St Joseph County Road Commission
2026 Transportation Asset Management Plan

A plan describing the St Joseph County Road Commission’s transportation assets and conditions

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EXECUTIVE SUMMARY

As conduits for commerce and connections to vital services, roads and bridges are some of the most important assets in any community, and other assets like culverts, traffic signs, traffic signals, and utilities support and affect roads and bridges. The St Joseph County Road Commission's (SJCRC) roads, bridges, and support systems are also some of the most valuable and extensive public assets, all of which are paid for with taxes collected from ordinary citizens and businesses. The cost of building and maintaining these assets, their importance to society, and the investment made by taxpayers all place a high level of responsibility on local agencies to plan, build, and maintain roads, bridges, and support assets in an efficient and effective manner. This asset management plan is intended to report on how SJCRC is meeting its obligations to maintain the public assets for which it is responsible.

This plan identifies SJCRC's assets and condition and how SJCRC maintains and plans to improve the overall condition of those assets. An asset management plan is required by Michigan Public Act 325 of 2018, and this document represents fulfillment of some of SJCRC's obligations towards meeting these requirements. However, this plan and its supporting documents are intended to be much more than a fulfillment of required reporting. This asset management plan helps to demonstrate SJCRC's responsible use of public funds by providing elected and appointed officials as well as the general public with the inventory and condition information of SJCRC's assets, and it gives taxpayers the information they need to make informed decisions about investing in SJCRC's essential transportation infrastructure.

INTRODUCTION

Asset management is defined by Public Act 325 of 2018 as “an ongoing process of maintaining, preserving, upgrading, and operating physical assets cost effectively, based on a continuous physical inventory and condition assessment and investment to achieve established performance goals”. In other words, asset management is a process that uses data to manage and track assets, like roads and bridges, in a cost-effective manner using a combination of engineering and business principles. This process is endorsed by leaders in municipal planning and transportation infrastructure, including the Michigan Municipal League, County Road Association of Michigan, the Michigan Department of Transportation (MDOT), and the Federal Highway Administration (FHWA). The St Joseph County Road Commission is supported in its use of asset management principles and processes by the Michigan Transportation Asset Management Council (TAMC), formed by the State of Michigan.

Asset management, in the context of this plan, ensures that public funds are spent as effectively as possible to maximize the condition of the road and bridge network. Asset management also provides a transparent decision-making process that allows the public to understand the technical and financial challenges of managing transportation infrastructure with a limited budget.

The St Joseph County Road Commission (SJCRC) has adopted an “asset management” business process to overcome the challenges presented by having limited financial, staffing, and other resources while needing to meet road users’ expectations. SJCRC is responsible for maintaining and operating over 1020.354 centerline miles of roads and 102 bridge structures. It is also responsible for 2,000 culverts and 0 signals.

This 2026 plan identifies SJCRC’s transportation assets and their condition as well as the strategy that SJCRC uses to maintain and upgrade particular assets given SJCRC’s condition goals, priorities of network’s road users, and resources. An updated plan is to be released approximately every three years both to comply with Public Act 325 and to reflect changes in road conditions, finances, and priorities.

Questions regarding the use or content of this plan should be directed to Garrett Myland at 20914 M-86, Centreville, MI, 49032or at (269)-467-6393 and/or gmyland@sjcrc.com.A copy of this plan can be accessed on our website at stjoeroads.com.

1. PAVEMENT ASSETS

SJCRC is responsible for 1020.354 centerline miles of public roads. An inventory of these miles divides them into different network classes based on road purpose/use and funding priorities as identified at the state level: county primary road network, which is prioritized for state-level funding, and county local road network.

Inventory of Assets

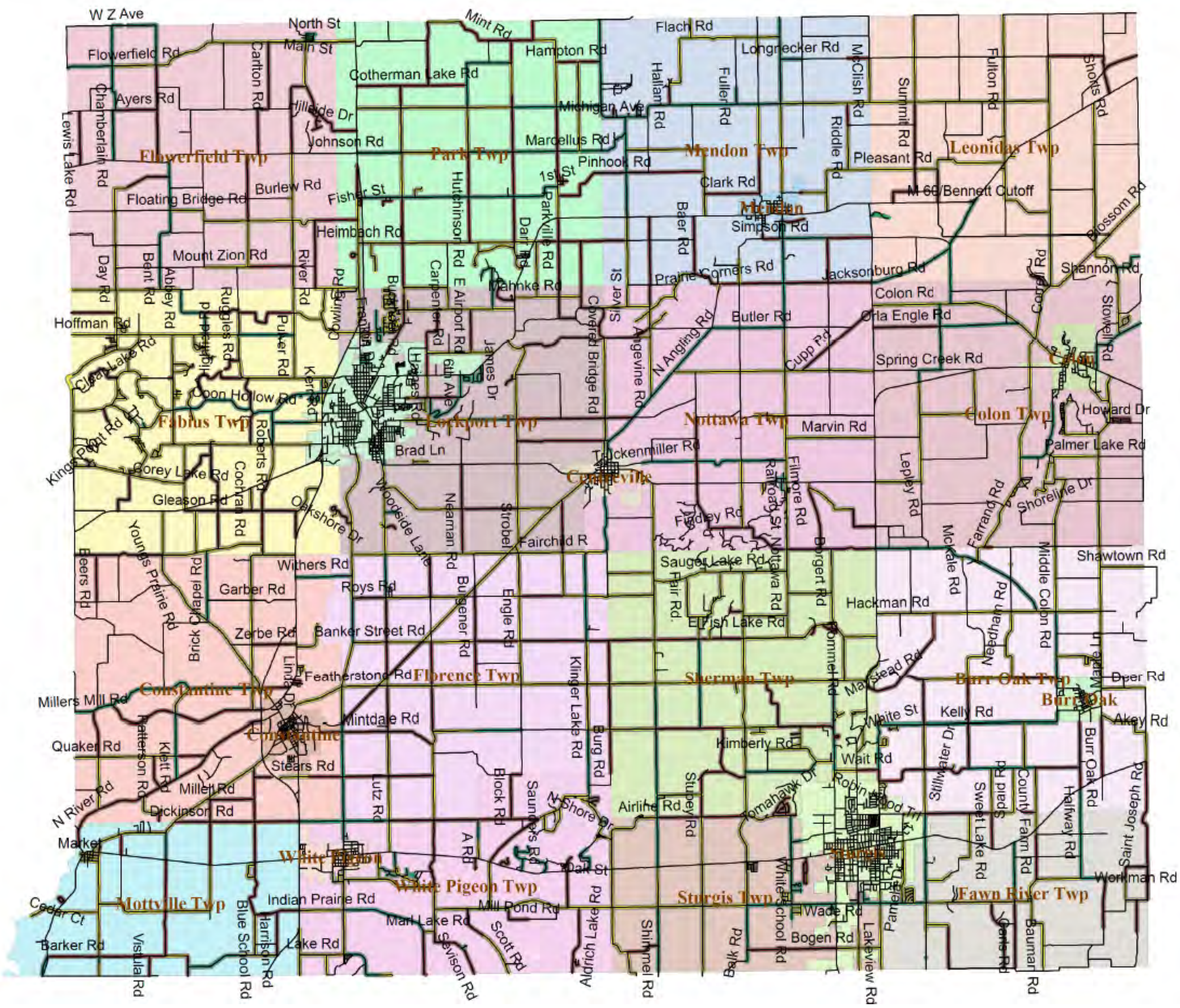

Figure 1: Map showing location or roads managed by SJCRC and the current condition for paved roads in green for good (PASER 10, 9, 8), yellow for fair (PASER 7, 6, 5), and red for poor (PASER 4, 3, 2, 1) and for unpaved roads in blue

Of SJCRC's 1020.354 miles of road, 328.42 miles are classified as county primary and 691.934 miles are classified as county local (Figure 1identifies these paved roads in green, yellow, and red with the colors being determined based on the road segment's condition). SJCRC also manages 0 miles that are classified as part of the National Highway System (NHS); the NHS is subject to special rules and regulations and

has its own performance metrics dictated by the FHWA. In addition, SJCRC has 194.257 miles of unpaved roads (Figure 1 identifies these unpaved roads in blue).

More detail about these road assets can be found in SJCRC's Roadsoft database or by contacting SJCRC.

Types

SJCRC has multiple types of pavements in its jurisdiction, including asphalt, sealcoat, concrete, and undefined; it also has unpaved roads (i.e, gravel and/or earth). Figure 2 shows a breakdown of these pavement types for all of SJCRC's road assets.

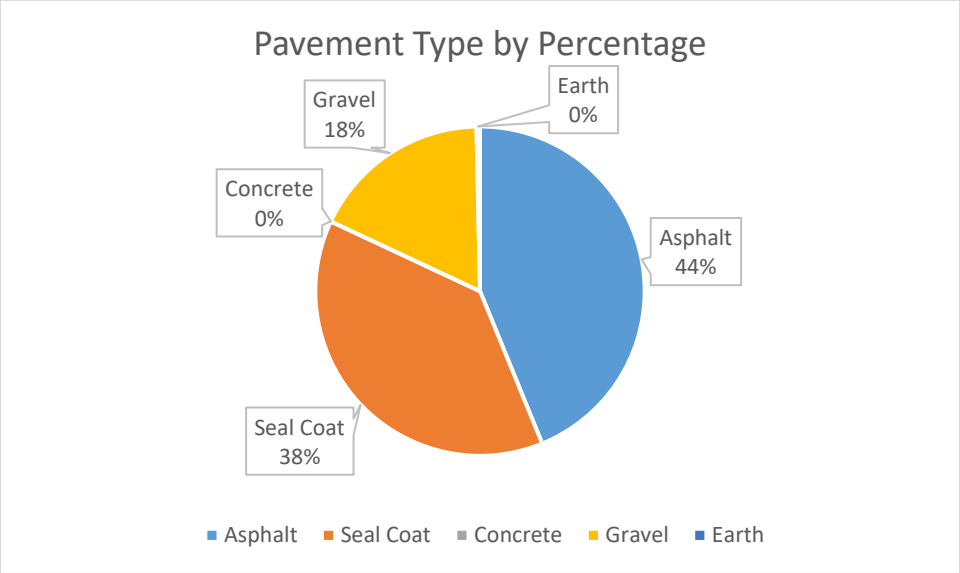

Figure 2: Pavement type by percentage maintained by SJCRC. Undefined pavements have not been inventoried in SJCRC's asset management system to date, but will be included as data becomes available.

Condition, Goals, and Trend

Paved Roads

Paved roads in Michigan are rated using the Pavement Surface Evaluation and Rating (PASER) system, which is a 1 to 10 scale with 10 being a newly constructed surface and 1 being a completely failed surface. PASER scores are grouped into TAMC definition categories of good (8-10), fair (5-7), and poor (1-4) categories. SJCRC collects PASER data every two years on 100 percent of those portions of its county primary and county local networks that are eligible for federal funding. In addition, SJCRC uses its own staff and resources to collect PASER data on 50 percent of its county primary and county local networks that are not eligible for federal funding.

Currently, the county primary network has 24.1% of its roads in good condition, 64.6% in fair condition, and 11.3% in poor condition, and the county local network has 14.3% of its roads in good condition, 43.9% in fair condition, and 41.7% in poor condition (Figure 3 and Figure 4). SJCRC's long-range goal for the county primary network is to have 25% of roads in good condition,50% in fair condition, and 25% in poor condition, and for the county local network is to have 30% of roads in good condition, 40% in fair condition, and 30% in poor condition (Figure 3 and Figure 4). Figure 3 and Figure 4 illustrate the historical and current condition (solid bars) of SJCRC's county primary and county local networks, respectively; they also illustrate the projected trend (shaded bars), the overall trend in condition (trendlines), and SJCRC's goal (final solid bar).

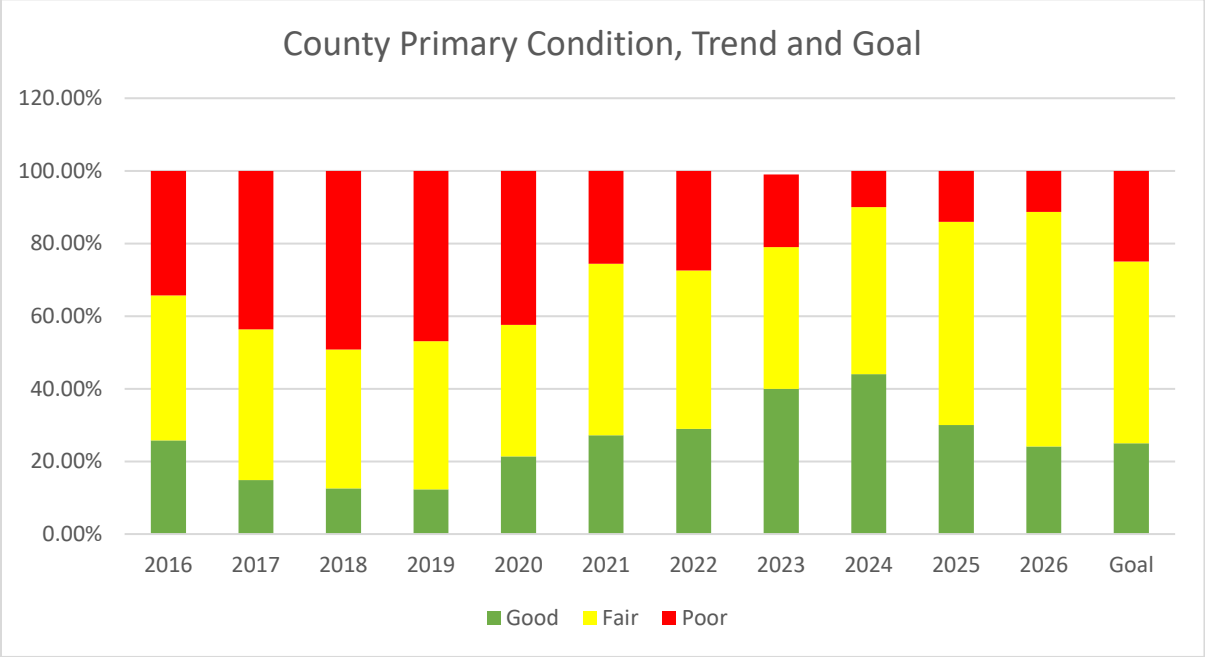

Figure 3: county primary network condition, goals, and trend

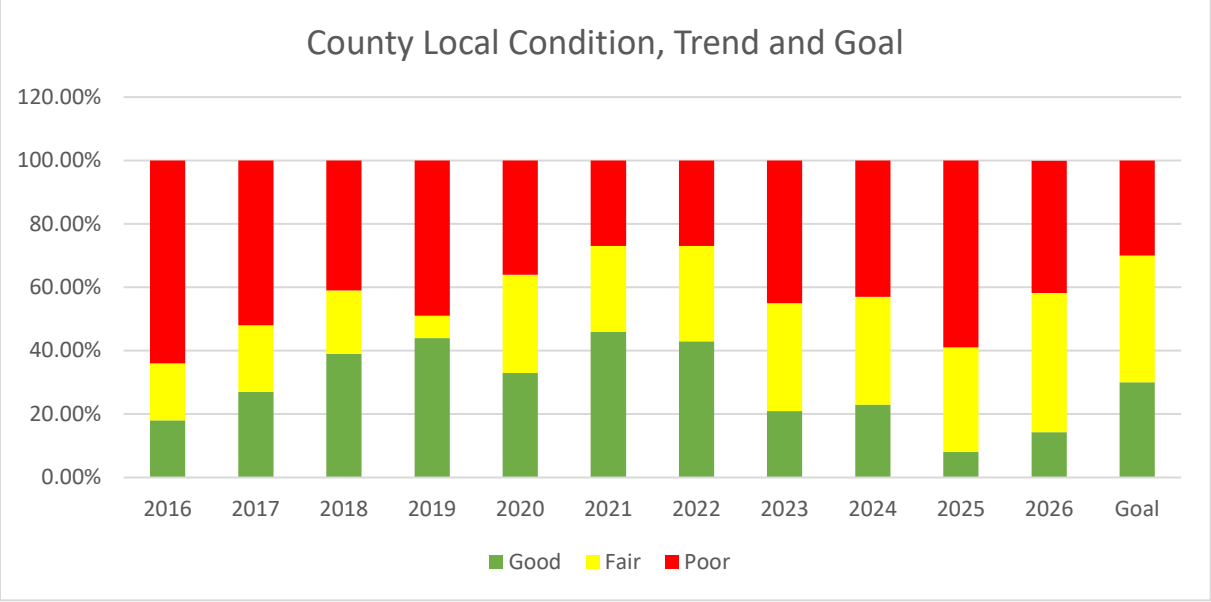

Figure 4: county local network condition, goals, and trend

Unpaved Roads

Unpaved roads rated with the Inventory-based Rating System™ receive an IBR number ranging from 1 to 10, with a 9 or 10 (less than one year old) having good surface width, good or fair drainage, and good structural adequacy and a 1 having poor surface width, poor drainage, and poor structural adequacy. IBR numbers can be grouped in a similar fashion as the TAMC definitions into good (8-10), fair (5-7), and poor (1-4) categories. Figure 5 illustrates the historical and/or current condition (solid bar[s]), the projected trend (shaded bars), and SJCRC's goal (final solid bar).

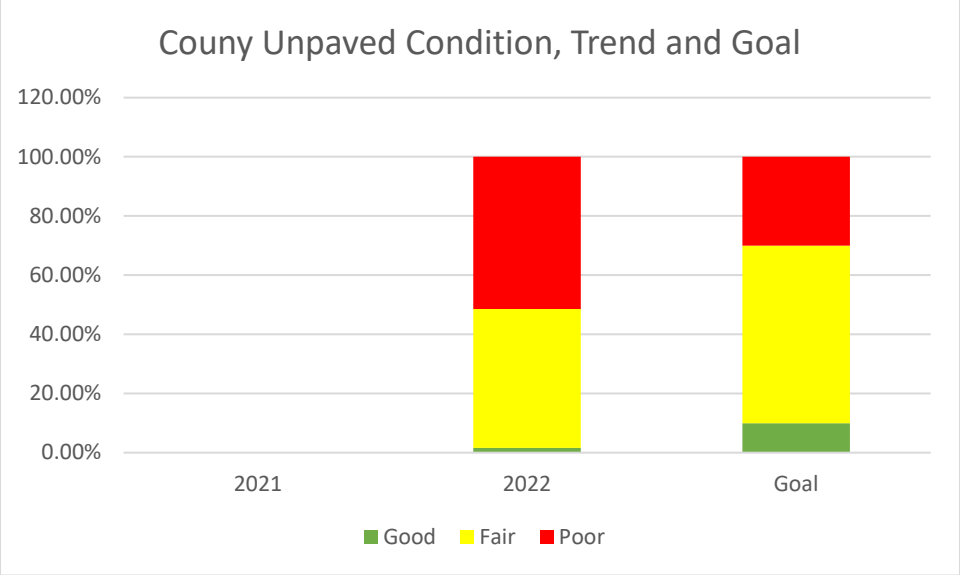

Figure 5: Distribution of IBR numbers for current condition (solid) and for goals (dotted)

Modelled Trends, Gap Analysis, and Planned Projects

Table 1: Roadsoft Modelled Trends, Planned Projects, and Gap Analysis for Road Assets

Network 1 (<328.42 miles)

Treatment	Annual Miles of Treatment	Years of Life	Trigger-Reset	Pavement Condition Forecast			
				Annual Miles of Treatment	Trigger-Reset	Annual Miles of Treatment	Trigger-Reset
Crack Seal	20	1	7–7	10	7–7		7–7
Chip Seal	55	5	5, 6-8	5	5, 6-8		5, 6-8
Overlay	16	10	3, 4-9	10	3, 4-9		3, 4-9
Reconstruction	2.5	18	1, 2, 3-10	1, 2, 3-10	1, 2, 3-10		1, 2, 3-10
[Treatment 5]							
[Treatment 6]							
[Treatment 7]							
[Treatment 8]							

Network 2 (691.934 miles)

Treatment	Annual Miles of Treatment	Years of Life	Trigger-Reset	Pavement Condition Forecast		Additional Work Necessary to Overcome Deficit	
				Annual Miles of Treatment	Trigger-Reset	Annual Miles of Treatment	Trigger-Reset
Crack Seal	5	1	7–7	5	7–7	10	7–7
Chip Seal	69	5	5, 6-8	69	5, 6-8		5, 6-8
Overlay	6	10	3, 4-9	6	3, 4-9	10	3, 4-9
Reconstruction	1	18	1, 2, 3-10	1	1, 2, 3-10	2	1, 2, 3-10
[Treatment 5]							
[Treatment 6]							
[Treatment 7]							
[Treatment 8]							

Modelled Trends & Gap Analysis

The Roadsoft network analysis of SJCRC's planned projects for the county primary and county local networks from SJCRC's currently-available budget does not allow SJCRC to reach its pavement condition goals given the projects planned for the next three years.

Results from the Roadsoft for the county primary and county local network condition models indicate that the county should be able to achieve its goals if all of the Neighboorhood Road funding comes through.

Unpaved Road Condition Trends

The expected trends on the unpaved road network is most likely to go up. The St. Joseph County Road Commission is consistently working on gravel roads, averaging $7,000 per mile of maintenance put into them. It is the intent of the St. Joseph County Road Commission to start to increase the amount of roads which are regraveled due to the fact that we are able to keep up on a 7 year rotation for sealcoating.

