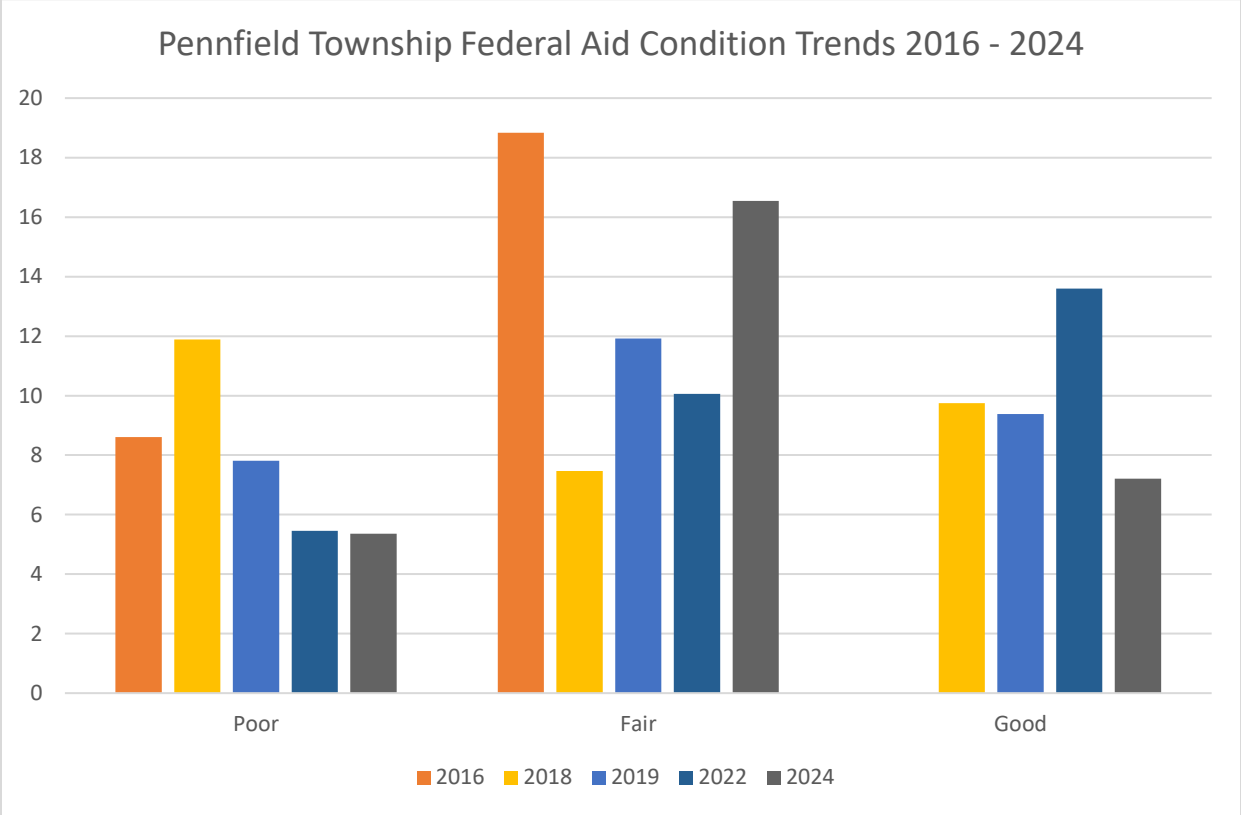
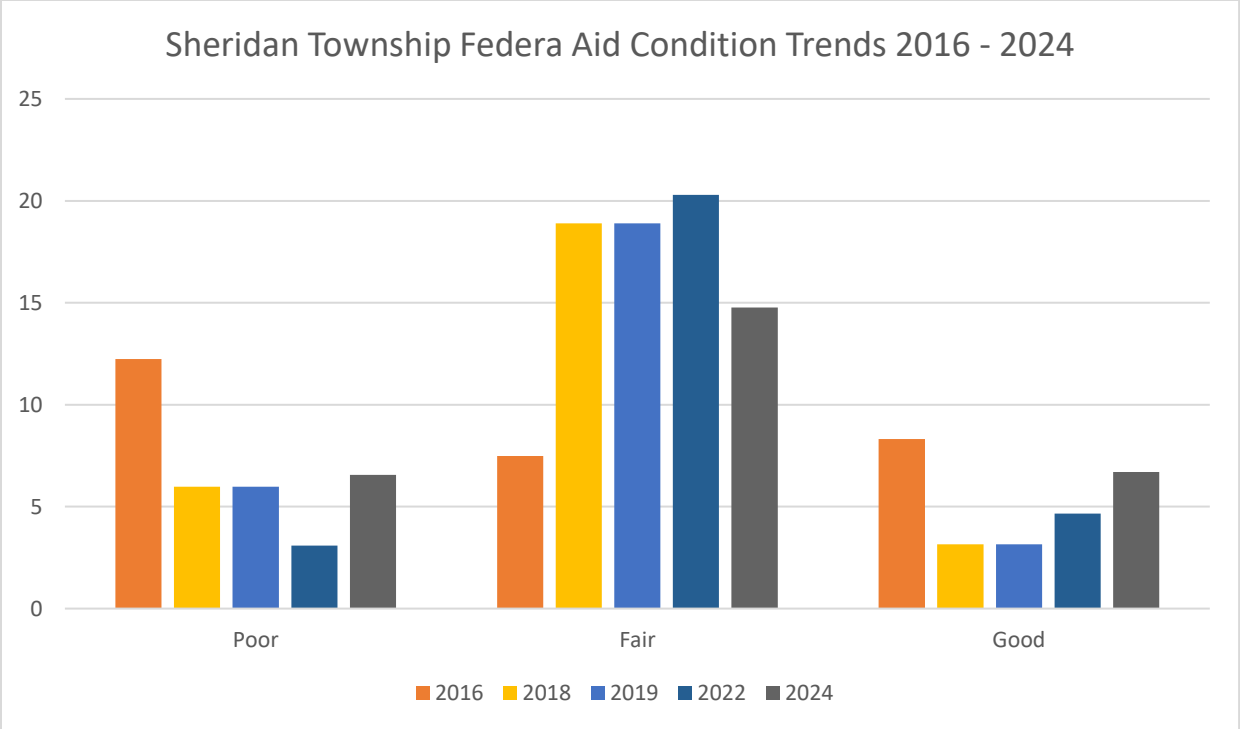
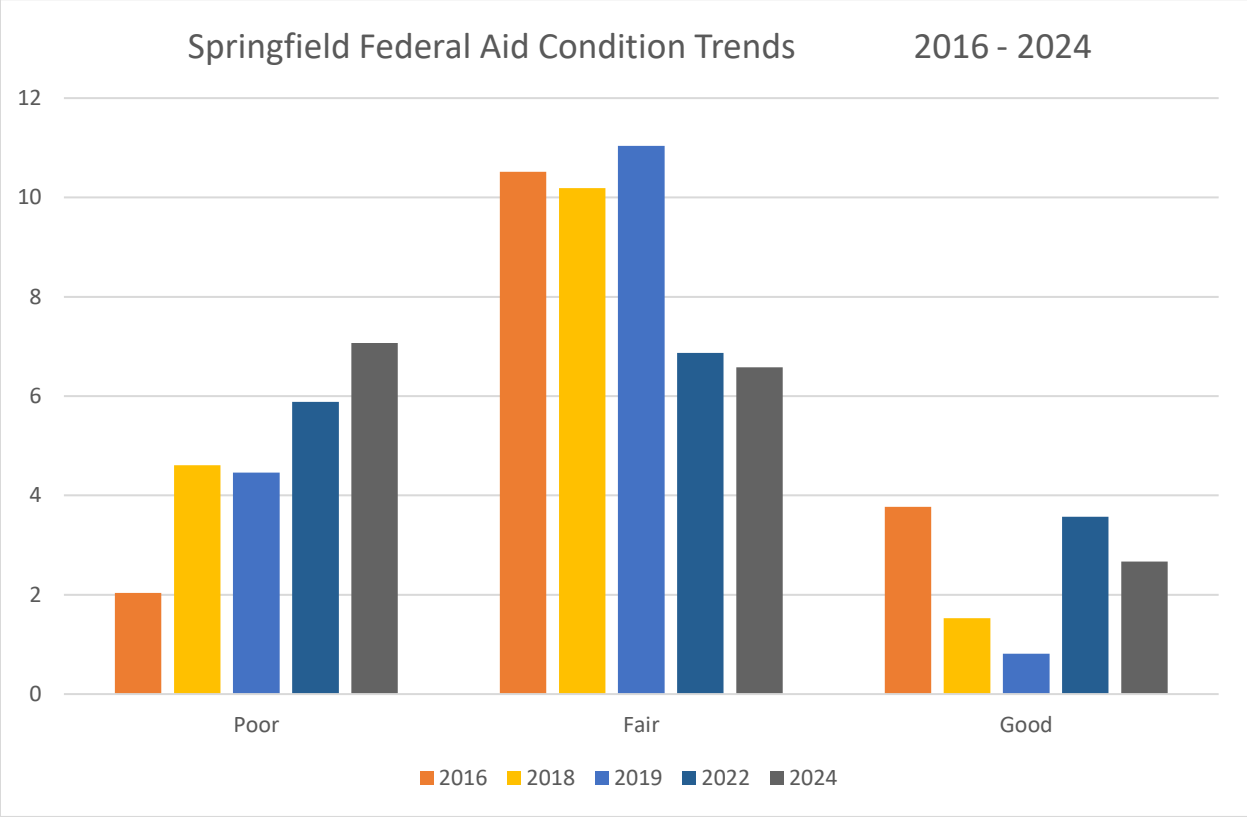
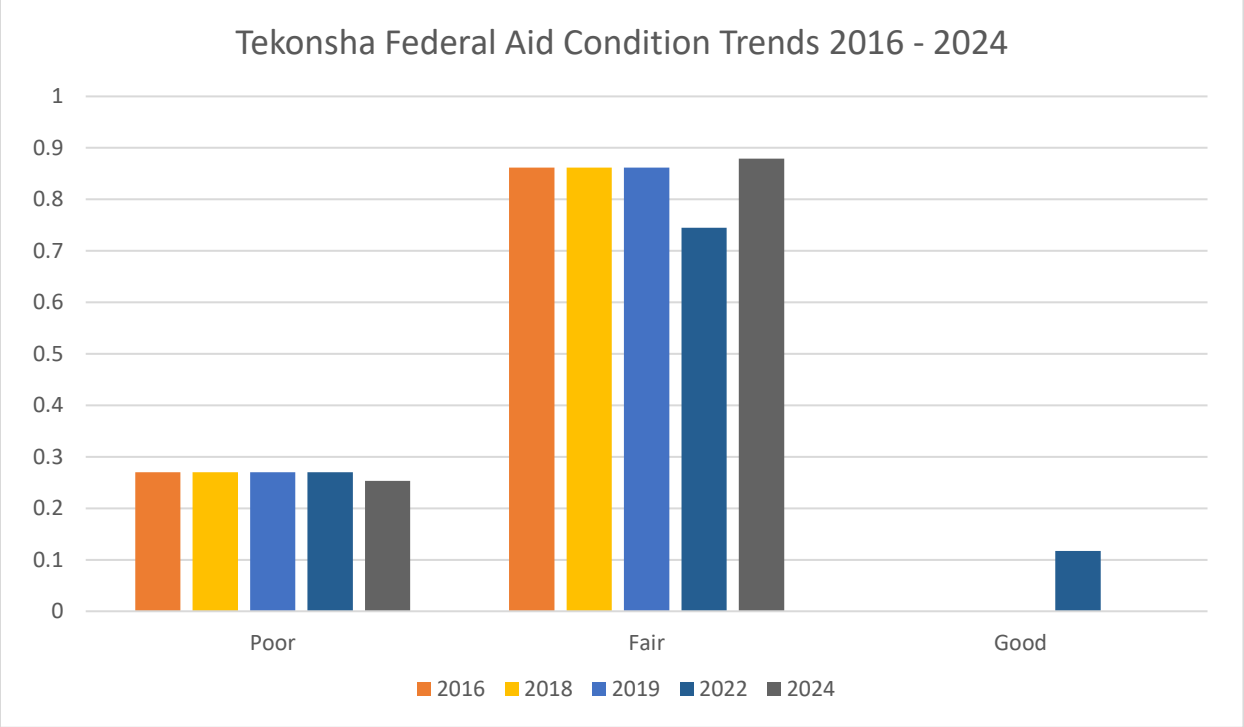