Planned Projects

SJCRC has projects planned for the next three years. These projects are identified in Figure 6.

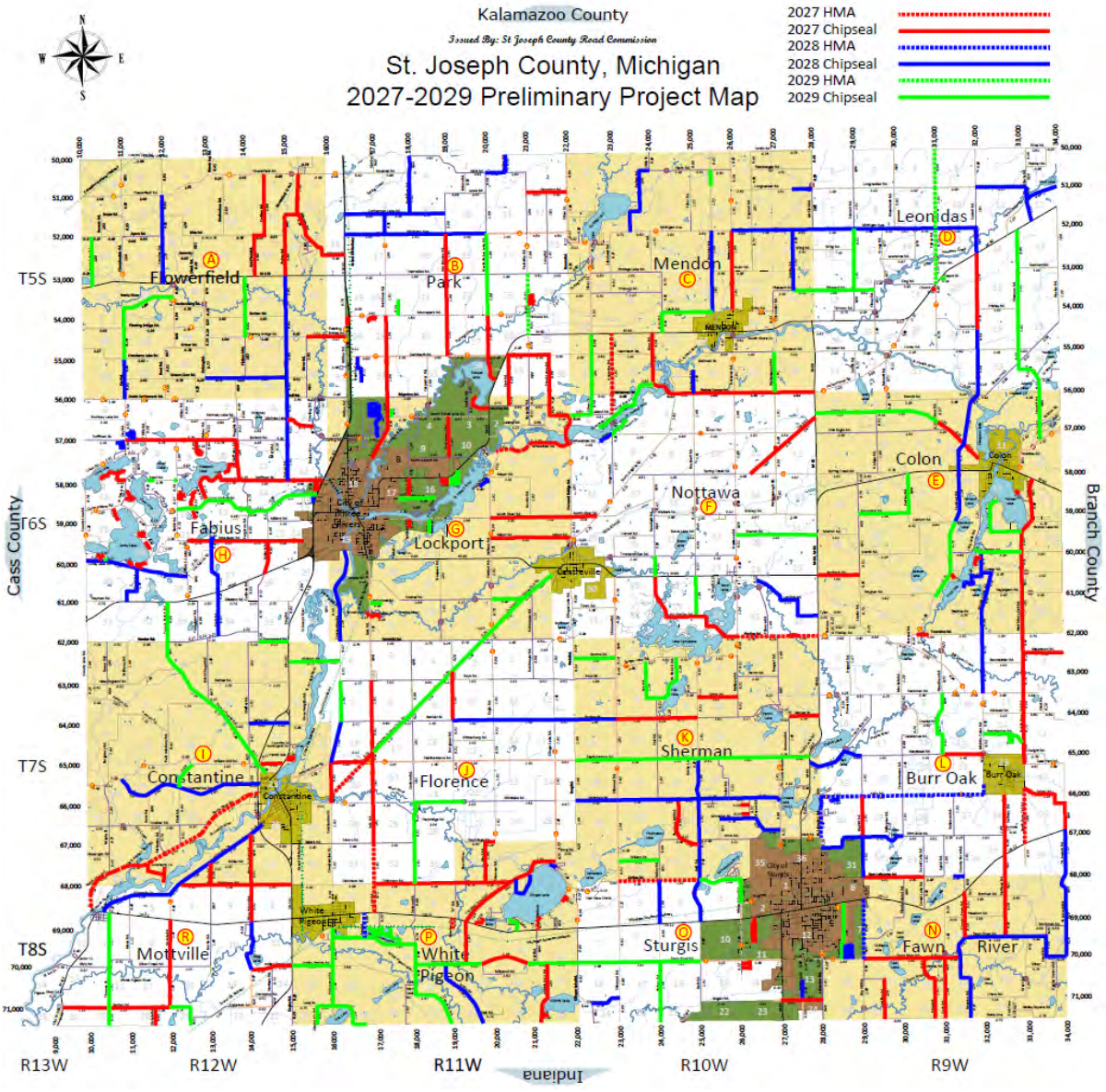

Figure 6 : Map illustrating planned projects for pavement assets

The total cost of the projects illustrated in Figure 6 is approximately $17,300,000

2. BRIDGE ASSETS

SJCRC is responsible for 102 bridges that provide safe service to road users across the agency network. SJCRC seeks to implement a cost-effective program of preventive maintenance to maximize the useful service life and safety of the local bridges under its jurisdiction.

Inventory of Assets

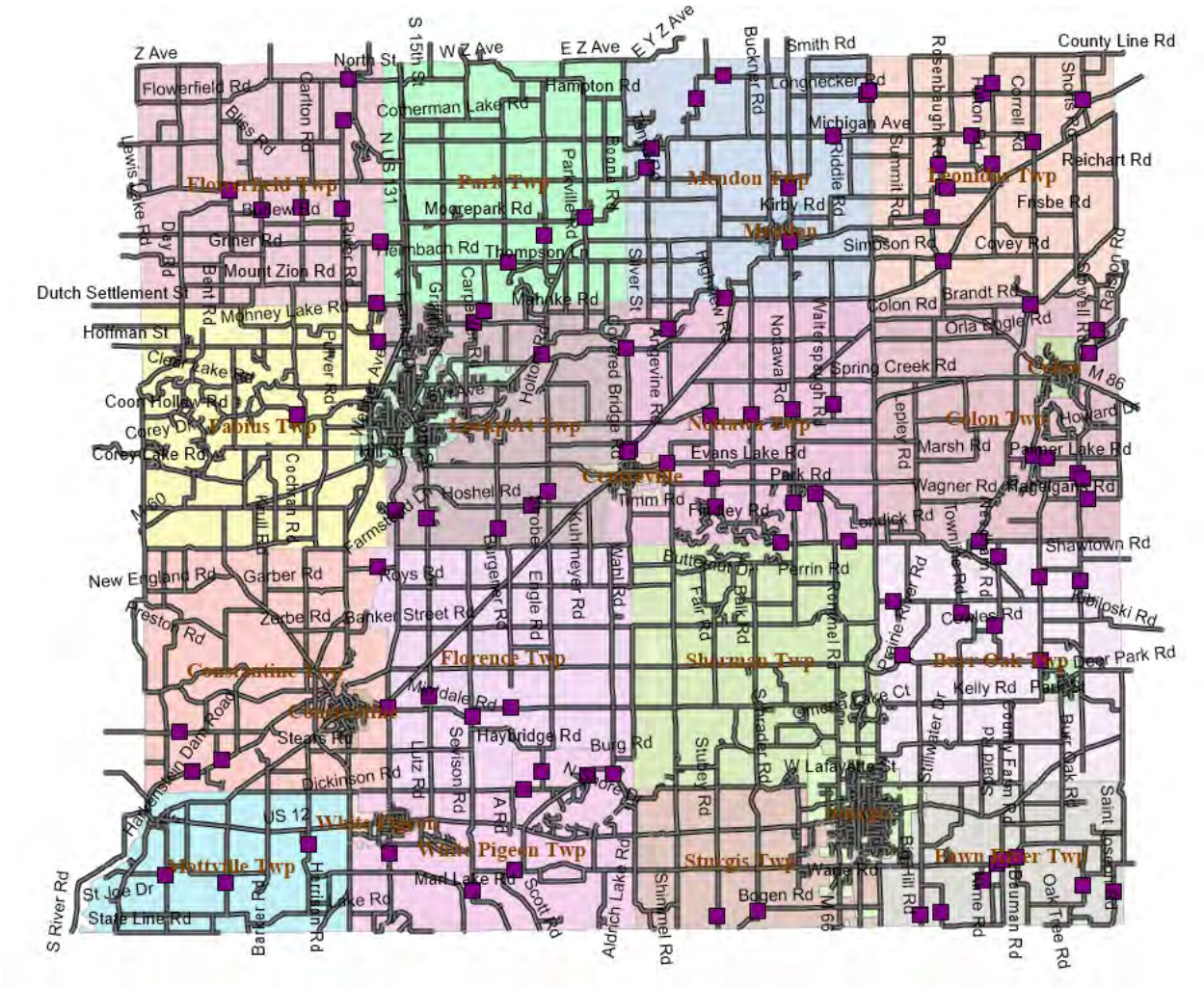

Figure 6: Map illustrating locations of SJCRC's bridge assets

SJCRC has 102 total bridges in its road and bridge network; these bridges connect various points of the road network, as illustrated in Figure . These bridge structures can be summarized by type, size, and condition, which are detailed in Table 2. More information about each of these structures can be found in SJCRC's MiBRIDGE database or by contacting SJCRC.

Table 2: Bridge Assets by Type: Inventory, Size, and Condition								
	Total Number of Bridges	Total Deck Area (sq ft)	Condition: Structurally Deficient, Posted, Closed			2025 Condition		
Bridge Type			Struct. Defic	Posted	Closed	Poor	Fair	Good
Prestressed Concrete I Beam	3	9,992	0	0	0	0	0	3
Prestressed Concrete Box Beam	32	115,637	0	3	0	0	11	21
Concrete Slab	1	1,312	0	0	0	0	0	1
Concrete Box	1	753	0	0	0	0	0	1
Timber Slab	53	104,426	12	14	0	12	32	9
Timber Stringer / Girder	2	2,026	0	2	0	0	2	0
Timber Box Culvert	1	792	0	0	0	0	1	0
Timber Truss / Steel Girder	1	4,502	1	1	0	1	0	0
Steel Stringer / Girder	2	3,291	0	0	0	0	2	0
Steel Culvert	4	2,483	1	0	0	1	3	0
Steel Tub Girder	1	2,008	0	0	0	0	1	0
Aluminum Culvert	1	2,168	0	0	0	0	0	1
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
Total SD/Posted/Closed			**14**	**20**	**0**			
Total	**101**	**249,390**				**14**	**52**	**36**
Percentage (%)			**13.7%**	**19.6%**	**0**	**13.7%**	**51.0%**	**35.3%**

Condition, Goals, and Trend

Bridges in Michigan are given a good, fair, or poor rating based on the National Bridge Inspection Standards (NBIS) rating scale, which was created by the Federal Highway Administration to evaluate a bridge’s deficiencies and to ensure the safety of road users. The current condition of SJCRC’s bridge network based on the NBIS is 36 structures rated good, 52 structures rated fair, and 14 structures rated poor.

Bridges are designed to carry legal loads in terms of vehicles and traffic. Due to a decline in condition, a bridge may be “posted” with a restriction for what would be considered safe loads passing over the bridge. On occasion, posting a bridge may also restrict other load-capacity-related elements like speed and number of vehicles on the bridge, but this type of posting designates the bridge differently. SJCRC has 21 structures that are posted for load restriction. Designating a bridge as “posted” has no influence on its condition rating. A “closed” bridge is one that is closed to all traffic. Closing a bridge is contingent upon its ability to carry a set minimum live load. SJCRC has 0 structures that are closed.

The goal of the program is the preservation and safety of SJCRC’s bridge network.

Figure 7 illustrates the baseline condition, projected trend, and goal that SJCRC has for its good/fair and its structurally deficient bridges.

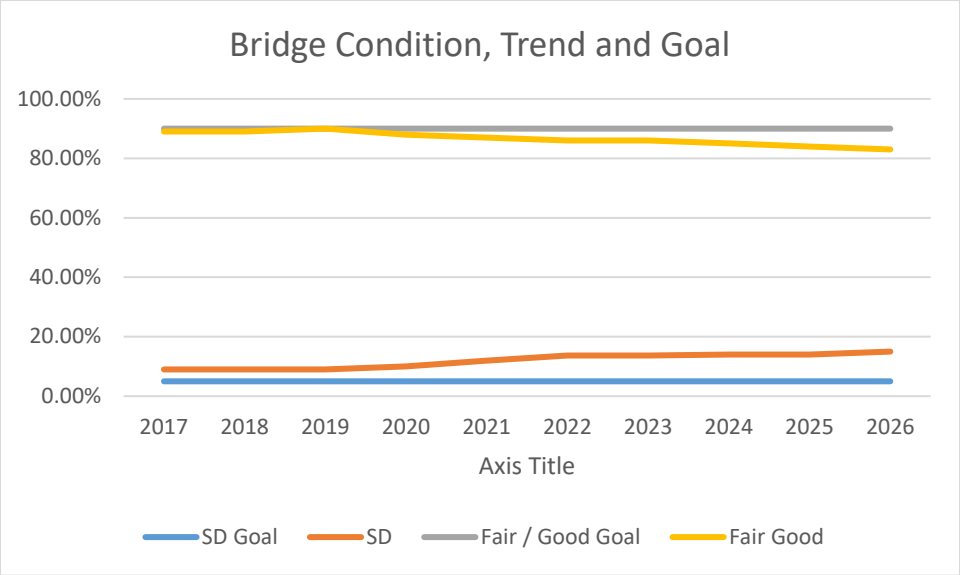

Figure 7: Condition, projected trend, and goal for SJCRC’s good/fair and structurally deficient bridges

Programmed/Funded Projects, Gap Analysis, and Planned Projects

SJCRC will receive $10,600,000 in total funding for the three years. Preventive maintenance is a more effective use of these funds than the costly alternative of major rehabilitation or replacement. Since SJCRC recognizes that limited funds are available for improving the bridge network, it seeks to identify those bridges that will benefit from a planned maintenance program, and it plans to spend $100,000 per year for the next three years on scheduled maintenance of bridges. SJCRC plans to replace 3 bridges over the next three years at a cost of $10,600,000. By performing the aforementioned preventive maintenance and replacement of bridge structures, SJCRC will not achieve it’s goal of keeping its overall bridge network at the same condition. With an average lifespan of 50 years per bridge, replacement of 2 bridges

should happen every year. We rely mostly on grant matches for these replacements. We have received grant funding for the years 2027 and 2028 and with submittals for funding for 2029.

The following illustrates the programmed/funded projects that will be undertaken in order to achieve SJCRC's goal. These programmed/funded projects are juxtaposed with priority projects that remain unfunded.

Strategy	2027	2028	2029
Replacement	$ 1,800,000.00	$ 1,800,000.00	$ 7,000,000.00
Rehabilitation			
Scheduled Maintenance	$ 100,000.00	$ 100,000.00	$ 100,000.00
Preventative Maintenance			
Other			
Total	$ 1,900,000.00	$ 1,900,000.00	$ 7,100,000.00

3. CULVERT ASSETS

The SJCRC has a large amount of culverts that it is responsible for. We track each culvert in our roadsoft program as they are found and put in. As of right now we have 582 culverts inventoried into our system and we believe that we are around 25% complete with our inventory. As culverts fail they are replaced, or if a project is coming up culverts are checked and replaced if the condition of the culvert shows that they will need replacement in the near future.

Inventory of Assets

At present, SJCRC tracks inventory data of its culvert assets only. SJCRC has inventoried 582 culverts, which is 29.3 percent of the 2,000 culverts that SJCRC owns.

More detail about these culvert assets can be found in SJCRC's Roadsoft database or by contacting SJCRC.

Goals

The goal of SJCRC's asset management program is the preservation of its culvert network. SJCRC is responsible for preserving 585 inventoried culverts as well as any un-inventoried culverts that underlie its entire road network.

Planned Projects

SJCRC's policy is to replace or repair culvert assets concurrent with projects affecting road segments carried by the particular culverts. SJCRC also includes culvert assets in scheduled maintenance projects affecting road segments carried by the particular culverts.

4. SIGNAL ASSETS

The SJCRC has 0 traffic signals that it needs to maintain.

Inventory of Assets

At present, SJCRC tracks only inventory data for traffic signals. SJCRC has inventoried 0 traffic signals, which is 0 percent of the 0 traffic signals that SJCRC owns.

More detail about these traffic signal assets can be obtained by contacting SJCRC.

Goals

The goal of SJCRC's asset management program is the preservation of its traffic signals. SJCRC is responsible for preserving 0 inventoried traffic signals as well as any un-inventoried traffic signals along its entire road network.

Planned Projects

SJCRC's policy is to evaluate traffic signal assets based on condition assessment for replacement or repair during any reconstruction, rehabilitation, preventive maintenance, of schedule maintenance activities on the roadway affected by the particular signal. It also conducts replacements or repairs for those traffic signal assets reported as non-functional or as performing with reduced function. SJCRC adheres to regular maintenance and servicing policies outlined in the *Michigan Manual of Uniform Traffic Control Devices*.

5. FINANCIAL RESOURCES

Public entities must balance the quality and extent of services they can provide with the tax resources provided by citizens and businesses, all while maximizing how efficiently funds are used. Therefore, SJCRC will overview its general expenditures and financial resources currently devoted to transportation infrastructure maintenance. This financial information is not intended to be a full financial disclosure or a formal report. Full details of SJCRC's financial status can be found on our website at stjoeroads.com.

Anticipated Revenues & Expenses

SJCRC receives funding from the following sources:

- **State funds** – SJCRC's principal source of transportation funding is received from the Michigan Transportation Fund (MTF). This fund is supported by vehicle registration fees and the state's per-gallon gas tax. Allocations from the MTF are distributed to state and local governmental units based on a legislated formula, which includes factors such as population, miles of certified roads, and vehicle registration fees for vehicles registered in the agency's jurisdiction. Examples of state grants also include local bridge grants, economic development funds, and metro funds.
- **Federal and state grants for individual projects** – These are typically competitive funding applications that are targeted at a specific project type to accomplish a specific purpose. These may include safety enhancement projects, economic development projects, or other targeted funding. Examples of federal funds include Surface Transportation Program (STP) funds, C and D funds, bridge funds, MDOT payments to private contractors, and negotiated contracts.
- **Local government entities or private developer contributions to construction projects for specific improvements** – This category includes funding received to mitigate the impact of

commercial developments as a condition of construction of a specific development project, and can also include funding from a special assessment district levied by another governmental unit. Examples of contributions from local units include city, village, and township contributions to the county; special assessments; county appropriations; bond and note proceeds; contributions from counties to cities and villages; city general fund transfers; city municipal street funds; capital improvement funds; and tax millages (see below).

- **Local tax millages** – Many local agencies in Michigan use local tax millages to supplement their road-funding budget. These taxes can provide for additional construction and maintenance for new or existing roads that are also funded using MTF or MDOT funds. SJCRC has local tax millages in its road-funding budget. There is a 1 mil millage that is designated for the maintenace of the local road system. These funds are used for our sealcoat program, matches on grants received on local projects and culvert replacements.
- **Interest** – Interest from invested funds.
- **Permit fees** – Generally, permit fees cover the cost of a permit application review.
- **Other** – Other revenues can be gained through salvage sales, property rentals, land and building sales, sundry refunds, equipment disposition or installation, private sources, and financing.
- **Charges for services** – Funds from partner agencies who contract with SJCRC to construct or maintain its roads, or roads under joint or neighboring jurisdictions, including state trunkline maintenance and non-maintenance services and preservation.

SJCRC is required to report transportation fund expenditures to the State of Michigan using a prescribed format with predefined expenditure categories. The definitions of these categories according to Public Act 51 of 1951 may differ from common pavement management nomenclature and practice. For the purposes of reporting under PA 51, the expenditure categories are:

- **Construction/Capacity Improvement Funds** – According to PA 51 of 1951, this financial classification of projects includes, "new construction of highways, roads, streets, or bridges, a project that increases the capacity of a highway facility to accommodate that part of traffic having neither an origin nor destination within the local area, widening of a lane width or more, or adding turn lanes of more than 1/2 mile in length."[1]
- **Preservation and Structural Improvement Funds** – Preservation and structural improvements are "activit[ies] undertaken to preserve the integrity of the existing roadway system."[2] Preservation includes items such as a reconstruction of an existing road or bridge, or adding structure to an existing road.
- **Routine and Preventive Maintenance Funds** – Routine maintenance activities are "actions performed on a regular or controllable basis or in response to uncontrollable events upon a highway, road, street, or bridge".[3] Preventive maintenance activities are "planned strategy[ies] of

[1] Public Act 51 of 1951, 247.660c Definitions
[2] Public Act 51 of 1951, 247.660c Definitions
[3] Public Act 51 of 1951, 247.660c Definitions

cost-effective treatments to an existing roadway system and its appurtenances that preserve assets by retarding deterioration and maintaining functional condition without significantly increasing structural capacity".[4]

- **Winter Maintenance Funds** – Expenditures for snow and ice control.
- **Trunkline Maintenance Funds** – Expenditures spent under SJCRC's maintenance agreement with MDOT, if a maintenance agreement was made with MDOT, for maintenance it performs on MDOT trunkline routes.
- **Administrative Funds** – There are specific items that can and cannot be included in administrative expenditures as specified in PA 51 of 1951. The law also states that the amount of MTF revenues that are spent on administrative expenditures is limited to 10 percent of the annual MTF funds that are received.
- **Other Funds** – Expenditures for equipment, capital outlay, debt principal payment, interest expense, contributions to adjacent governmental units, principal, interest and bank fees, and miscellaneous for cities and villages.

The Table (below) details the revenues and expenditures for SJCRC.

[4] Public Act 51 of 1951, 247.660c Definitions

Revenues		Expenditures		
Item	Estimate $	Item	Estimate$	Percent of Total
2027	$ 11,456,512.16	2027	$ -	
2028	$ 11,504,170.52	2028	$ -	
2029	$ 11,982,027.14	2029	$ -	
Total State Funds	$ 34,942,709.82	Construction & Capacity improvements	$ -	0.00%
2027	$ 7,307,000.00	2027	$ 13,940,035.14	
2028	$ 2,524,000.00	2028	$ 7,661,819.26	
2029	$ 839,000.00	2029	$ 6,207,677.93	
Total Federal Funds	$ 10,670,000.00	Preservation & Structural Improvements	$ 27,809,532.33	49.47%
2027	$ 3,500,000.00	2027	$ 6,000,000.00	
2028	$ 3,605,000.00	2028	$ 6,180,000.00	
2029	$ 3,713,150.00	2029	$ 6,365,400.00	
Contributions from local units	$ 10,818,150.00	Routine Maintenance	$ 18,545,400.00	32.99%
2027	$ 35,000.00	2027	$ 1,500,000.00	
2028	$ 36,050.00	2028	$ 1,545,000.00	
2029	$ 37,131.50	2029	$ 1,591,350.00	
Interest, rents and other	$ 108,181.50	Winter Maintenance	$ 4,636,350.00	8.25%
2027	$ 40,000.00	2027	$ -	
2028	$ 41,200.00	2028	$ -	
2029	$ 42,436.00	2029	$ -	
Charges for Services	$ 123,636.00	Trunkline Maintenance	$ -	0.00%
		2027	$ 700,000.00	
		2028	$ 721,000.00	
		2029	$ 742,630.00	
		Administrative	$ 2,163,630.00	3.85%
		2027	$ 1,000,000.00	
		2028	$ 1,020,000.00	
		2029	$ 1,040,400.00	
		Other	$ 3,060,400.00	5.44%
Total	$ 56,662,677.32	Total	$ 56,215,312.33	100.00%

Table 3: Annual Fiscal-Year Revenues & Expenditures by Fiscal Year i

6. RISK OF FAILURE ANALYSIS

Transportation infrastructure is designed to be resilient. The system of interconnecting roads and bridges maintained by SJCRC provides road users with multiple alternate options in the event of an unplanned disruption of one part of the system. There are, however, key links in the transportation system that may cause significant inconvenience to users if they are unexpectedly closed to traffic. Key transportation links include:

- **Geographic divides:** Areas where a geographic feature (river, lake, hilly terrain, or limited access road) limits crossing points of the feature; bridge failures, in particular, can create loss of access to entire regions of the state
- **Emergency alternate routes for high-volume roads and bridges:** Roads and bridges that are routinely used as alternate routes for high-volume assets are included in an emergency response plan
- **Limited access areas:** Roads and bridges that serve remote or limited access areas that result in long detours if closed
- **Main access to key commercial districts:** Areas with a large concentration of businesses or where large-size businesses will be significantly impacted if a road is unavailable
- Our road network includes the following critical assets:
    - Flowerfield Road / Johnson Road / Pulver connected M-216 to US-131

- Bent / Dutch Settlement / Hoffman / Stoldt / Abby / Broadway connects M-216 into the City of Three Rivers and provides access around a very large lake system.
- Broadway / Roberts connects US-131 to M-60
- Youngs Prairie provides a connection between M-60 to US-131
- Riverside drive provides a connection from US-12 to US-131
- Anderson / Blue School provides access to Anderson Farms during all weather times.
- Indian Prairie Road provides an alternate route next to US-12
- Indian Prairie / Kalamazoo provides an access over White Pigeon River
- Scotts Road provides a route towards Shipshewana
- A Road provides a route to the White Pigeon Compressor Station
- Centreville – Constantine provides a route between the Village of Centreville and the Village of Constantine
- Withers / Constantine provides a crossing over the St. Joseph River and is the only crossing between the city of Three Rivers and the Village of Constantine.
- Lutz is the route from the City of Three Rivers to the Village of White Pigeon
- Shimmel provides a connection between M-86 and US-12
- Wait Road / North Centreville Road provides a connection to the industrial district in the North West of the City of Sturgis off of M-66.
- White School / Progress provides a connection to the industrial district in the North West of the City of Sturgis off of US-12
- Franks Ave provides access from US-12 to Fawn River Road and passes the City of Sturgis High School and Eastwood
- Halfway Road Connects Burr Oak to US-12 and Fawn River Road
- East Lafayette and Big Hill connects US-12 to M-66 and provides an access to the Sturgis Middle School
- North Burr Oak Road / Sprowl Road connects the Village of Burr Oak to M-86
- Hackman Road proves connection between M-66 and North Burr Oak Road
- Shawtown provides a connection from North Burr Oak Road into Branch County
- Nottawa Road connects M-86 to Kalamazoo County and also runs through the Village of Mendon connecting M-60
- North Angling / Butler connects the Village of Centreville to Nottawa Road

- Angevine Road / Leland / Silver Street provides a crossing over the St. Joseph River and gives access to trucks that cannot cross the Langley Covered Bridge to the west.
- Holtom / Schweitzer provides a crossing over the St. Joseph River and connects M-86 to M-60
- Heimbach Road provides a connection between US-131 and M-60
- Silver Street provides a connection between M-60 and Kalamazoo County which leads to the Village of Vicksburg
- Michigan Ave provides access from US-131 across the majority of the county and gives an alternate route for M-60
- Jacksonburg Road connects M-66 with M-60
- Colon Road gives access from M-66 into the Village of Colon
- Farrand / Swonk / Fulton provides access from M-86 to Kalamazoo County, runs through M-60 and the Village of Leonidas. It also crosses the St. Joseph River and is the longest crossing the SJCRC has.
- Wattles Road is the route from M-86 to the Village of Sherwood in Branch County

- Our bridge network includes the following critical assets:
  - SN 10324 Farrand Road over the St. Joseph River is the longest bridge that we have under the jurisdiction of the SJCRC. This bridge was built in 1965 and is scheduled to be replaced in 2026-2027.
  - Scour Critical Bridges
    - 10370 – Hagelgans over Washburn Creek
  - Bridges with NBI rating of 3 or less
    - 10369 – Walterspaugh over Spring Creek – No plans for replacement, possibly close when necessary.
    - 14530 – Longnecker Road over Beak Creek – 4 Culverts that will be requested for replacement in 2030.

Figure 8 illustrates the key transportation links in SJCRC's road network.

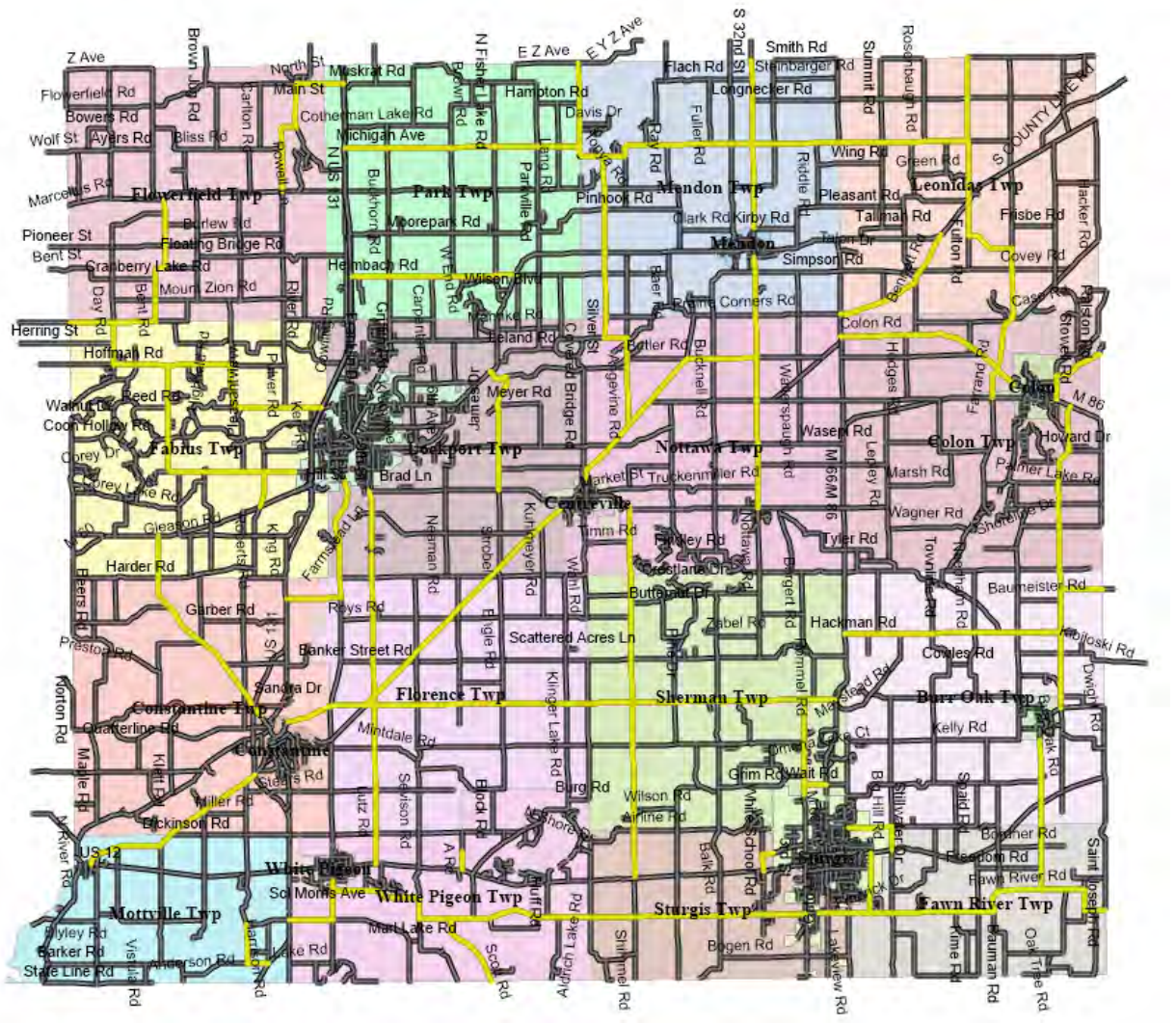

Figure 8: Key transportation links in SJCRC's road and bridge network

7. COORDINATION WITH OTHER ENTITIES

An asset management plan provides a significant value for infrastructure owners because it serves as a platform to engage other infrastructure owners using the same shared right of way space. SJCRC communicates with both public and private infrastructure owners to coordinate work in the following ways:

Projects that will be paved in a given year are coordinated with all existing utility owners to protect the investment of the SJCRC for a project. Utilities that need upgrades, or need to relocate are required to do before a project starts.

The SJCRC meets with township representatives at the end of each year to discuss planned project in their township. With the match program that SJCRC has with the townships, coordinated projects are suggested and put into the next years plan. Townships that have a designated amount of money that they are going to spend have a multiyear plan set up, like White Pigeon Township.

8. PROOF OF ACCEPTANCE

PUBLIC ACT 325

CERTIFICATION OF TRANSPORTATION ASSET MANAGEMENT PLAN

Certification Year: 2026

Local Road-owning Agency Name: St. Joseph County Road Commission

Beginning October 2019 and on a three-year cycle thereafter, certification must be made for compliance to Public Act 325. A local road-owning agency with 100 certified miles or more must certify that it has developed an asset management plan for the road, bridge, culvert, and traffic signal assets. Signing this form certifies that the hitherto referred agency meets with minimum requirements as outlined by Public Act 325 and agency-defined goals and objectives.

This form must be signed by the chairperson of the local road-owning agency or the county executive and chief financial officer of the local road-owning agency.

Signature		Signature	
Printed Name Rodney Chupp		Printed Name Garrett Myland, PE.	
Title Chairman of Board	Date 8/19/2026	Title Manager	Date 8/19/2026

Due every three years based on agency submission schedule

Submittal Date: 8/19/2026

See attached council meeting minutes and/or resolution.

CERTIFIED RESOLUTION

Moved by Commissioner Mifsud seconded by Commissioner Bippus to approve the St Joseph County Road Commission 2026 Transportation Asset Management Plan

Whereas: The St. Joseph County Road Commission is a local road-owning agency with more than 100 certified miles.

Whereas: Beginning October 2019 and on a three-year cycle thereafter, certification of a transportation asset management plan must be made for compliance to Public Act 325

Whereas: This Asset Management plan meets the minimum requirements for road, bridge, culvert and traffic signal assets as outlined by Public Act 325.

A roll call vote was taken:

Aye Votes Cast: Brown, Bippus, Miars, Mifsud, Chupp Nays: None
Absent: None Abstained: None Motion carried.

I, Sarah Linn, Deputy Clerk of the Board of County Road Commission of the County of St. Joseph, State of Michigan, hereby certify that the above is a true and correct copy as recorded in the minutes of the meeting of August 19, 2026

Sarah Linn
Deputy Clerk of the Board

A. PAVEMENT ASSET MANAGEMENT PLAN

An attached pavement asset management plan follows.

St. Joseph County Road Commission
2026 Pavement Asset Management Plan

A plan describing the St. Joseph County Road Commission’s roadway assets and conditions

Prepared by: Garrett Myland
Author: Garrett Myland
Author's title: Managing Director
Contact information: gmyland@sjcrc.com

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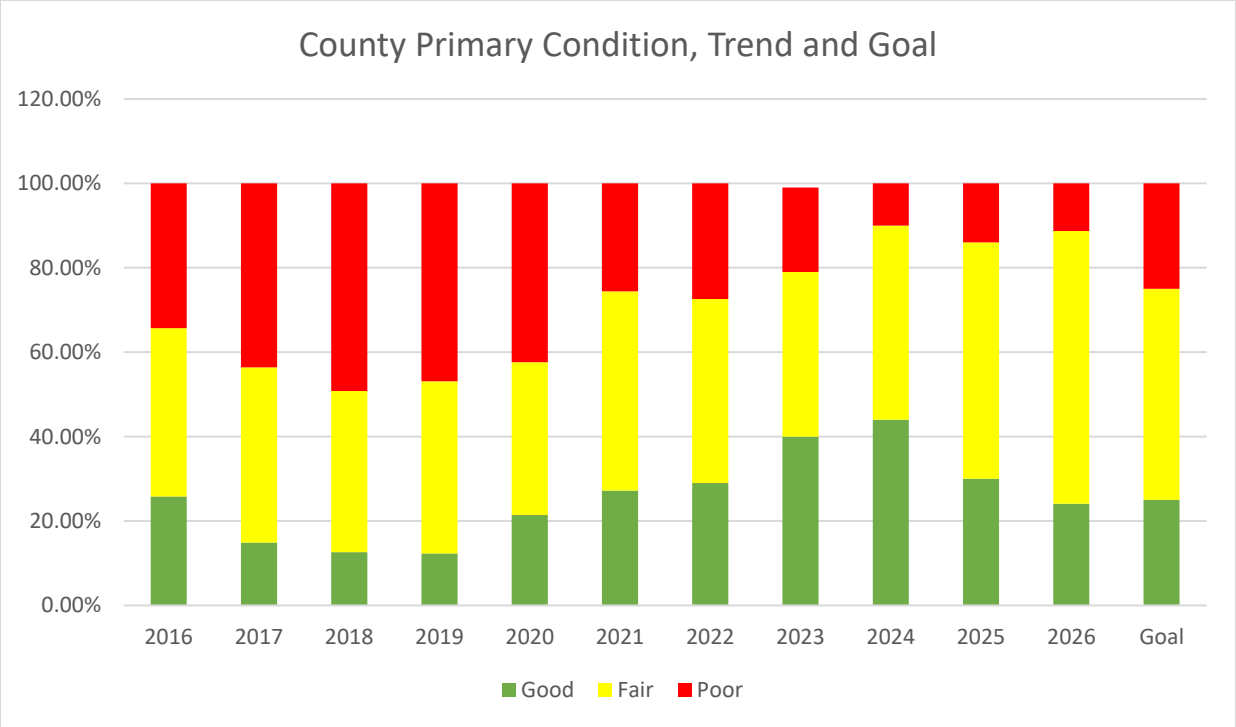
EXECUTIVE SUMMARY

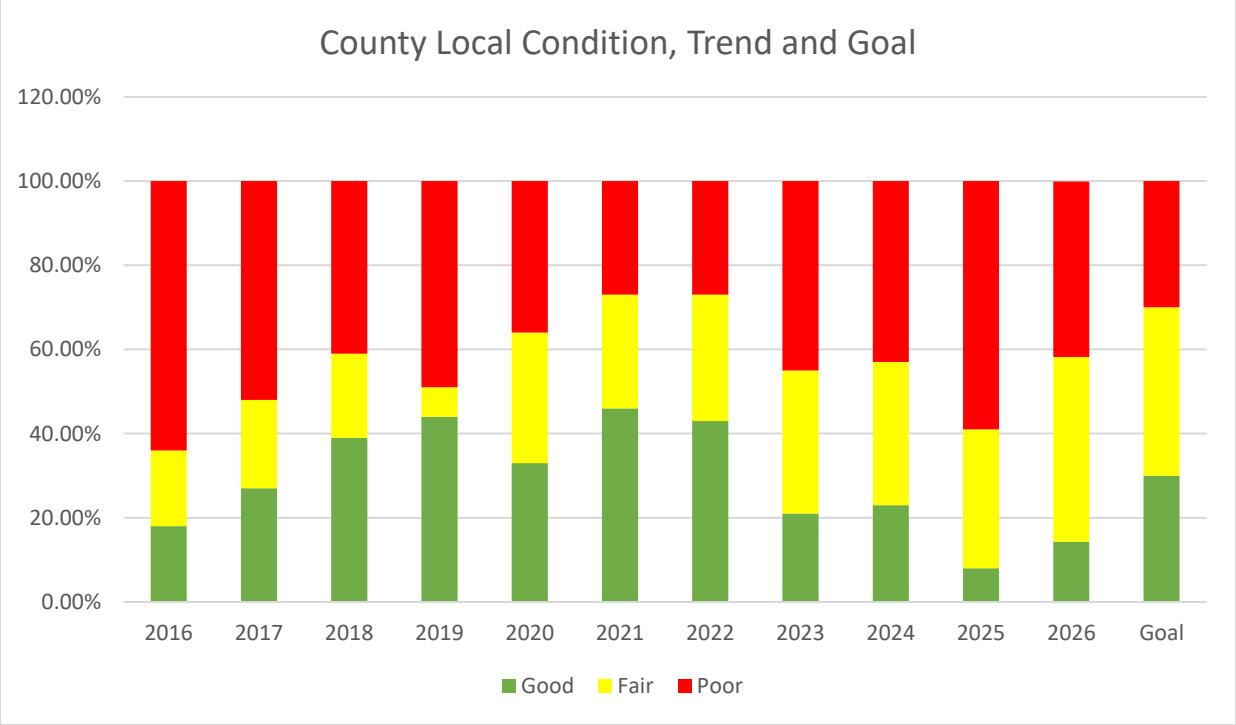
As conduits for commerce and connections to vital services, roads are among the most important assets in any community along with other assets like bridges, culverts, traffic signs, and utilities that support and affect roads. The St. Joseph County Road Commission's (SJCRC) roads, other transportation assets, and support systems are also some of the most valuable and extensive public assets, all of which are paid for with taxes collected from ordinary citizens and businesses. The cost of building and maintaining roads, their importance to society, and the investment made by taxpayers all place a high level of responsibility on local agencies to plan, build, and maintain the road network in an efficient and effective manner. This asset management plan is intended to report on how SJCRC is meeting its obligations to maintain the public assets for which it is responsible.

This plan overviews SJCRC's road assets and condition, and explains how SJCRC works to maintain and improve the overall condition of those assets. These explanations can help answer the following questions:

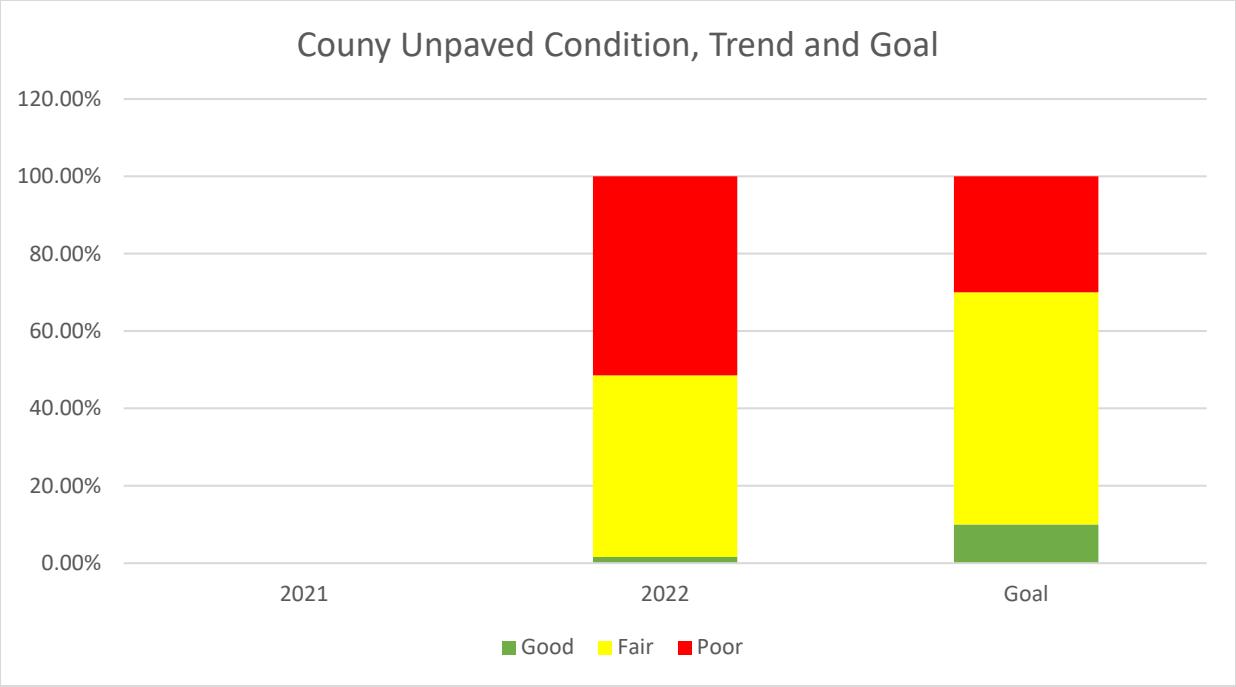
- What kinds of road assets SJCRC has in its jurisdiction, who owns them, and the different options for maintaining these assets.
- What tools and processes SJCRC uses to track and manage road assets and funds.
- What condition SJCRC's road assets are in compared to statewide averages.
- Why some road assets are in better condition than others and the path to maintaining and improving road asset conditions through proper planning and maintenance.
- How agency transportation assets are funded and where those funds come from.
- How funds are used and the costs incurred during SJCRC's road assets' normal life cycle.
- What condition SJCRC can expect its road assets if those assets continue to be funded at the current funding levels
- How changes in funding levels can affect the overall condition of all of SJCRC's road assets.