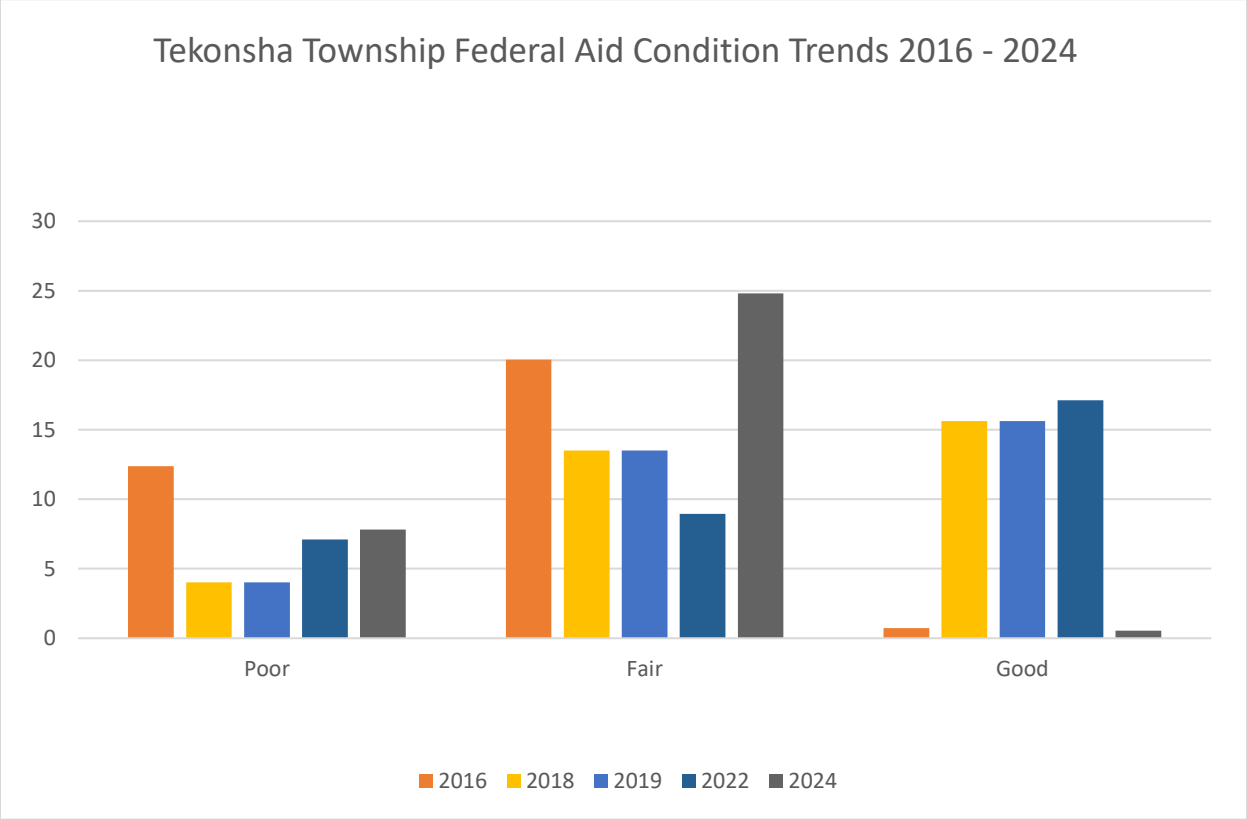


Federal Aid Road Condition Trends





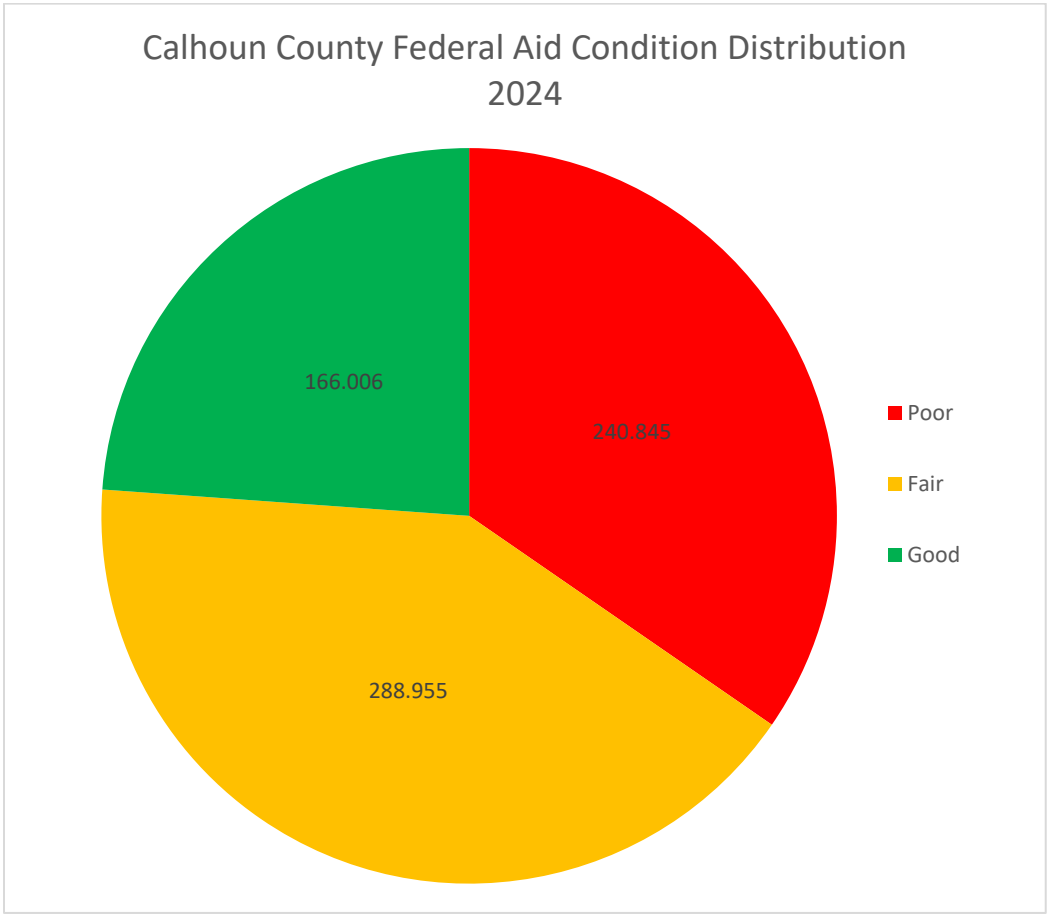
Federal Aid Road Condition Trends



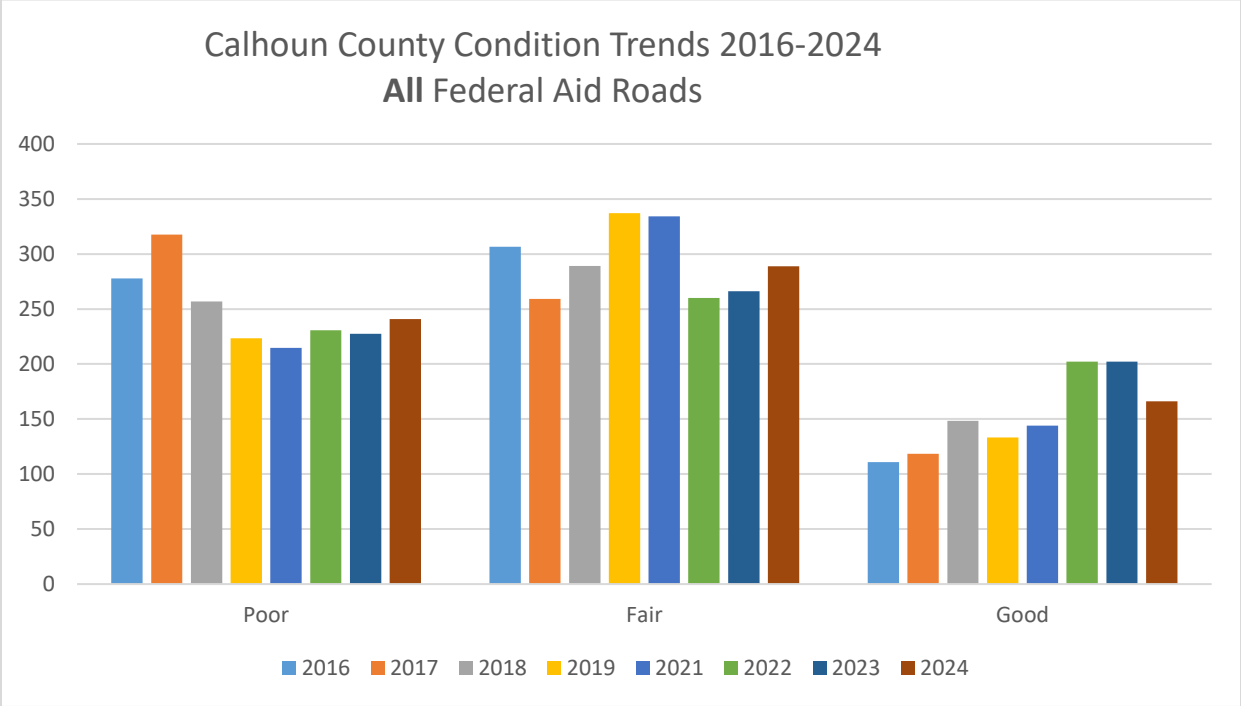
ROAD CONDITION REPORT FOR CALHOUN COUNTY

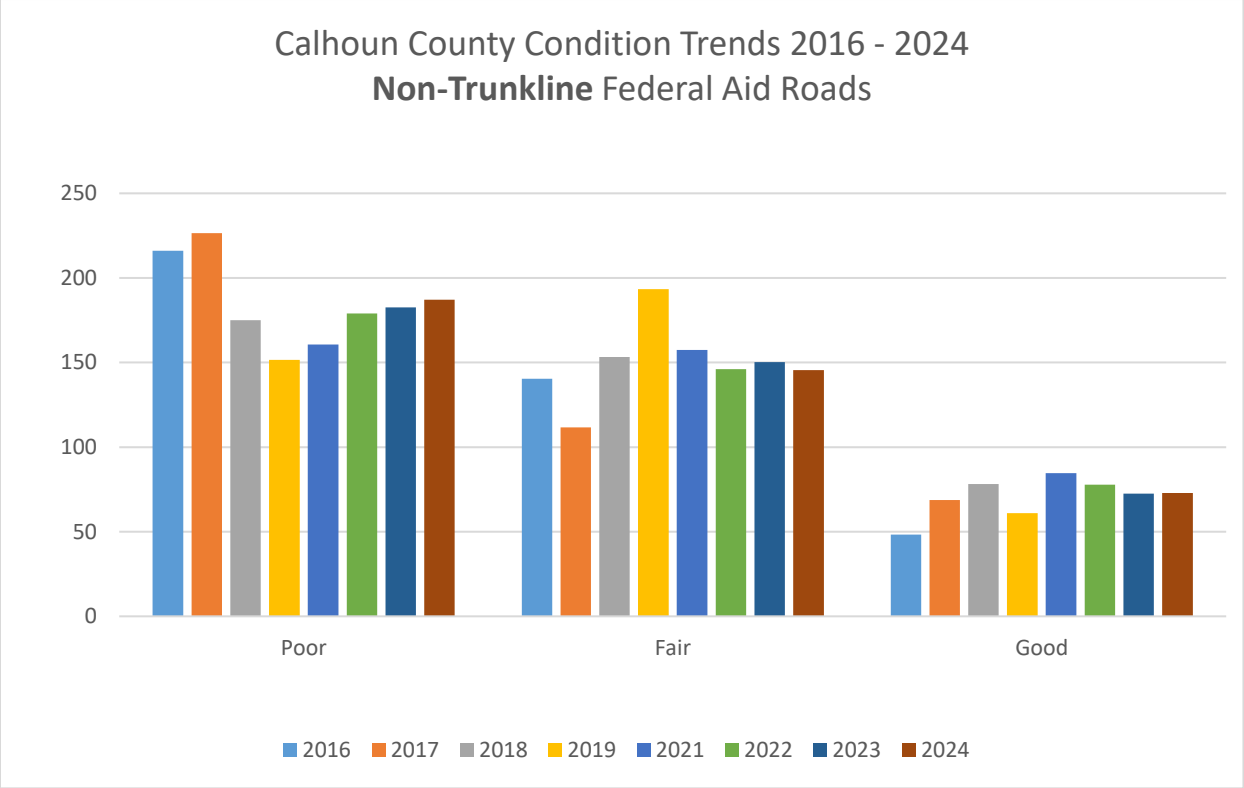
Pavement Condition Summary

Of the 696 miles of federal-aid roads that were rated in 2023-2024, approximately 241 miles are rated as being in "Poor" condition, 289 miles rated "Fair", and 166 miles "Good". Slightly over one third of federal aid roads in the county are rated poor and under one quarter good.