SJCRC owns and/or manages 1020.354 centerline of roads. This road network can be divided into the county primary network, the county local network, the unpaved road network, and the National Highway System (NHS) network based on the different factors these roads have that influence asset management decisions. A summary of SJCRC historical and current network conditions, projected trends, and goals for county primary network and county local network can be seen in the following figures.





A summary of SJCRC historical and current network conditions, projected trend and goal for the unpaved road network can be seen in Figure:



An asset management plan is required by Michigan Public Act 325 of 2018, and this document represents fulfillment of some of SJCRC's obligations towards meeting these requirements. This asset management plan also helps demonstrate SJCRC's responsible use of public funds by providing elected and appointed officials as well as the general public with inventory and condition information of SJCRC's road assets, and gives taxpayers the information they need to make informed decisions about investing in its essential transportation infrastructure.

INTRODUCTION

Asset management is defined by Public Act 325 of 2018 as “an ongoing process of maintaining, preserving, upgrading, and operating physical assets cost effectively, based on a continuous physical inventory and condition assessment and investment to achieve established performance goals”. In other words, asset management is a process that uses data to manage and track assets, like roads and bridges, in a cost-effective manner using a combination of engineering and business principles. This process is endorsed by leaders in municipal planning and transportation infrastructure, including the Michigan Municipal League, County Road Association of Michigan, the Michigan Department of Transportation (MDOT), and the Federal Highway Administration (FHWA). SJCRC is supported in its use of asset management principles and processes by the Michigan Transportation Asset Management Council (TAMC), formed by the State of Michigan.

Asset management, in the context of this plan, ensures that public funds are spent as effectively as possible to maximize the condition of the road network. Asset management also provides a transparent decision-making process that allows the public to understand the technical and financial challenges of managing road infrastructure with a limited budget.

The St. Joseph County Road Commission (SJCRC) has adopted an “asset management” business process to overcome the challenges presented by having limited financial, staffing, and other resources while needing to meet road users’ expectations. SJCRC is responsible for maintaining and operating over 1020.354 centerline of roads.

This plan outlines how SJCRC determines its strategy to maintain and upgrade road asset condition given agency goals, priorities of its road users, and resources provided. An updated plan is to be released approximately every three years to reflect changes in road conditions, finances, and priorities.

Questions regarding the use or content of this plan should be directed to Garrett Myland at 20914 M-86, Centreville, MI 49032 or at (269)467-6393 and gmyland@sjcrc.com. Key terms used in this plan are defined in SJCRC’s comprehensive transportation asset management plan (also known as the “compliance plan”) used for compliance with PA 325 or 2018.

Knowing the basic features of the asset classes themselves is a crucial starting point to understanding the rationale behind an asset management approach. The following primer provides an introduction to pavements.

Pavement Primer

Roads come in two basic forms—paved and unpaved. Paved roads have hard surfaces. These hard surfaces can be constructed from asphalt, concrete, composite (asphalt and concrete), sealcoat, and brick and block materials. On the other hand, unpaved roads have no hard surfaces. Examples of these surfaces are gravel and unimproved earth.

The decision to pave with a particular material as well as the decision to leave a road unpaved allows road-owning agencies to tailor a road to a particular purpose, environment, and budget. Thus, selecting a pavement type or leaving a road unpaved depends upon purpose, materials available, and budget. Each choice represents a trade-off between budget and costs for construction and maintenance.

Maintenance enables the road to fulfill its particular purpose. To achieve the maximum service for a pavement or an unpaved road, continual monitoring of a road's pavement condition is essential for choosing the right time to apply the right fix in the right place.

Here is a brief overview of the different types of pavements, how condition is assessed, and treatment options that can lengthen a road's service life.

Surfacing

Pavement type is influenced by several different factors, such as cost of construction, cost of maintenance, frequency of maintenance, and type of maintenance. These factors can have benefits affecting asset life and road user experience.

Paved Surfacing

Typical benefits and tradeoffs for hard surface types include:

- **Concrete pavement:** Concrete pavement, which is sometimes called a rigid pavement, is durable and lasts a long time when properly constructed and maintained. Concrete pavement can have longer service periods between maintenance activities, which can help reduce maintenance-related traffic disruptions. However, concrete pavements have a high initial cost and can be challenging to rehabilitate and maintain at the end of their service life. A typical concrete pavement design life will provide service for 30 years before major rehabilitation is necessary.
- **Hot-mix asphalt pavement (HMA):** HMA pavement, sometimes known as asphalt or flexible pavement, is currently less expensive to construct than concrete pavement (this is, in some part, due to the closer link between HMA material costs and oil prices that HMA pavements have in comparison with other pavement types). However, they require frequent maintenance activities to maximize their service life. A typical HMA pavement design life will provide service for 18 years before major rehabilitation is necessary. The vast majority of local-agency-owned pavements are HMA pavements.

- **Composite pavements:** Composite pavement is a combination of concrete and asphalt layers. Typically, composite pavements are old concrete pavements exhibiting ride-related issues that were overlaid by several inches of HMA in order to gain more service life from the pavement before it would need reconstruction. Converting a concrete pavement to a composite pavement is typically used as a "holding pattern" treatment to maintain the road in usable condition until reconstruction funds become available.
- **Sealcoat pavement:** Sealcoat pavement is a gravel road that have been sealed with a thin asphalt binder coating that has stone chips spread on top (not to be confused with a chip seal treatment over HMA pavement). This type of a pavement relies on the gravel layer to provide structure to support traffic, and the asphalt binder coating and stone chips shed water and eliminate the need for maintenance grading. Nonetheless, sealcoat pavement does require additional maintenance steps that asphalt and gravel do not require and does not last as long as HMA pavement, but it provides a low-cost alternative for lightly-trafficked areas and competes with asphalt for ride quality when properly constructed and maintained. Sealcoat pavement can provide service for ten or more years before the surface layer deteriorates and needs to be replaced.

Unpaved Surfacing

Typical benefits and tradeoffs for non-hard surfacing include:

- **Gravel:** Gravel is a low-cost, easy-to-maintain road surface made from layers of soil and aggregate (gravel). However, there are several potential drawbacks such as dust, mud, and ride smoothness when maintenance is delayed or traffic volume exceeds design expectations. Gravel roads require frequent low-cost maintenance activities. Gravel can be very cost effective for lower-volume, lower-speed roads. In the right conditions, a properly constructed and maintained gravel road can provide a service life comparable to an HMA pavement and can be significantly less expensive than the other pavement types.

Pavement Condition

Besides traffic congestion, pavement condition is what road users typically notice most about the quality of the roads that they regularly use—the better the pavement condition, the more satisfied users are with the service provided by the roadwork performed by road-owning agencies. Pavement condition is also a major factor in determining the most cost-effective treatment—that is, routine maintenance, capital preventive maintenance, or structural improvement—for a given section of pavement. As pavements age, they transition between "windows" of opportunity when a specific type of treatment can be applied to gain an increase in quality and extension of service life. Routine maintenance is day-to-day, regularly-scheduled, low-cost activity applied to "good" roads to prevent water or debris intrusion. Capital preventive maintenance (CPM) is a planned set of cost-effective treatments for "fair" roads that corrects pavement defects, slows further deterioration, and maintains the functional condition without increasing structural capacity. SJCRC uses pavement condition and age to anticipate when a specific section of pavement will be a potential candidate for preventive maintenance. More detail on this topic is included in the *Pavement Treatment* section of this primer.

Pavement condition data is also important because it allows road owners to evaluate the benefits of preventive maintenance projects. This data helps road owners to identify the most cost-effective use of road construction and maintenance dollars. Further, historic pavement condition data can enable road owners to predict future road conditions based on budget constraints and to determine if a road network's condition will improve, stay the same, or degrade at the current or planned investment level. This analysis can help determine how much additional funding is necessary to meet a network's condition improvement goals.

Paved Road Condition Rating System

SJCRC is committed to monitoring the condition of its road network and using pavement condition data to drive cost-effective decision-making and preservation of valuable road assets. SJCRC uses the Pavement Surface Evaluation and Rating (PASER) system to assess its paved roads. PASER was developed by the University of Wisconsin Transportation Information Center to provide a simple, efficient, and consistent method for evaluating road condition through visual inspection. The widely-used PASER system has specific criteria for assessing asphalt, concrete, sealcoat, and brick and block pavements. Information regarding the PASER system and PASER manuals may be found on the TAMC website at: http://www.michigan.gov/tamc/0,7308,7-356-82158_82627---,00.html.

The TAMC has adopted the PASER system for measuring statewide pavement conditions in Michigan for asphalt, concrete, composite, sealcoat, and brick-and-block paved roads. Broad use of the PASER system means that data collected at SJCRC is consistent with data collected statewide. PASER data is collected using trained inspectors in a slow-moving vehicle using GPS-enabled data collection software provided to road-owning agencies at no cost to them. The method does not require extensive training or specialized equipment, and data can be collected rapidly, which minimizes the expense for collecting and maintaining this data.

The PASER system rates surface condition using a 1-10 scale where 10 is a brand new road with no defects that can be treated with routine maintenance, 5 is a road with distresses but is structurally sound that can be treated with preventive maintenance, and 1 is a road with extensive surface and structural distresses that is in need of total reconstruction.

Roads with lower PASER scores generally require costlier treatments to restore their quality than roads with higher PASER scores. The cost effectiveness of treatments generally decreases as the PASER number decreases. In other words, as a road deteriorates, it costs more dollars per mile to fix it, and the dollars spent are less efficient in increasing the road's service life. Nationwide experience and asset management principles tell us that a road that has deteriorated to a PASER 4 or less will cost more to improve and the dollars spent are less efficient. Understanding this cost principle helps to draw meaning from the current PASER condition assessment.

The TAMC has developed statewide definitions of road condition by creating three simplified condition categories—"good", "fair", and "poor"—that represent bin ranges of PASER scores having similar contexts with regard to maintenance and/or reconstruction. The definitions of these rating conditions are:

- "Good" roads, according to the TAMC, have PASER scores of 8, 9, or 10. Roads in this category have very few, if any, defects and only require minimal maintenance; they may be kept in this category longer using PPM. These roads may include those that have been recently seal coated or newly constructed. Figure 1 illustrates an example of a road in this category.
- "Fair" roads, according to the TAMC, have PASER scores of 5, 6, or 7. Roads in this category still show good structural support, but their surface is starting to deteriorate. Figure 1 illustrates two road examples in this category. CPM can be cost effective for maintaining the road's "fair" condition or even raising it to "good" condition before the structural integrity of the pavement has been severely impacted. CPM treatments can be likened to shingles on a roof of a house: while the shingles add no structural value, they protect the house from structural damage by maintaining the protective function of a roof covering.
- "Poor" roads, according to the TAMC, have PASER scores of 1, 2, 3, or 4. These roads exhibit evidence that the underlying structure is failing, such as alligator cracking and rutting. These roads must be rehabilitated with treatments like a heavy overlay, crush and shape, or total reconstruction. Figure 1 illustrates a road in this category.

Figure 1: *Top image, right*– PASER 8 road that is considered "good" by the TAMC exhibit only minor defects. *Second image, right*– PASER 5 road that is considered "fair" by the TAMC. Exhibiting structural soundness but could benefit from CPM. *Third image, right*– PASER 6 road that is considered "fair" by the TAMC. *Bottom image, right*– PASER 2 road that is considered "poor" by the TAMC exhibiting significant structural distress.

The TAMC's good, fair, and poor categories are based solely on the definitions, above. Therefore, caution should be exercised when comparing other condition assessments with these categories because other

condition assessments may have “good”, “fair”, or “poor” designations similar to the TAMC condition categories but may not share the same definition. Often, other condition assessment systems define the “good”, “fair”, and “poor” categories differently, thus rendering the data of little use for cross-system comparison. The TAMC’s definitions provide a statewide standard for all of Michigan’s road-owning agencies to use for comparison purposes.

PASER data is collected 100 percent every two years on all federal-aid-eligible roads in Michigan. The TAMC dictates and funds the required training and the format for this collection, and it shares the data regionally and statewide. In addition, SJCRC collects 33 percent of its paved non-federal-aid-eligible network using its own staff and resources.

Unpaved Road Condition Rating System (IBR System™)

The condition of unpaved roads can be rapidly changing, which makes it difficult to obtain a consistent surface condition rating over the course of weeks or even days. The PASER system works well on most paved roads, which have a relatively-stable surface condition over several months, but it is difficult to adapt to unpaved roads. To address the need for a reliable condition assessment system for unpaved roads, the TAMC adopted the Inventory Based Rating (IBR) System™, and SJCRC also uses the IBR System™ for rating its unpaved roads. Information about the IBR System™ can be found at http://ctt.mtu.edu/inventory-based-rating-system.

Figure 2: *Top*– Road with IBR number of 1 road that has poor surface width, poor drainage adequacy, and poor structural adequacy. *Middle*– Road IBR number of 7 that has fair surface width, fair drainage adequacy, and fair structural adequacy. *Bottom*– Road with IBR number of 9 road that has good surface width, good drainage adequacy, and good structural adequacy.

The IBR System™ gathers reliable condition assessment data for unpaved road by evaluating three features—surface width, drainage adequacy, and structural adequacy—in comparison to a baseline, or generally considered “good”, road. These three assessments come together to generate an overall 1-10 IBR number. A high IBR number reflects a road with wide surface width, good drainage, and a well-designed and well-constructed base, whereas a low IBR number reflects a narrow road with no ditches and little gravel. A good, fair, or poor assessment of each feature is not an endorsement or indictment of a road’s suitability for use but simply provides context on how these road elements compare to a baseline condition.

Figure 2 illustrates the range over which features may be assessed. The top example in Figure 2 shows an unpaved road with a narrow surface width, little or no drainage, and very little gravel thickness. Using the IBR System™, these assessments would yield an IBR number of “1” for this road. The middle example in Figure 2 shows a road with fair surface width, fair drainage adequacy, and fair

structural adequacy. These assessments would yield an IBR number of “7” for this road. The bottom example in Figure 2 shows a road with good surface width, good drainage adequacy, and good structural adequacy. These assessments would yield an IBR number of “9” for this road.

Unpaved roads are constructed and used differently throughout Michigan. A narrow, unpaved road with no ditches and very little gravel (low IBR number) may be perfectly acceptable in a short, terminal end of the road network, for example, on a road segment that ends at a lake or serves a limited number of unoccupied private properties. However, high-volume unpaved roads that serve agricultural or other industrial activities with heavy trucks and equipment will require wide surface width, good drainage, and a well-designed and well-constructed base structure (high IBR number). Where the unpaved road is and how it is used determines how the road must be constructed and maintained: just because a road has a low IBR number does not necessarily mean that it needs to be upgraded. The IBR number are not an endorsement or indictment of the road’s suitability for use but rather, an indication of a road’s capabilities to support different traffic volumes and types in all weather.

Pavement Treatments

Selection of repair treatments for roads aims to balance costs, benefits, and road life expectancy. All pavements are damaged by water, traffic weight, freeze/thaw cycles, and sunlight. Each of the following treatments and strategies—reconstruction, structural improvements, capital preventive maintenance, and others used by SJCRC—counters at least one of these pavement-damaging forces.

Reconstruction

Pavement reconstruction treats failing or failed pavements by completely removing the old pavement and base and constructing an entirely new road (Figure 3). Every pavement has to eventually be reconstructed and it is usually done as a last resort after more cost-effective treatments are done, or if the road requires significant changes to road geometry, base, or buried utilities. Compared to the other treatments, which are all improvements of the existing road, reconstruction is the most extensive rehabilitation of the roadway and therefore, also the most expensive per mile and most disruptive to regular traffic patterns. Reconstructed pavement will subsequently require one or more of the previous maintenance treatments to maximize service life and performance. A reconstructed asphalt road lasts approximately 18 years and

Figure 3: Examples of reconstruction treatments—(left) reconstructing a road and (right) road prepared for full-depth repair.

costs $500,000 per mile and a reconstructed sealcoat road last approximately 12 years and costs $100,000 per mile. The following descriptions outline the main reconstruction treatments used by SJCRC.

Ditching (for Unpaved Roads)

Water needs to drain away from any roadway to delay softening of the pavement structure, and proper drainage is critical for unpaved roads where there is no hard surface on top to stop water infiltration into the road surface and base. To improve drainage, new ditches are dug or old ones are cleaned out. Unpaved roads typically need to be re-ditched every 15 years at a cost of $15,000 per mile.

Gravel Overlay (for Unpaved Roads)

Unpaved roads will exhibit gravel loss over time due to traffic, wind, and rain. Gravel on an unpaved road provides a wear surface and contributes to the structure of the entire road. Unpaved roads typically need to be overlaid with four inches of new gravel every 15 years at a cost of $30,000 per mile.

Structural Improvement

Roads requiring structural improvements exhibit alligator cracking and rutting and rated poor in the TAMC scale. Road rutting is evidence that the underlying structure is beginning to fail and it must be either rehabilitated with a structural treatment. Examples of structural improvement treatments include HMA overlay with or without milling, and crush and shape (Figure 4). The following descriptions outline the main structural improvement treatments used by SJCRC.

Figure 4: Examples of structural improvement treatments—(from left) HMA overlay on an unmilled pavement, milling asphalt pavement, and pulverization of a road during a crush-and-shape project.

Hot-mix Asphalt (HMA) Overlay with/without Milling

An HMA overlay is a layer of new asphalt (liquid asphalt and stones) placed on an existing pavement (Figure 4). Depending on the overlay thickness, this treatment can add significant structural strength. This treatment also creates a new wearing surface for traffic and seals the pavement from water, debris, and sunlight damage. An HMA overlay lasts approximately five to ten years and costs $150,000 per mile. The top layer of severely damaged pavement can be removed by the milling, a technique that helps prevent structural problems from being quickly reflected up to the new surface. Milling is also done to keep roads at the same height of curb and gutter that is not being raised or reinstalled in the project. Milling adds $20,000 per mile to the HMA overlay cost.

Crush and Shape

During a crush and shape treatment, the existing pavement and base are pulverized and then the road surface is reshaped to correct imperfections in the road's profile (Figure 4). An additional layer of gravel is often added along with a new wearing surface such as an HMA overlay or chip seal. Additional gravel and an HMA overlay give an increase in the pavements structural capacity. This treatment is usually done on rural roads with severe structural distress; Adding gravel and a wearing surface makes it more prohibitive for urban roads if the curb and gutter is not raised up. Crush and shape treatments last approximately 14 years and cost $280,000 per mile.

Capital Preventive Maintenance

Capital preventive maintenance (CPM) addresses pavement problems of fair-rated roads before the structural integrity of the pavement has been severely impacted. CPM is a planned set of cost-effective treatments applied to an existing roadway that slows further deterioration and that maintains or improves the functional condition of the system without significantly increasing the structural capacity. Examples of such treatments include crack seal, fog seal, chip seal, slurry seal, and microsurface (Figure 5). The purpose of the following CPM treatments is to protect the pavement structure, slow the rate of deterioration, and/or correct pavement surface deficiencies. The following descriptions outline the main CPM treatments used by SJCRC.

Figure 5: Examples of capital preventive maintenance treatments—(from left) crack seal, fog seal, chip seal, and slurry seal/microsurface.

Crack Seal

Water that infiltrates the pavement surface softens the pavement structure and allows traffic loads to cause more damage to the pavement than in normal dry conditions. Crack sealing helps prevent water infiltration by sealing cracks in the pavement with asphalt sealant (Figure 5). SJCRC seals pavement cracks early in the life of the pavement to keep it functioning as strong as it can and for as long as it can. Crack sealing lasts approximately two years and costs $4,000 per lane mile. Even though it does not last very long compared to other treatments, it does not cost very much compared to other treatments. This makes it a very cost effective treatment when SJCRC looks at what crack filling costs per year of the treatment's life.

Fog Seal

Fog sealing sprays a liquid asphalt coating onto the entire pavement surface to fill hairline cracks and prevent damage from sunlight (Figure 5). Fog seals are best for good to very good pavements and last approximately two years at a cost of $4,500 per mile.

Chip Seal

A chip seal, also known as a sealcoat, is a two-part treatment that starts with liquid asphalt sprayed onto the old pavement surface followed by a single layer of small stone chips spread onto the wet liquid asphalt layer (Figure 5). The liquid asphalt seals the pavement from water and debris and holds the stone chips in place, providing a new wearing surface for traffic that can correct friction problems and helping to prevent further surface deterioration. Chip seals are best applied to pavements that are not exhibiting problems with strength, and their purpose is to help preserve that strength. These treatments last approximately five years and cost $23,000 per mile.

Slurry Seal/Microsurface

A slurry seal or microsurface's purpose is to protect existing pavement from being damaged by water and sunlight. The primary ingredients are liquid asphalt (slurry seal) or modified liquid asphalt (microsurface), small stones, water and portland cement applied in a very thin (less than a half an inch) layer (Figure 5). The main difference between a slurry seal and a microsurface is the modified liquid asphalt used in microsurfacing provides different curing and durability properties, which allows microsurfacing to be used for filling pavement ruts. Since the application is very thin, these treatments do not add any strength to the pavement and only serves to protect the pavement's existing strength by sealing the pavement from sunlight and water damage. These treatments work best when applied before cracks are too wide and too numerous. A slurry seal treatment lasts approximately four years and costs $20,000 per lane mile, while a microsurface treatment tends to last for seven years and costs $25,000 per lane mile.

Maintenance Grading (for Unpaved Roads)

Maintenance grading involves regrading an unpaved road to remove isolated potholes, washboarding, and ruts then restoring the compacted crust layer (Figure 6). Crust on an unpaved road is a very tightly compacted surface that sheds water with ease but takes time to be created, so destroying a crusted surface with maintenance grading requires a plan to restore the crust. Maintenance grading often needs to be performed three to five times per year and each grading costs $500 per mile.

Dust Control (for Unpaved Roads)

Dust control typically involves spraying chloride or other chemicals on a gravel surface to reduce dust loss, aggregate loss, and maintenance (Figure 6). This is a relatively short-term fix that helps create a crusted surface. Chlorides work by attracting moisture from the air and existing gravel. This fix is not effective if the surface is too dry or heavy rain is imminent, so timing is very important. Dust control is done one to two times per year, with township participation, and each application costs $750 per mile.

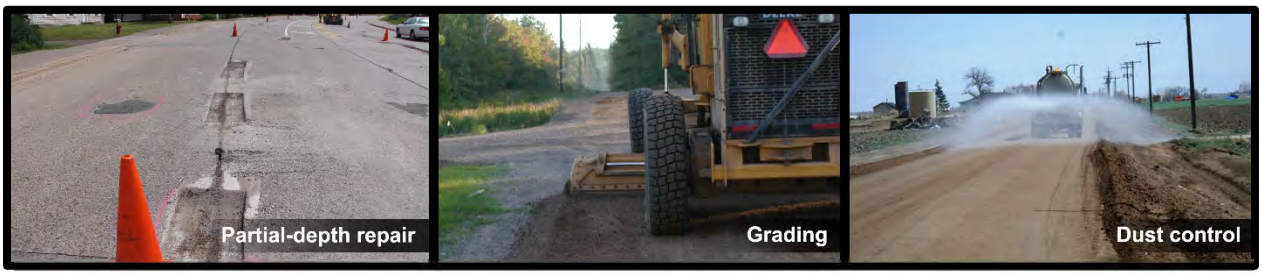


Figure 6: Examples of capital preventive maintenance treatments, cont'd—(from left) concrete road prepared for partial-depth repair, gravel road undergoing maintenance grading, and gravel road receiving dust control application (dust control photo courtesy of Weld County, Colorado, weldgov.com).

Maintenance

Maintenance is the most cost-effective strategy for managing road infrastructure and prevents good and fair roads from reaching the poor category, which require costly rehabilitation and reconstruction treatments to create a year of service life. It is most effective to spend money on routine maintenance and CPM treatments, first; then, when all maintenance project candidates are treated, reconstruction and rehabilitation can be performed as money is available. This strategy is called a "mix-of-fixes" approach to managing pavements.

1. PAVEMENT ASSETS

Building a mile of new road can cost over $1 million due to the large volume of materials and equipment that are necessary. The high cost of constructing road assets underlines the critical nature of properly managing and maintaining the investments made in this vital infrastructure. The specific needs of every mile of road within an agency's overall road network is a complex assessment, especially when considering rapidly changing conditions and the varying requisites of road users; understanding each road-mile's needs is an essential duty of the road-owning agency.

In Michigan, many different governmental units (or agencies) own and maintain roads, so it can be difficult for the public to understand who is responsible for items such as planning and funding construction projects, [patching] repairs, traffic control, safety, and winter maintenance for any given road. MDOT is responsible for state trunkline roads, which are typically named with "M", "I", or "US" designations regardless of their geographic location in Michigan. Cities and villages are typically responsible for all public roads within their geographic boundary with the exception of the previously mentioned state trunkline roads managed by MDOT. County road commissions (or departments) are typically responsible for all public roads within the county's geographic boundary, with the exception of those managed by cities, villages, and MDOT.

In cases where non-trunkline roads fall along jurisdictional borders, local and intergovernmental agreements dictate ownership and maintenance responsibility. Quite frequently, roads owned by one agency may be maintained by another agency because of geographic features that make it more cost effective for a neighboring agency to maintain the road instead of the actual road owner. Other times, road-owning agencies may mutually agree to coordinate maintenance activities in order to create economies of scale and take advantage of those efficiencies.

The SJCRC is responsible for a total of 1020.354 centerline of public roads, as shown in Figure 7.

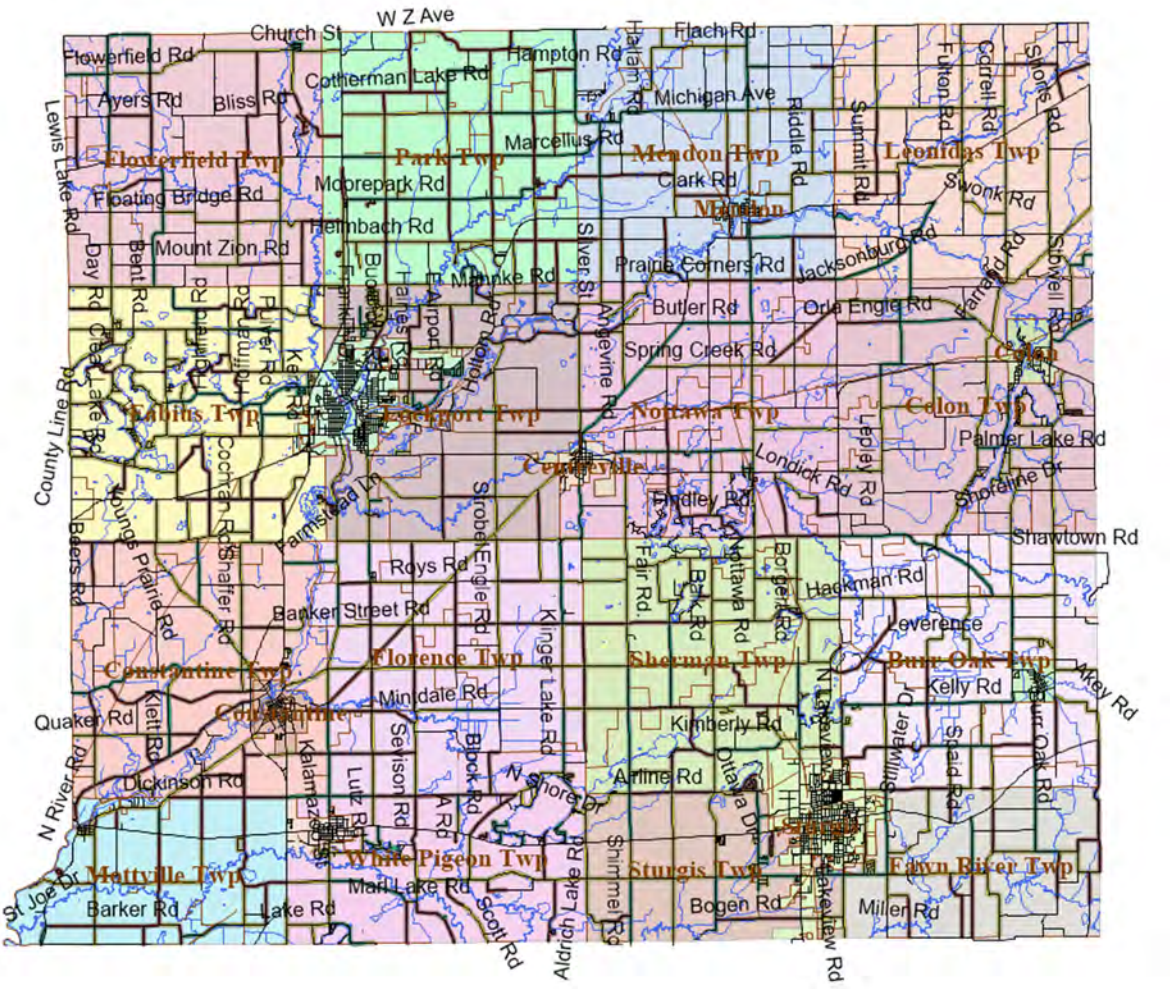


Figure 7: Map showing location of SJCRC's paved roads (i.e., those managed by SJCRC) and their current condition for paved roads with green for good (i.e., PASER 10, 9, 8), yellow for fair (i.e., PASER 7, 6, 5), and red for poor (i.e., PASER 4, 3, 2, 1).

Inventory

Michigan Public Act 51 of 1951 (PA 51), which defines how funds from the Michigan Transportation Fund (MTF) are distributed to and spent by road-owning agencies, classifies roads owned by SJCRC as either county primary or county local roads. State statute prioritizes expenditures on the county primary road network.

Of the 1020.354 centerline of public roads owned and/or managed by SJCRC, Approximately 82% of all County Primary roads are classified as federal aid eligible, which allows them to receive federal funding for their maintenance and construction. Only 1% of County Local roads are considered federal aid eligible, which means state and local funds must be used to manage these roads.

Figure 8 illustrates the percentage of roads owned by SJCRC that are classified as county primary and county local roads. Figure 9 illustrates this breakdown of these road networks by township boundary within SJCRC's jurisdiction.

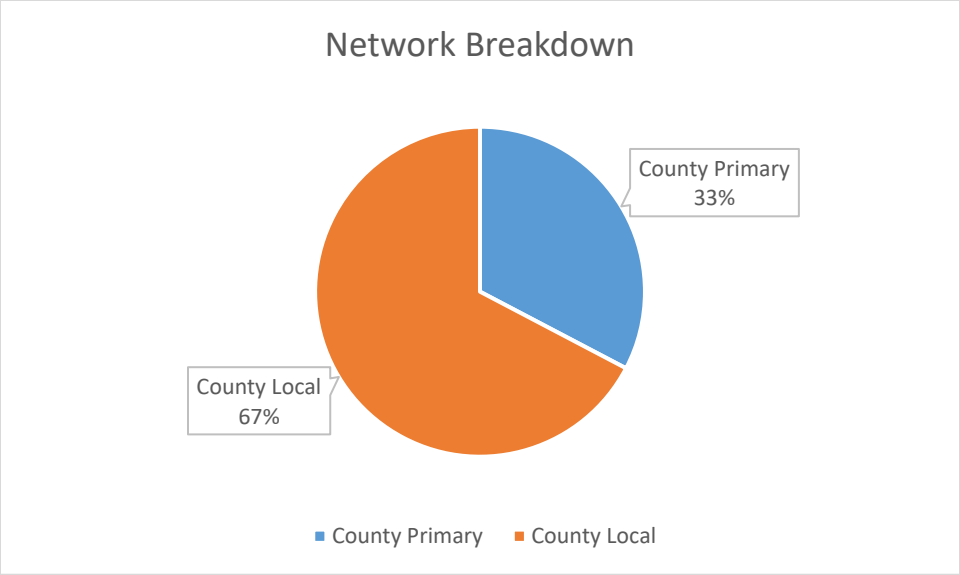


Figure 8: Percentage of county primary and county local roads for SJCRC.

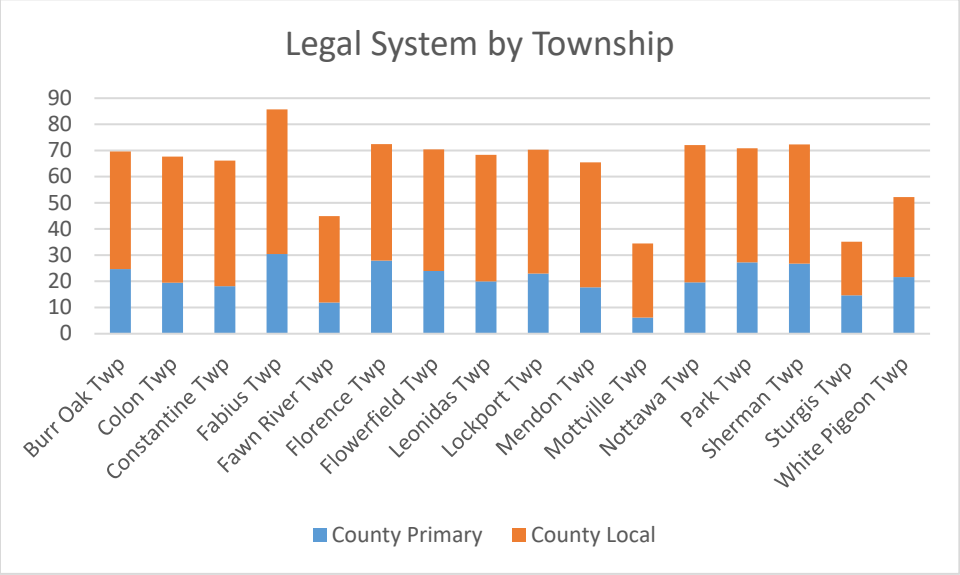


Figure 9: county primary and county local roads by township for SJCRC's jurisdiction.

SJCRC manages 0 miles of roads that are part of the National Highway System (NHS)—in other words, those roads that are critical to the nation's economy, defense, and mobility—and monitors and maintains their condition. The NHS is subject to special rules and regulations and has its own performance metrics dictated by the FHWA. While most NHS roads in Michigan are managed by MDOT, SJCRC manages a percentage of those roads located in its jurisdiction, as shown in Figure 10.

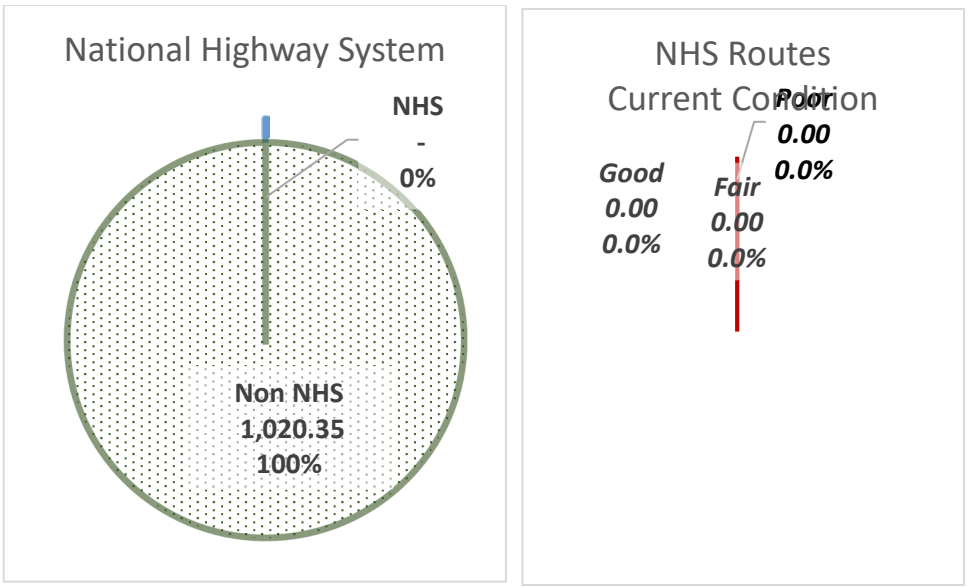


Figure 10: Miles of roads managed by SJCRC that are part of the National Highway System and condition.

SJCRC also owns and manages 181.799 miles of unpaved roads.

Types

SJCRC has multiple types of pavements in its jurisdiction, including: asphalt, sealcoat, concrete, and undefined; it also has unpaved roads (i.e, gravel and/or earth). Factors influencing pavement type include cost of construction, cost of maintenance, frequency of maintenance, type of maintenance, asset life, and road user experience. More information on pavement types is available in the Introduction's Pavement Primer.

Figure 11 illustrates the percentage of various pavement types that SJCRC has in its network. Figure 12 shows the pavement type by Township boundary for SJCRC's jurisdiction.

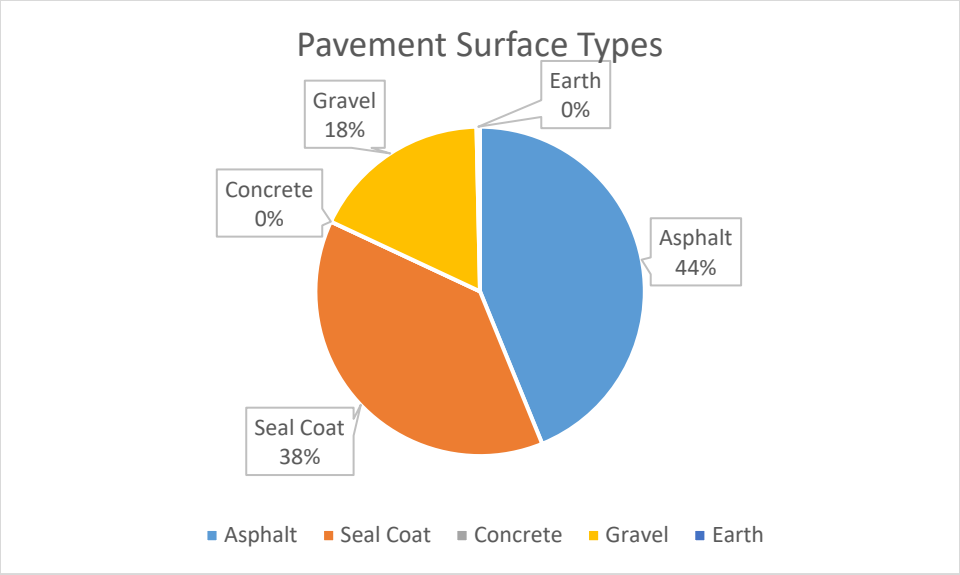


Figure 11: Pavement type by percentage maintained by SJCRC Undefined pavements have not been inventoried in SJCRC's asset management system to date, but will be included as data becomes available.

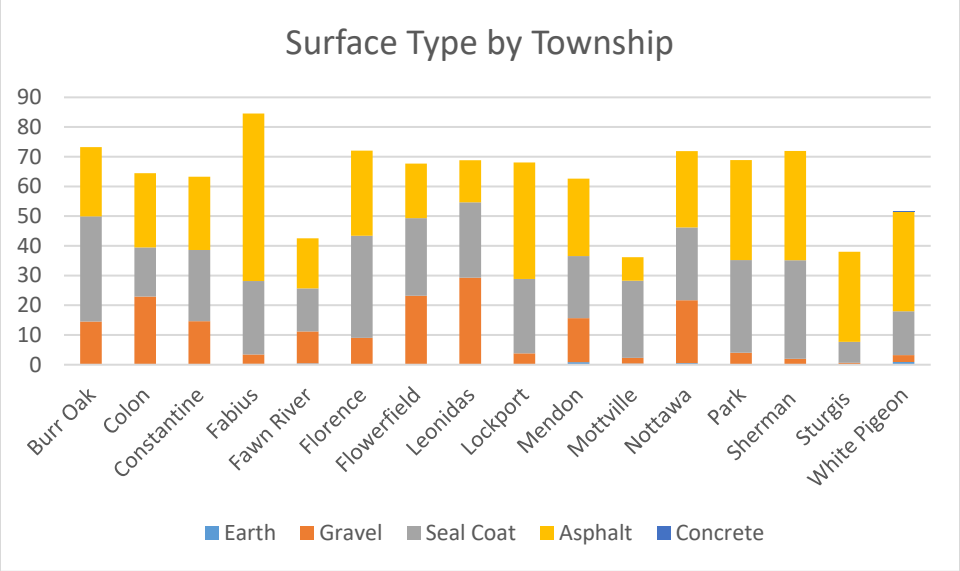


Figure 12: Pavement type by township within SJCRC's jurisdiction. Undefined pavements have not been inventoried in SJCRC's asset management system to date, but will be included as data becomes available.

Locations

Locations and sizes of each asset can be found in SJCRC's Roadsoft database. For more detail, please refer to the agency contact listed in the *Introduction* of this pavement asset management plan.