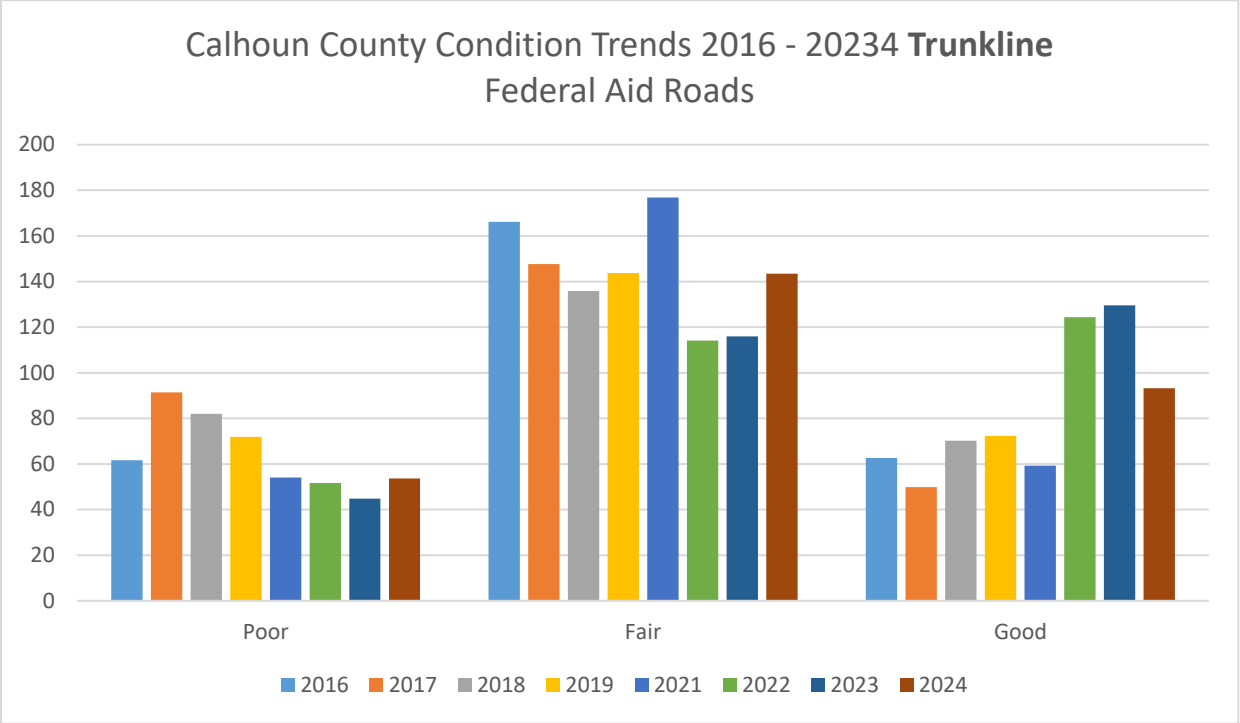


Condition Trends of Federal Aid Roads





ROAD CONDITION REPORT FOR CALHOUN COUNTY

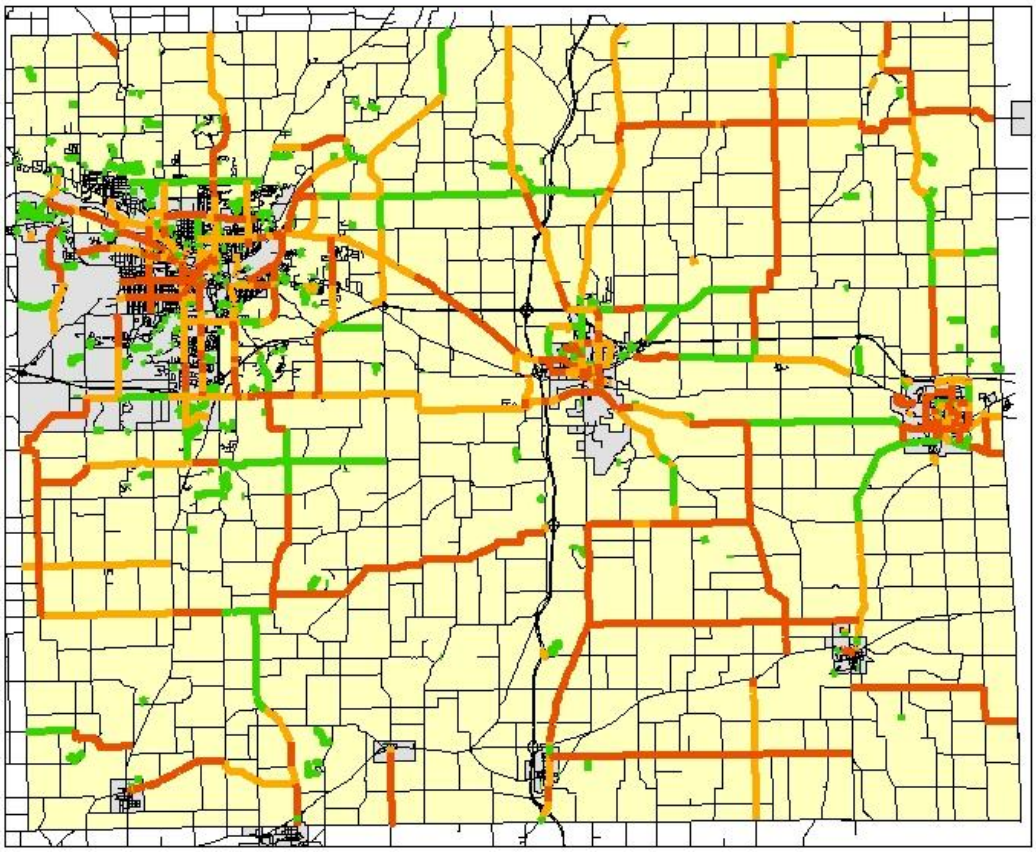


The bar graphs shown above illustrate quantities of each PASER condition category of federal aid roads in Calhoun County as recorded over the course of seven years. After making strides to improve trunkline road conditions in Calhoun County in previous years there was an increase in poor and fair rated mileage accompanied by a significant drop in good. Local agencies