Condition

The road characteristic that road users most readily notice is pavement condition. Pavement condition is a major factor in determining the most cost-effective treatment—that is, routine maintenance, capital preventive maintenance, or structural improvement—for a given section of pavement. SJCRC uses pavement condition and age to anticipate when a specific section of pavement will be a potential candidate for preventive maintenance. Pavement condition data enables SJCRC to evaluate the benefits of preventive maintenance projects and to identify the most cost-effective use of road construction and maintenance dollars. Historic pavement condition data can be used to predict future road conditions based on budget constraints and to determine if a road network's condition will improve, stay the same, or degrade at the current or planned investment level. This analysis helps to determine how much additional funding is necessary to meet a network's condition improvement goals. More detail on this topic is included in the Introduction's *Pavement Primer*.

Paved Roads

SJCRC is committed to monitoring the condition of its road network and using pavement condition data to drive cost-effective decision-making and preservation of valuable road assets. SJCRC uses the Pavement Surface Evaluation and Rating (PASER) system, which has been adopted by the TAMC for measuring statewide pavement conditions, to assess its paved roads. The PASER system provides a simple, efficient, and consistent method for evaluating road condition through visual inspection. More information regarding the PASER system can be found in the Introduction's Pavement Primer.

SJCRC collects 100 percent of its PASER data every two years on all federal-aid-eligible roads in Michigan. In addition, SJCRC collects 50 percent of its paved non-federal-aid-eligible network using its own staff and resources.

SJCRC's 2026 paved county primary road network has 24 percent of roads in the TAMC good condition category, 64 percent in fair, and 12 percent in poor (Figure 13A). The paved county local road network has 14 percent in good, 44 percent in fair, and 42 percent in poor (Figure 13B).

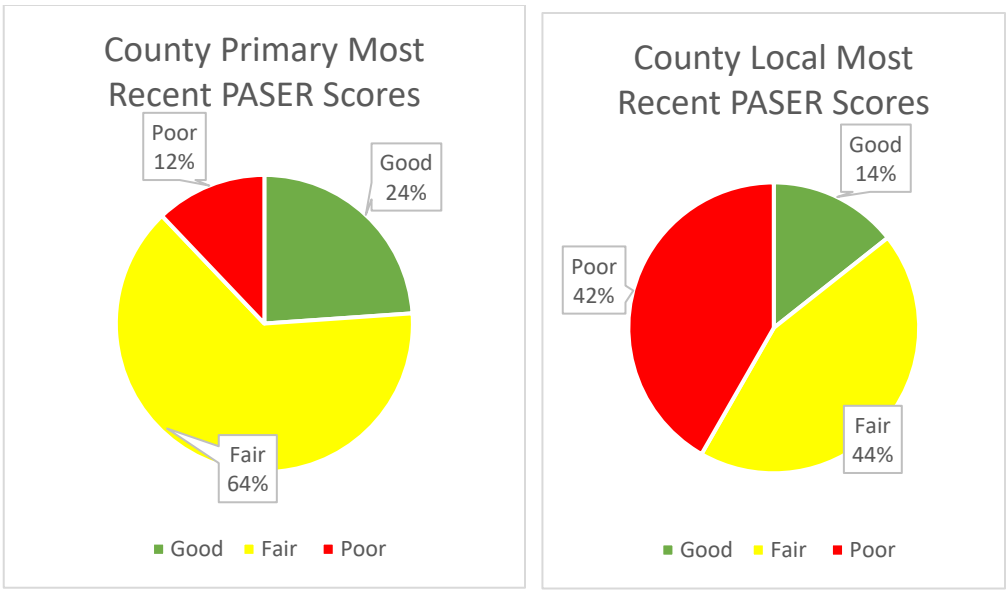


Figure 13: (A) Left: SJCRC paved county primary road network conditions by percentage of good, fair, or poor, and (B) Right: paved county local road network conditions by percentage of good, fair, or poor

In comparison, the statewide paved county primary road network has 26.8 percent of roads in the TAMC good condition category, 38.2 percent in fair, and 35.0 percent in poor (Figure 14A). The statewide paved county local road network has 19.9 percent in good, 34.8 percent in fair, and 45.3 percent in poor (Figure 14B). Comparing Figure 13A and Figure 14A shows that SJCRC's paved county primary road network is the same than similarly-classified roads in the rest of the state, while Figure 13B and Figure 14B show that SJCRC's paved county local road network is worse than similarly-classified roads in the rest of the state. Other road condition graphs can be viewed on the TAMC pavement condition dashboard at: http://www.mcgi.state.mi.us/mitrp/Data/PaserDashboard.aspx.

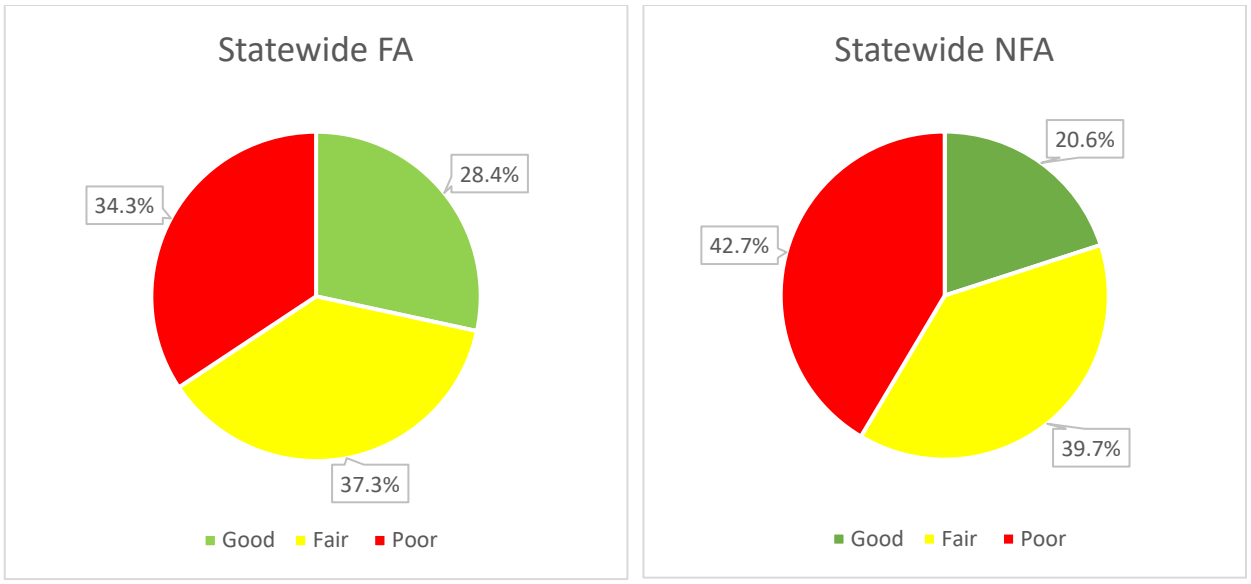


Figure 14: (A) Left: Statewide paved county primary road network conditions by percentage of good, fair, or poor, and (B) Right: paved county local road network conditions by percentage of good, fair, or poor

The St. Joseph County Road Commission differs from the majority of similar sized road commissions for a couple reasons. The. St Joseph County Road Commission has a very high percentage of Local Roads that are hard surfaced and with a limited budget, there is not enough money to continually get to every road on a rotation. SJCRC also has a large amount of road which were built on sealcoat and not an asphalt surface. These surface types do not last as long as asphalt which in itself creates a maintenance issue.

Figure 15 and Figure 16 show the number of miles for SJCRC's roads with PASER scores expressed in TAMC definition categories for the paved county primary road network (Figure 15) and the paved county local road network (Figure 16). SJCRC considers road miles on the transition line between good and fair (PASER 8) and the transition line between fair and poor (PASER 5) as representing parts of the road network where there is a risk of losing the opportunity to apply less expensive treatments that gain significant improvements in service life.

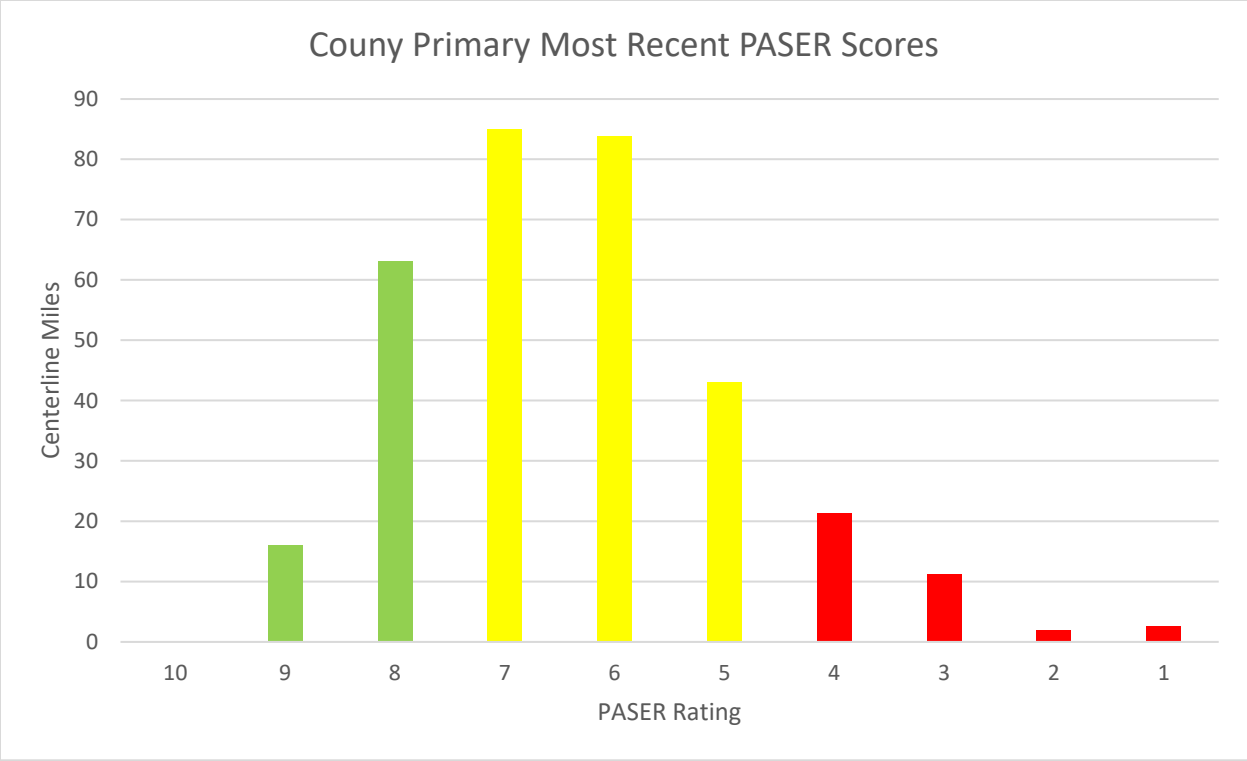


Figure 15: SJCRC paved county primary road network conditions. Bar graph colors correspond to good/fair/poor TAMC designations.

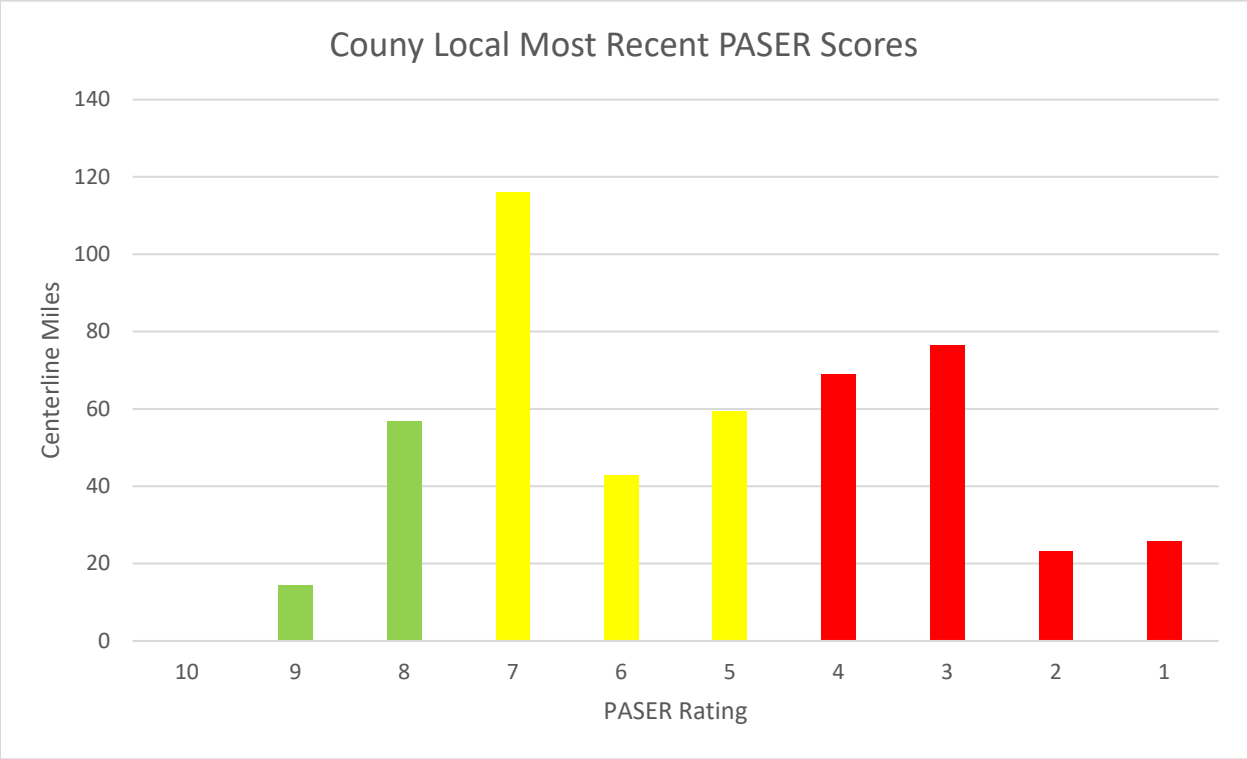


Figure 16: SJCRC paved county local network condition by PASER rating. Bar graph colors correspond to good/fair/poor TAMC designations

Figure 18 provides a map illustrating the geographic location of paved roads and their respective PASER condition. An online version of the most recent PASER data is located at https://www.mcgi.state.mi.us/tamcMap/.

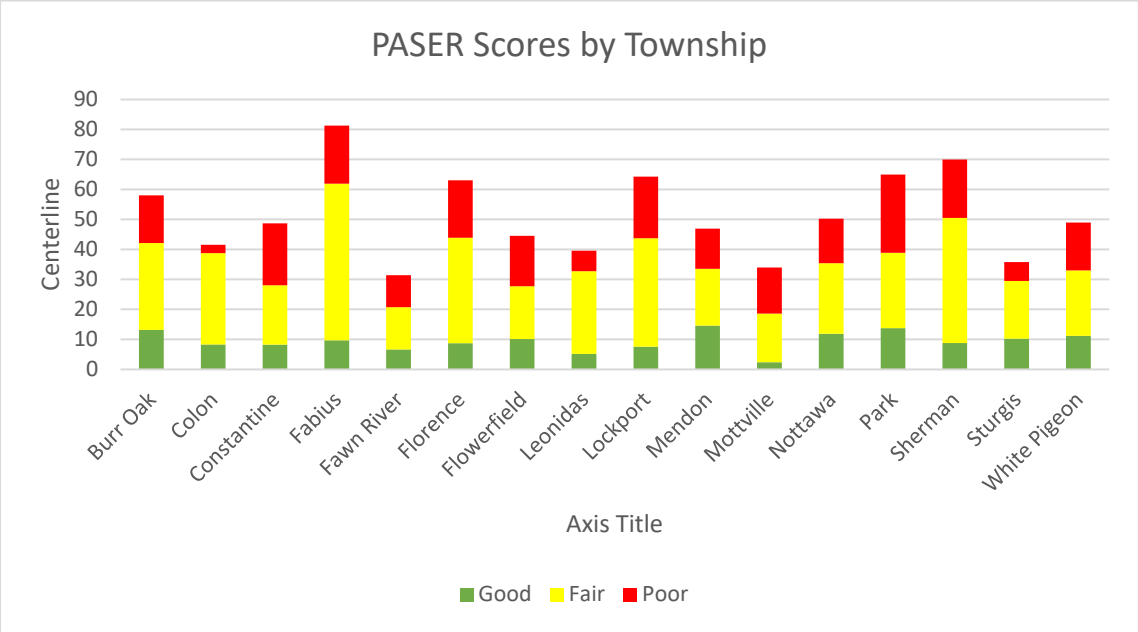


Figure 17: Number of miles of paved road in each township divided in categories of good (PASER 10, 9, 8), fair (PASER 7, 6, 5), and poor (PASER 4, 3, 2, 1).

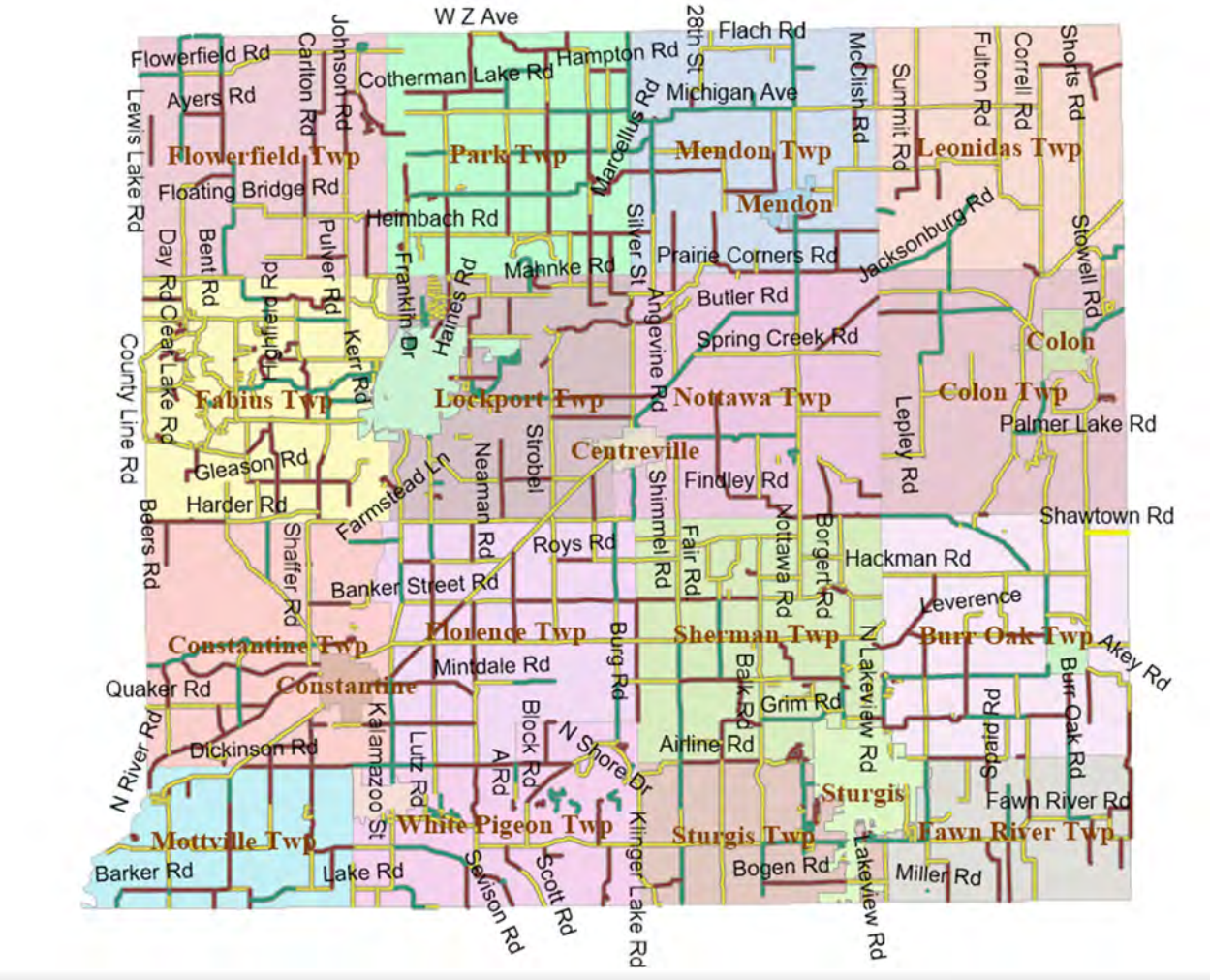


Figure 18: Map of the current paved road condition in good (PASER 10, 9, 8) shown in green, fair (PASER 7, 6, 5) shown in yellow, and poor (PASER 4, 3, 2, 1) shown in red. Only Roads owned by SJCRC are shown.

The distribution on the PASER spectrum between the local road system and the primary road system is very noticeable. The SJCRC spends 2/3 of its MTF funds on approximately 1/3 of the road system leading to a higher PASER value then on the local road system. 81% of the local road system is hard surfaced, which leads to more expensive repairs and maintenance with a smaller budget than the primary road system. To attempt to cover the disparity in the funding the SJCRC has set up a township match setting aside $1,500,000 to match with township contributions.

Historically, the overall quality of SJCRC's paved county primary roads have been increasing as can be observed in Figure 19.

Comparing SJCRC's paved county primary road condition trends illustrated in Figure 19 with overall statewide condition trends for similarly-classified roads, which are illustrated in Figure 20, shows a different trend locally as in the rest of the state.

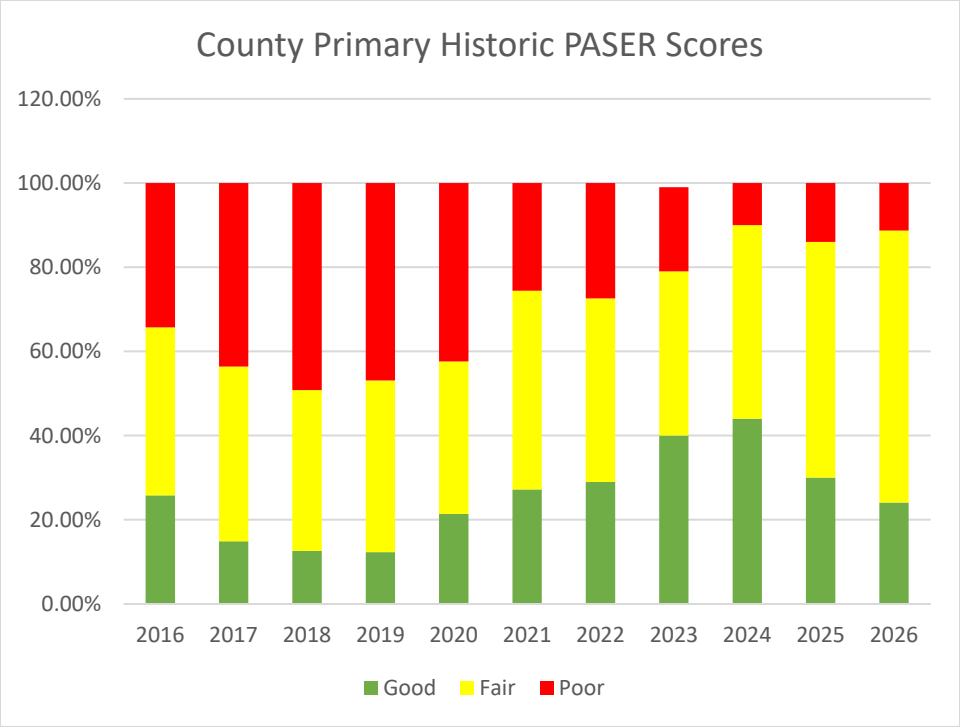


Figure 19: Historical SJCRC paved county primary road network condition trend

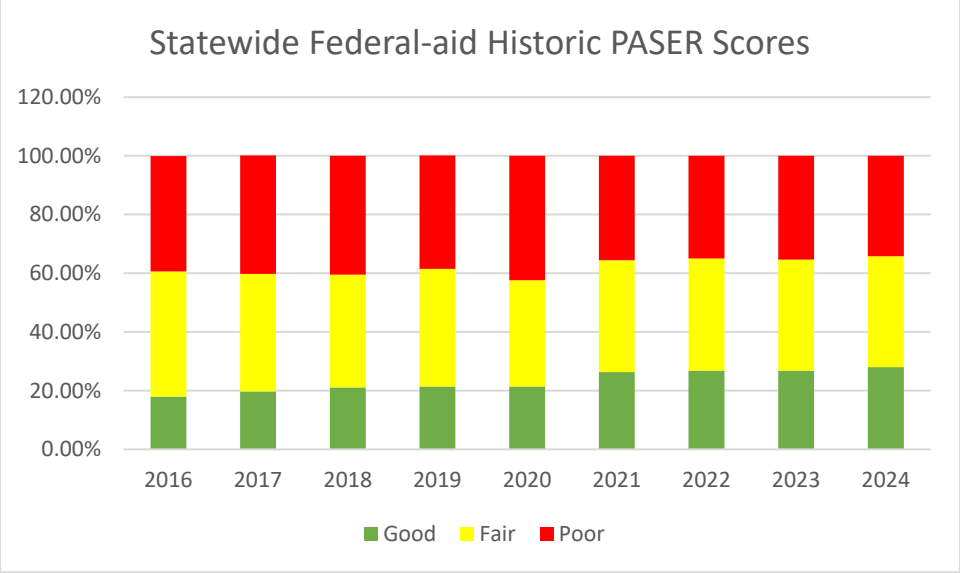


Figure 20: Historical statewide county primary road network condition trend

Historically, the overall quality of SJCRC's paved county local roads have been staying the same than the paved county primary road network because they lack a source of state and federal funding and therefore must be supported locally. Figure 21 illustrates the condition of the paved county local road network in SJCRC while Figure 22 illustrates these conditions statewide.

Comparing SJCRC's paved county local road condition trends illustrated in Figure 21 with overall statewide condition trends for all paved county local roads illustrated in Figure 22 indicates a similar trend locally as in the rest of the state. The year-to-year variation in the paved county local road network is likely due to the fact that only a portion of the network is collected each year, both locally and statewide. This variation is likely a result of reporting bias since a representative sample of roads is not collected each year.

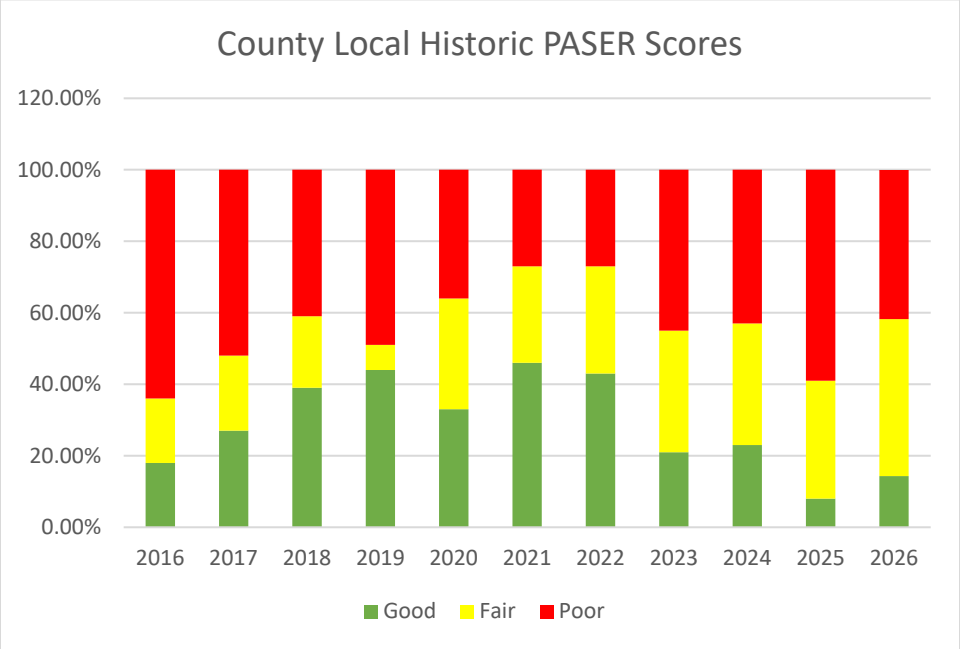


Figure 21: Historical SJCRC paved county local road network condition trend

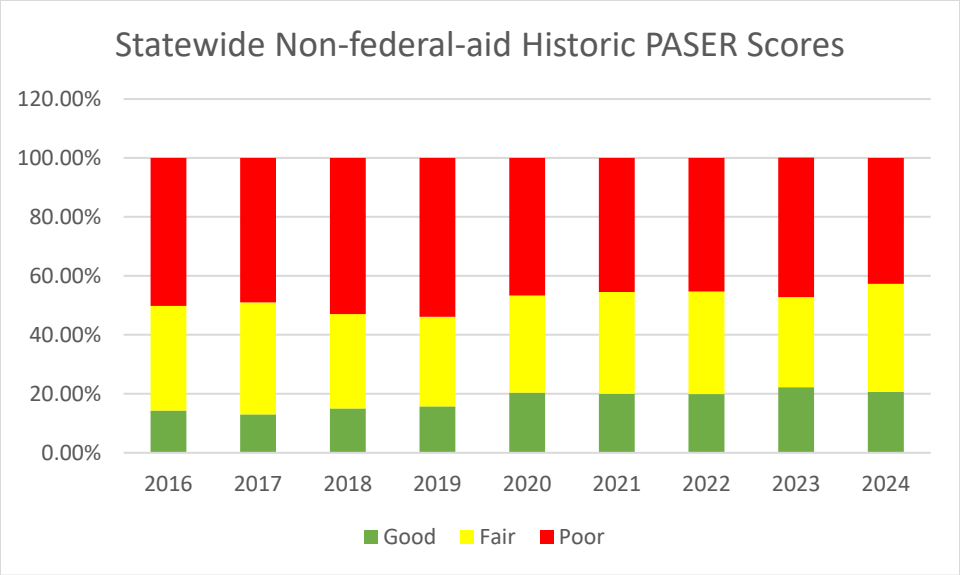


Figure 22: Historical statewide paved county local road network condition trend

Unpaved Roads

The condition of unpaved roads can be rapidly changing, which makes it difficult to obtain a consistent surface condition rating over the course of weeks or even days. The TAMC adopted the Inventory Based Rating (IBR) System™ for rating unpaved roads, and SJCRC uses the IBR System™ for rating its unpaved roads. More information regarding the IBR System™ can be found in Introduction's Pavement Primer.

Unpaved roads are a new rating system that the SJCRC is going to incorporate. Our goal is to rate 1/2 of the system along with our normal local rating.

Figure 23 shows the percentage of unpaved roads in each IBR number ranges of 10, 9, and 8; 7, 6, and 5; and 4, 3, 2, and 1, for all roads. Figure 24 illustrates the miles of unpaved roads in IBR number ranges of 10, 9, and 8; 7, 6, and 5; and 4, 3, 2, and 1, for each township.

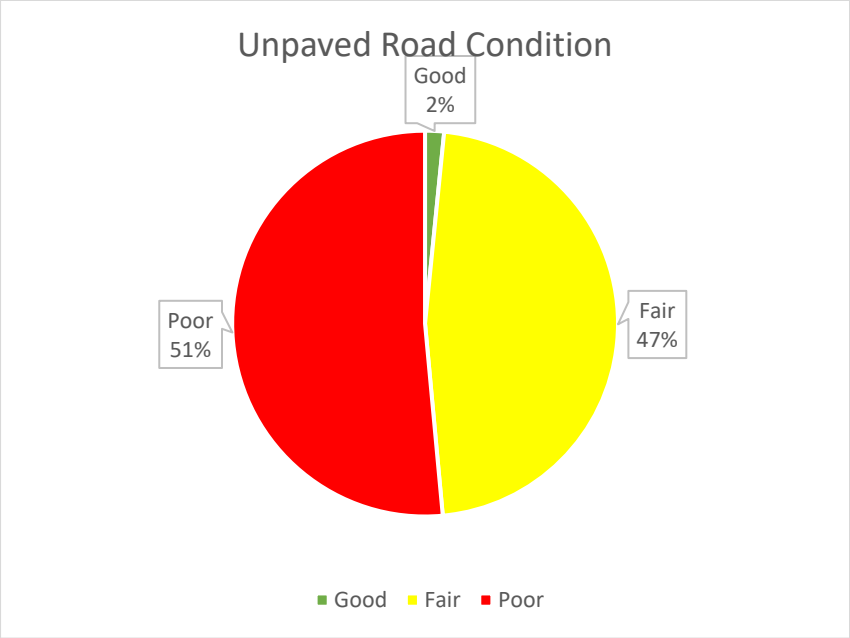


Figure 23: SJCRC's unpaved road network condition by percentage of roads with IBR numbers of 10, 9, and 8; roads with IBR numbers of 7, 6, and 5; and IBR numbers of 4, 3, 2, and 1.

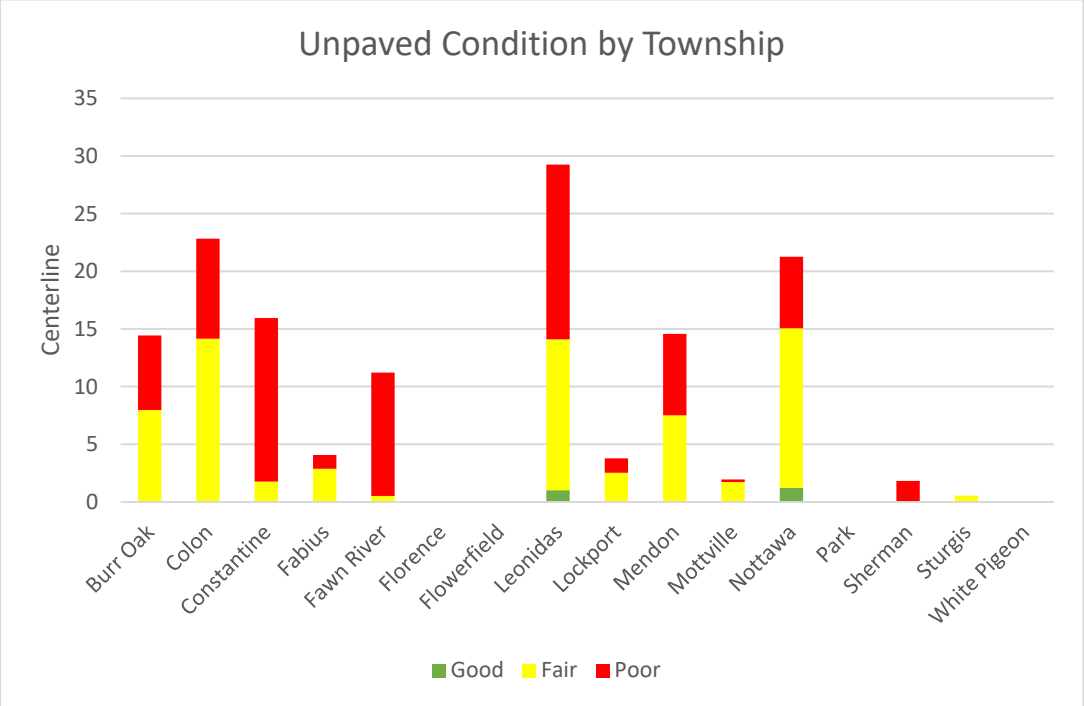


Figure 24: Number of miles of unpaved road in each township divided in categories of roads with IBR numbers of 10, 9, and 8; IBR numbers of 7, 6, and 5; and IBR numbers of 4, 3, 2, and 1.

Figure 25 is a map illustrating the geographic location of unpaved roads and the assessment of the IBR elements, respectively: surface width, drainage adequecy, and structural adequecy.

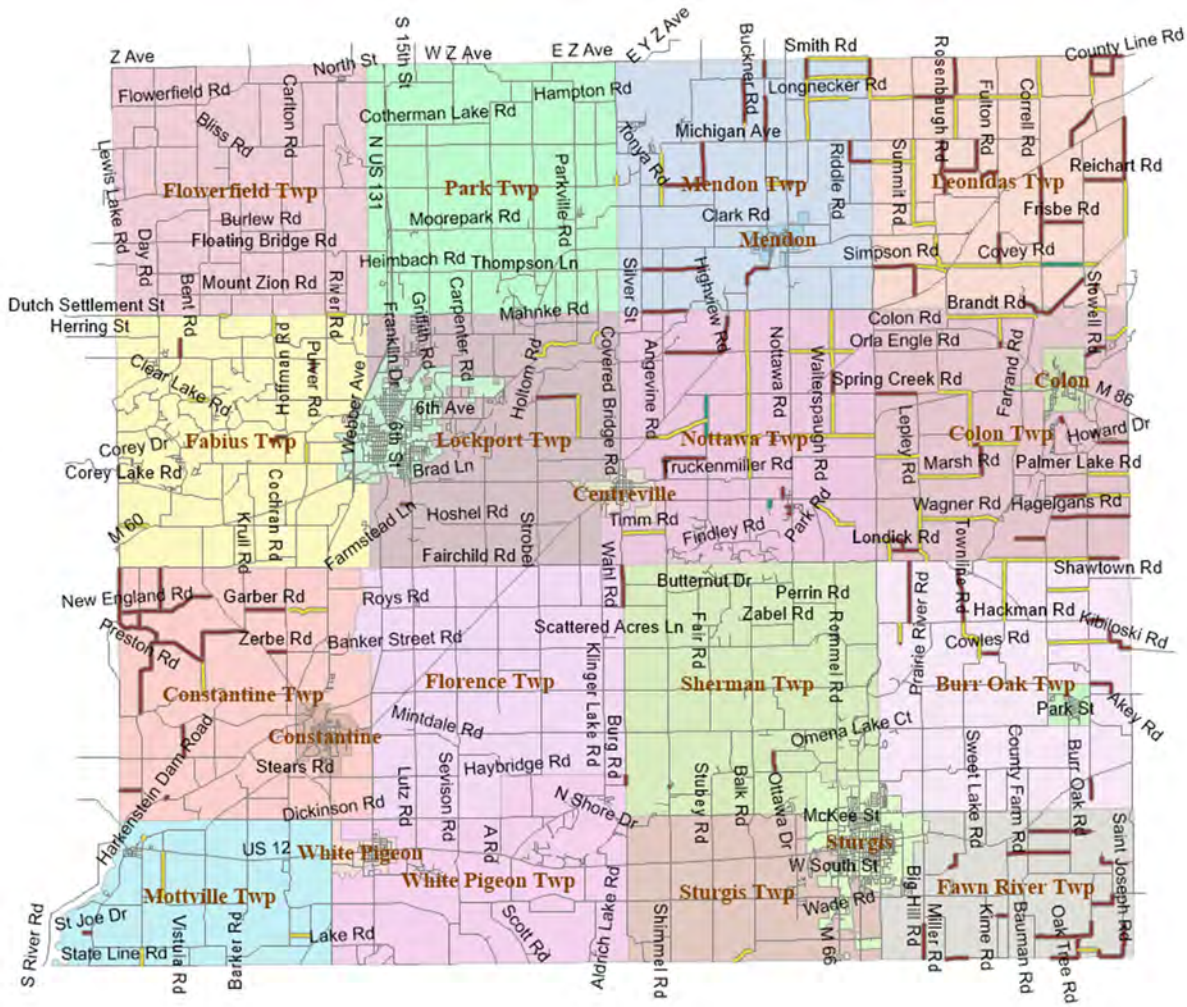


Figure 25: Map of County Gravel Roads

Goals

Goals help set expectations to how pavement conditions will change in the future. Pavement condition changes are influenced by water infiltration, soil conditions, sunlight exposure, traffic loading, and repair work performed. SJCRC is not able to control any of these factors fully due to seasonal weather changes, traffic pattern changes, and its limited budget. In spite of the uncontrollable variables, it is still important to set realistic network condition goals that efficiently use budget resources to build and maintain roads meeting taxpayer expectations. An assessment of the progress toward these goals is provided in the *1. Pavement Assets*: *Gap Analysis* section of this plan.

Goals for Paved County Primary Roads

The overall goal for SJCRC's paved county primary road network is to maintain or improve road conditions network-wide at 2026 levels. The baseline condition for this goal is illustrated in Figure 26.

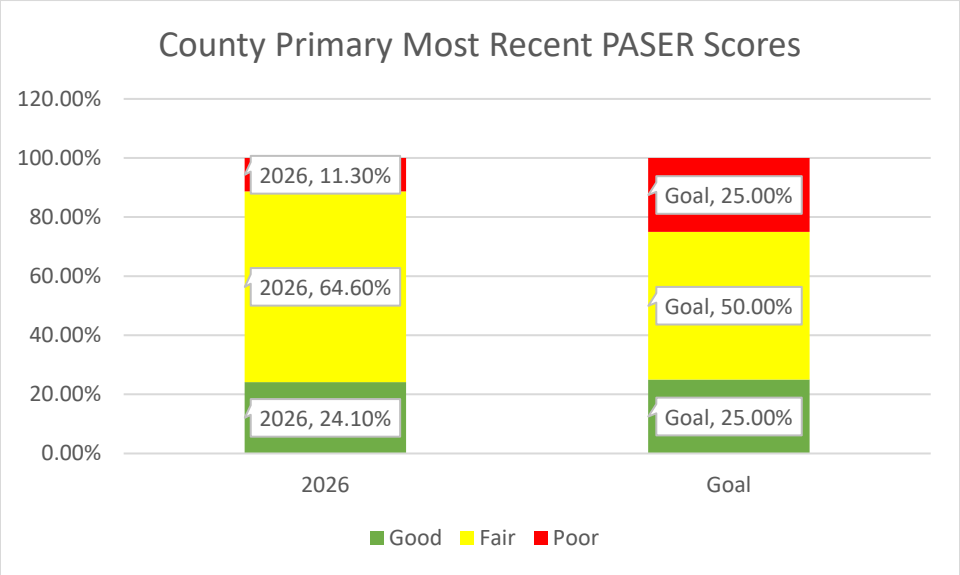


Figure 26: SJCRC's 2022 county primary road network condition by percentage of good/fair/poor

SJCRC's network-level pavement condition strategy for paved county primary roads is:

1. Prevent its good and fair (PASER 10 - 5) paved county primary from becoming poor (PASER 4 - 1).
2. Move 20 percent of paved county primary roads out of the poor category.

Goals for Paved County Local Roads

The overall goal for SJCRC's paved county local road network is to maintain or improve road conditions network-wide at 2026 levels. The baseline condition for this goal is illustrated in Figure 27.