over the last four rating years have begun to reverse the previous trend increasing fair and good mileage while reducing poor. It is important that they increase their efforts in applying preventative maintenance measures to ensure the continued preservation of Fair rated roads before they deteriorate to Poor.

The maps on the following pages show the location and condition of federal aid roads in Calhoun County.

Road Condition Maps

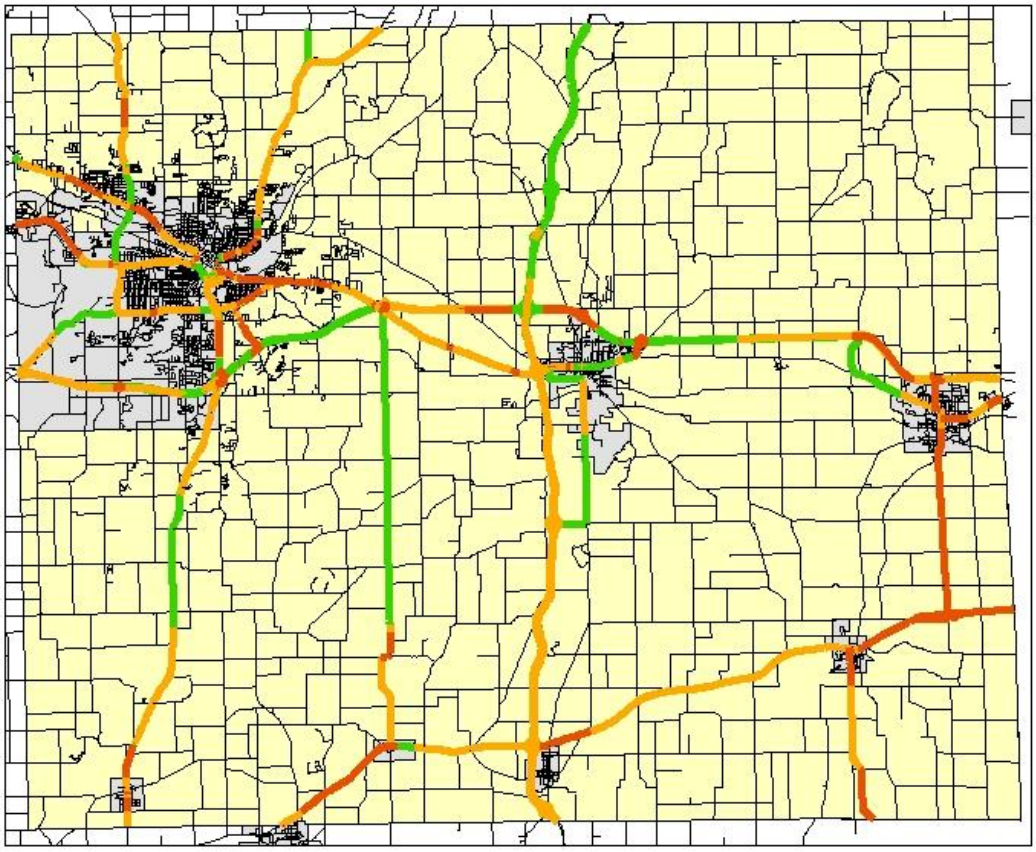
Calhoun County Non-Trunkline Federal Aid Road Conditions 2024



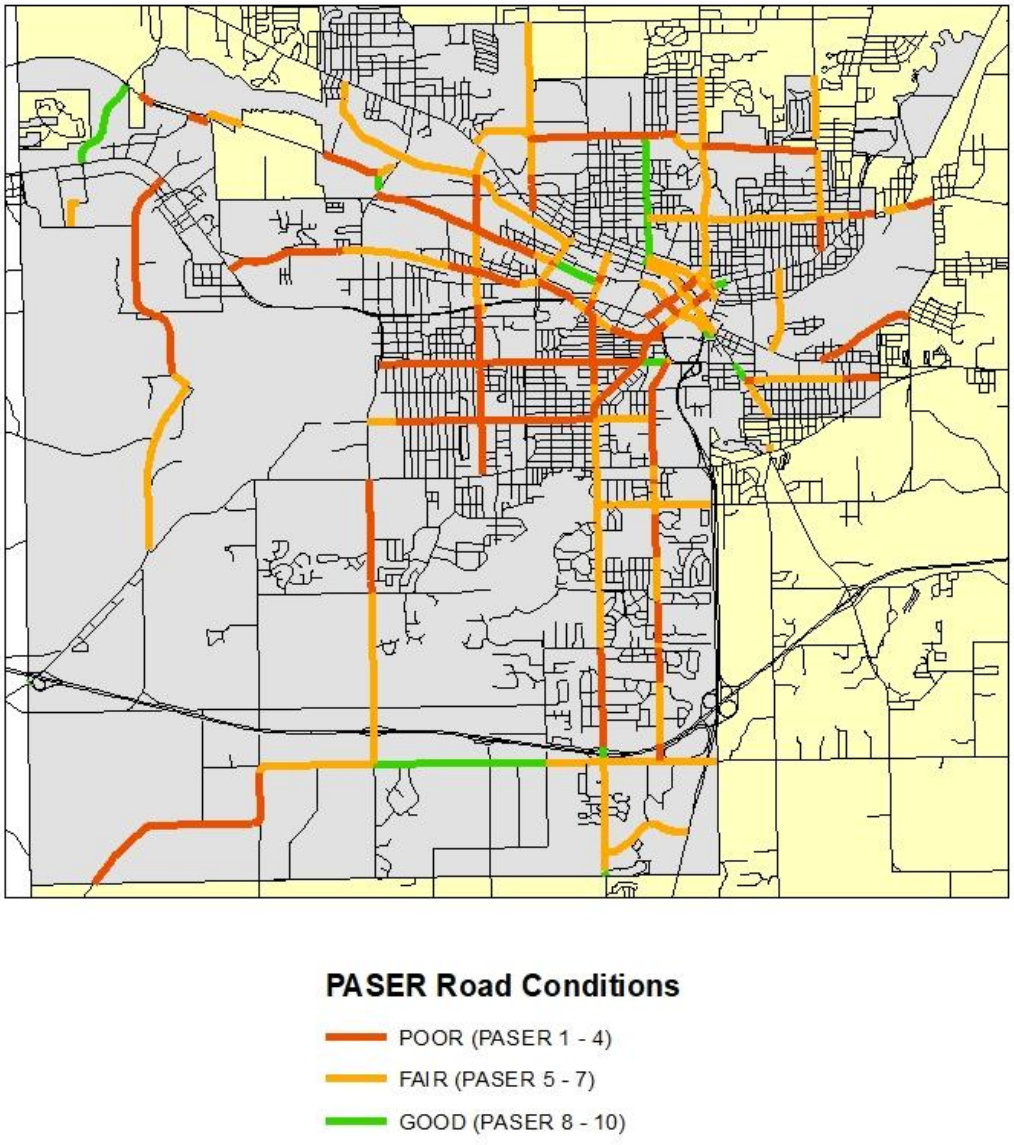
PASER Road Conditions

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

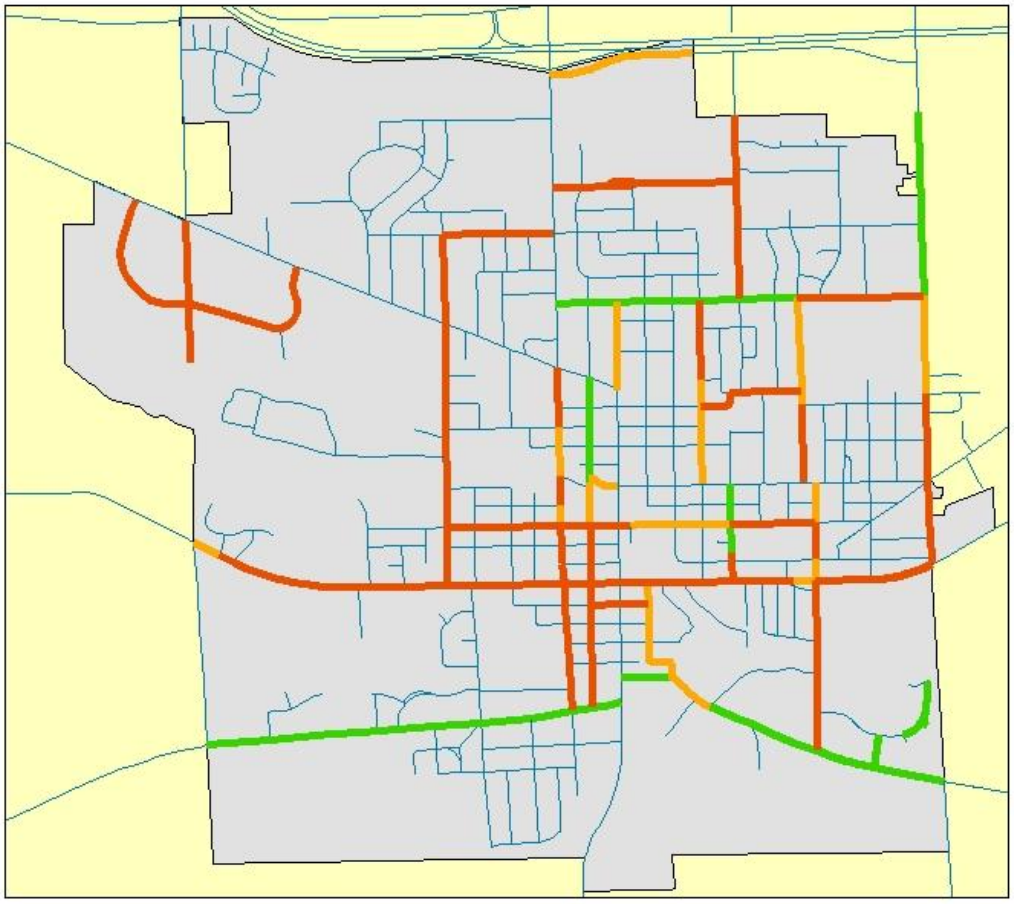
Calhoun County Trunkline Federal Aid Road Conditions 2024



Battle Creek/Springfield Non-Trunklline Federal Aid Road Conditions 2024



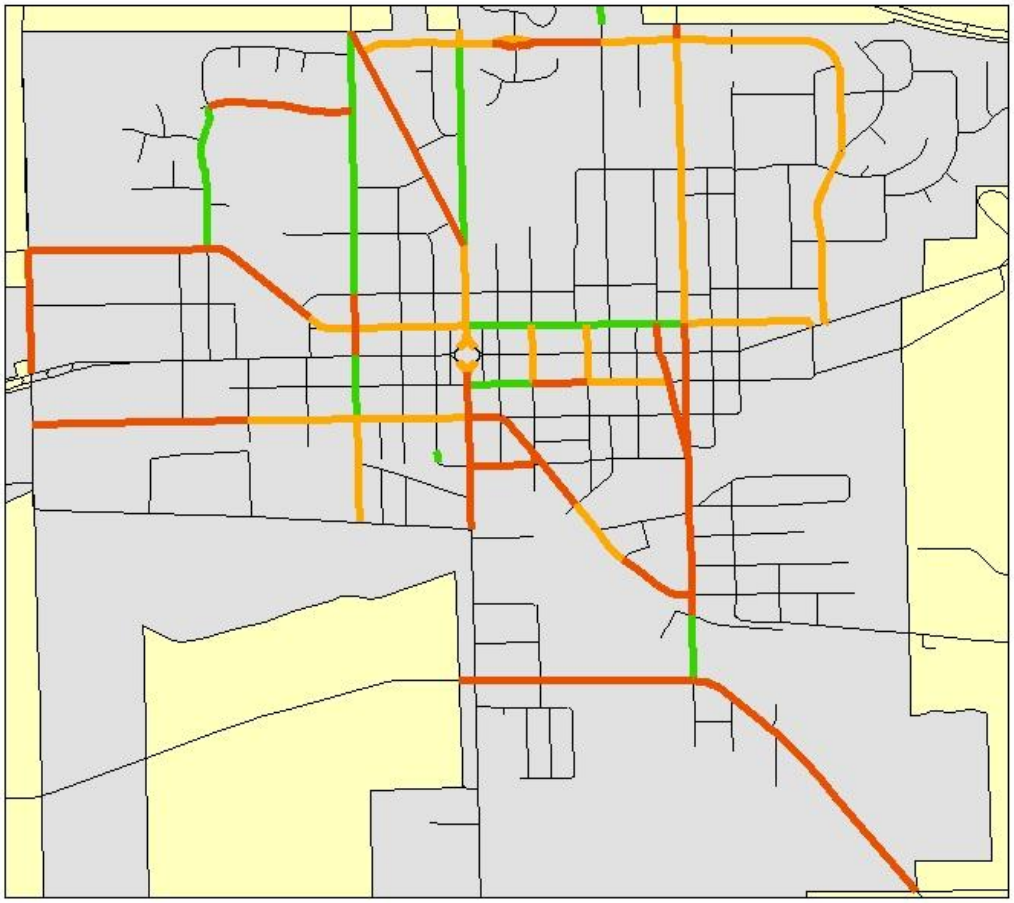
City of Albion Non-Trunkline
Federal Aid Road Conditions
2024



PASER Road Conditions

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

Marshall Non-Trunklline
Federal Aid Road Conditions
2024



PASER Road Conditions

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

Contact Information

For more information regarding the Calhoun 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

- **Calhoun County Road Department**
  13300 15 Mile Road • Marshall, Michigan • 49068
  (269) 781-9841