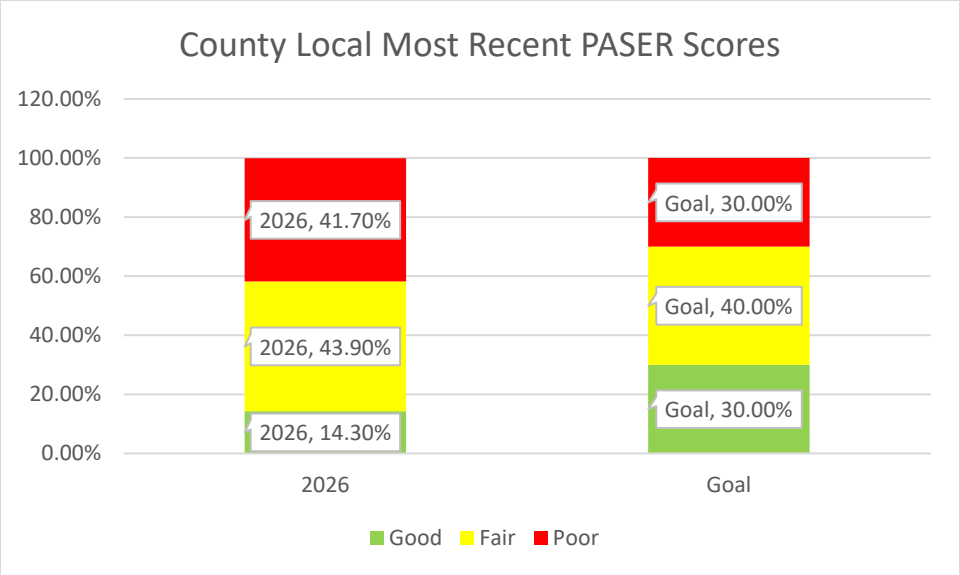


Figure 27: SJCRC 2022 paved county local road network condition by percentage of good/fair/poor

SJCRC's network-level pavement condition strategy for paved county local roads is:

1. Prevent its good and fair (PASER 10 - 5) paved county local roads from becoming poor (PASER 4 - 1).
2. Move 5 percent of paved county local roads out of the poor category.

Goals for Unpaved Roads

The overall goal for SJCRC's unpaved road network is to maintain or improve road conditions network-wide at 2026 levels. The baseline condition for this goal is illustrated in Figure 28.

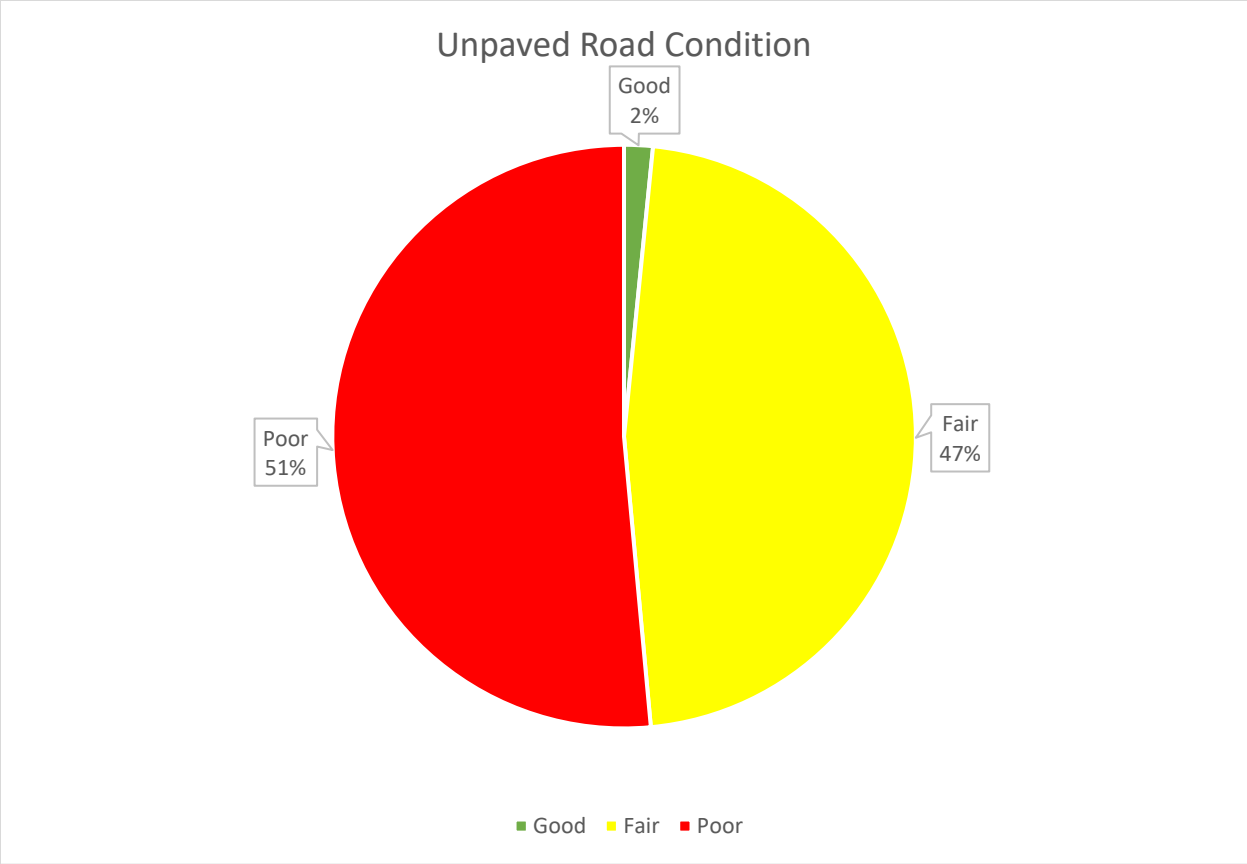


Figure 28: SJCRC's 2022 unpaved road network condition by percentage of good/fair/poor

Our year-round unpaved roads will be maintained at their current structural adequacy assessments and current drainage adequacy assessments for roads where these two IBR elements are assessed as good or fair. Our Goal is to set up and maintain an IBR rating system.

Modelled Trends

Roads age and deteriorate just like any other asset. All pavements are damaged by water, traffic weight, freeze/thaw cycles, sunlight, and traffic weight. To offset natural deterioration and normal wear-and-tear on the road, SJCRC must complete treatment projects that either protect and/or add life to its pavements. The year-end condition of the whole network depends upon changes or preservation of individual road section condition that preservation treatments have affected.

SJCRC uses many types of repair treatments for its roads, each selected to balance costs, benefits, and road life expectancy. When agency trends are modelled, any gap between goals and accomplishable work becomes evident. Financial resources influence how much work can be accomplished across the network within agency budget and what treatments and strategies can be afforded; a full discussion of SJCRC's financial resources can be found in the *5. Financial Resources* section.

Treatments and strategies that counter pavement-damaging forces include reconstruction, structural improvement, capital preventive maintenance, innovative treatments, and maintenance. For a complete discussion on the pavement treatment tools, refer to the *1. Introduction*'s *Pavement Primer*.

Correlating with each PASER score are specific types of treatments best performed either to protect the pavement (CPM) or to add strength back into the pavement (structural improvement) (Table 1). MDOT provides guidance regarding when a specific pavement may be a candidate for a particular treatment. These identified PASER scores "trigger" the timing of projects appropriately to direct the right pavement fix at the right time, thereby providing the best chance for a successful project. The information provided in Table 1 is a guide for identifying potential projects; however, this table should not be the sole criteria for pavement treatment selection. Other information such as future development, traffic volume, utility projects, and budget plays a role in project selection. This table should not be a substitute for engineering judgement. Other factors that SJCRC uses for the selection of a project are a rotation schedule that has been set up for sealcoating. The primary road system is a 6-year rotation for sealcoating and the local road system is a 7-year rotation for sealcoating. Any project that was paved is to be sealcoated the following year to protect the initial investment of the HMA.

Table 1: Service Life Extension (in Years) for Pavement Types Gained by Fix Type[1]

Fix Type	Life Extension (in years)*			PASER
	Flexible	Composite	Rigid	
HMA crack treatment	1-3	1-3	N/A	6-7
Overband crack filling	1-2	1-2	N/A	6-7
One course non-structural HMA overlay	5-7	4-7	N/A	4-5****
Mill and one course non-structural HMA overlay	5-7	4-7	N/A	3-5
Single course chip seal	3-6	N/A	N/A	5-7†
Double chip seal	4-7	3-6	N/A	5-7†
Single course microsurface	3-5	**	N/A	5-6
Multiple course microsurface	4-6	**	N/A	4-6****
Ultra-thin HMA overlay	3-6	3-6	N/A	4-6****
Paver placed surface seal	4-6	**	N/A	5-7
Full-depth concrete repair	N/A	N/A	3-10	4-5***
Concrete joint resealing	N/A	N/A	1-3	5-8
Concrete spall repair	N/A	N/A	1-3	5-7
Concrete crack sealing	N/A	N/A	1-3	4-7
Diamond grinding	N/A	N/A	3-5	4-6
Dowel bar retrofit	N/A	N/A	2-3	3-5***
Longitudinal HMA wedge/scratch coat with surface treatment	3-7	N/A	N/A	3-5****
Flexible patching	**	**	N/A	N/A
Mastic joint repair	1-3	1-3	N/A	4-7
Cape seal	4-7	4-7	N/A	4-7
Flexible interlayer “A”	4-7	4-7	N/A	4-7
Flexible interlayer “B” (SAMI)	4-7	4-7	N/A	3-7
Flexible interlayer “C”	4-7	4-7	N/A	3-7
Fiber reinforced flexible membrane	4-7	4-7	N/A	3-7
Fog seal	**	**	N/A	7-10
GSB 88	**	**	N/A	7-10
Mastic surface treatment	**	**	N/A	7-10
Scrub seal	**	**	N/A	4-8

* The time range is the expected life extending benefit given to the pavement, not the anticipated longevity of the treatment.

** Data is not available to quantify the life extension.

*** The concrete slabs must be in fair to good condition.

**** Can be used on a pavement with a PASER equal to 3 when the sole reason for rating is rutting or severe raveling of the surface asphalt layer.

† For PASER 4 or less providing structural soundness exists and that additional pre-treatment will be required for example, wedging, bar seals, spot double chip seals, injection spray patching or other pre-treatments.

[1] Part of Appendix D-1 from *MDOT Local Agency Programs Guidelines for Geometrics on Local Agency Projects* 2017 Edition Approved Preventive Maintenance Treatments

Roadsoft Pavement Condition Forecast to Forecast Future Trends

SJCRC uses Roadsoft, an asset management software suite, to manage road- and bridge-related infrastructure. Roadsoft is developed by Michigan Technological University and is available for Michigan local agencies at no cost to them. Roadsoft uses pavement condition data to drive network-level deterioration models that forecast future road conditions based on planned construction and maintenance work. A screenshot of Roadsoft's pavement condition model and the associated output is shown in Figure 29.

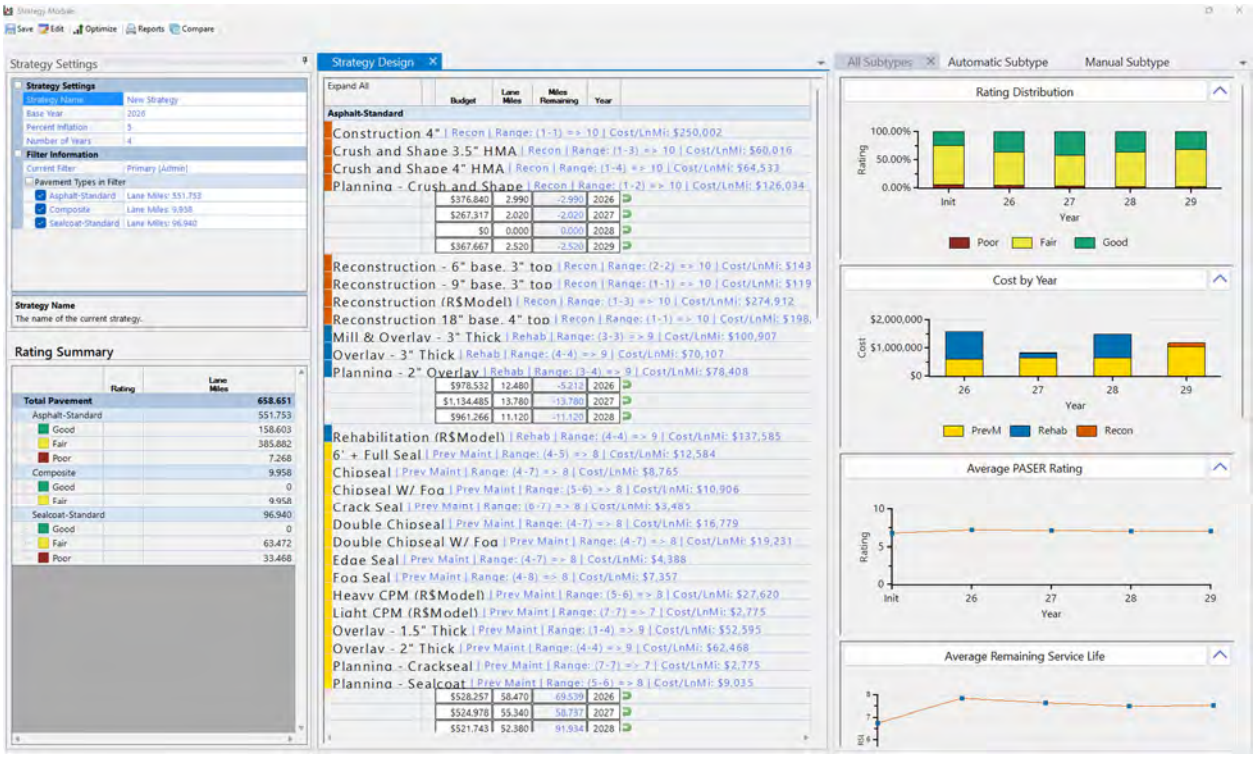


Figure 29: Pavement condition forecast model in the software program Roadsoft.

Paved County Primary Roads

Table illustrates the network-level model inputs for Roadsoft on the paved county primary road network. Other pavement types in this network were neglected due to their small numbers relative to HMA pavements. The treatments outlined in Table are the average treatment volume of planned projects scheduled to be completed in 2023-2026. See Appendix A of this plan for details on planned projects. Full model inputs and outputs are included in Appendix D.

Table 2: Roadsoft Modelled Trends, Planned Projects, and Gap Analysis for Road Assets—Modelled Trends: Roadsoft Annual Work Program for the Paved County Primary Road Network Forecast

Treatment Name	Annual Miles of Treatment	Years of Life	Trigger-Reset
Crack Seal	20	1	7–7
Chip Seal	55	5	5, 6-8
Overlay	16	10	3, 4-9
Reconstruction	2.5	18	1, 2, 3-10
[Treatment 5]			
[Treatment 6]			
[Treatment 7]			
[Treatment 8]			

Results from the Roadsoft network condition model for the county primary roads are shown in Figure 30. The Roadsoft network analysis of SJCRC's planned projects from its currently-available budget does allow SJCRC to reach its pavement condition goals given the projects planned for the next three years.

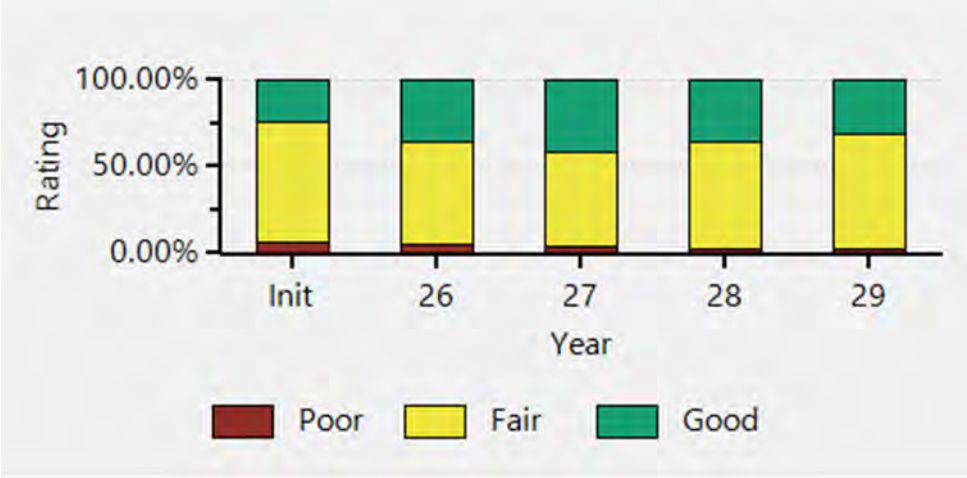


Figure 30: Forecast good/fair/poor changes to SJCRC network condition from planned projects on the county primary road network.

The condition of the primary road system in St. Joseph county has been getting better. This is because we have incorporated a rotation of sealcoating along with we are currently spending down a fund balance that we have built up over the past couple of years.

Paved County Local Road

A screenshot of Roadsoft's pavement condition model and the associated output is shown in Figure 31.

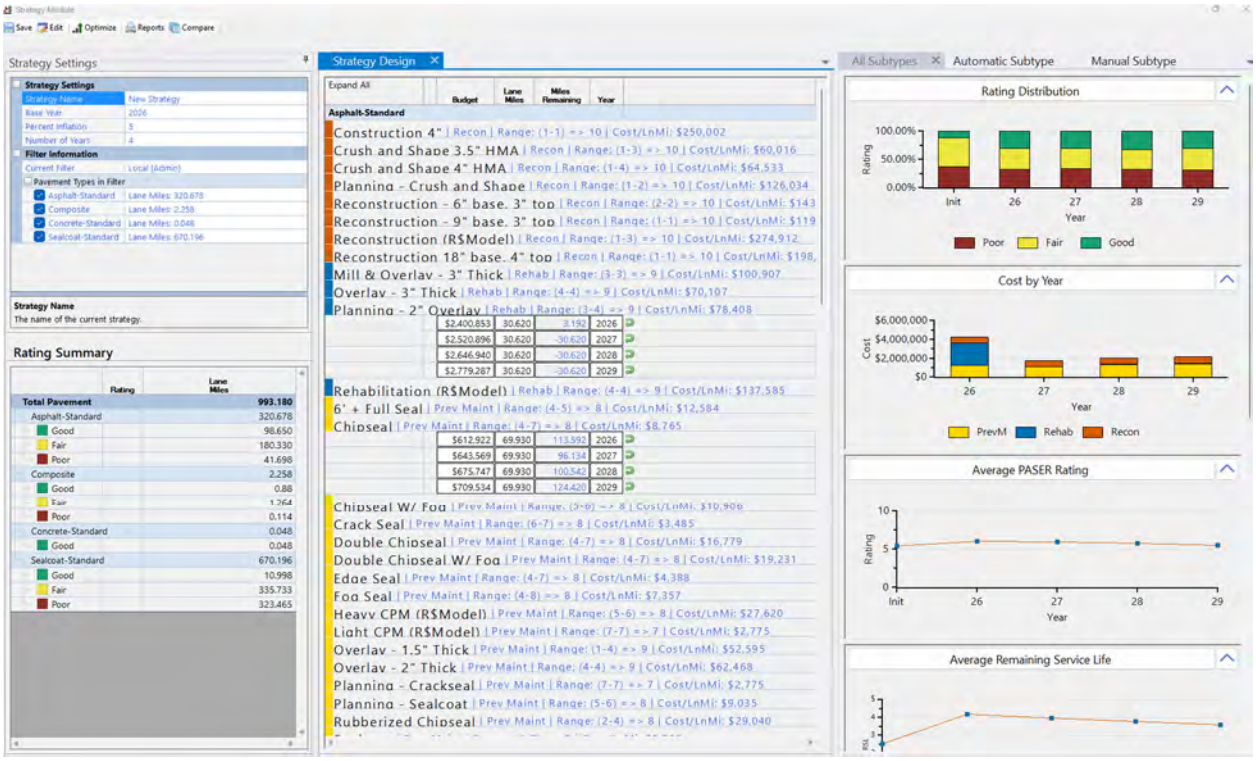


Figure 31: Pavement condition forecast model in the software program Roadsoft.

Table 31 illustrates the network-level model inputs for Roadsoft on the paved county local road network. Other pavement types in this network were neglected due to their small numbers relative to HMA pavements. The treatments outlined in Table 31 are the average treatment volume of planned projects scheduled to be completed in 2023-2026. Details on planned projects are included in Appendix A, and full model inputs and outputs are included in Appendix D.

Table 3: Roadsoft Modelled Trends, Planned Projects, and Gap Analysis for 's Road Assets—Modelled Trends: Roadsoft Annual Work Program for the Paved County Local Road Network Forecast

Treatment Name	Annual Miles of Treatment	Years of Life	Trigger-Reset
Crack Seal	5	1	7–7
Chip Seal	69	5	5, 6-8
Overlay	6	10	3, 4-9
Reconstruction	1	18	1, 2, 3-10
[Treatment 5]			
[Treatment 6]			
[Treatment 7]			
[Treatment 8]			

Results from the Roadsoft network condition model for the paved county local roads are shown in Figure 32. The Roadsoft network analysis of SJCRC's planned projects from its currently available budget $1,263,454.29 does not allow SJCRC to reach its pavement condition goal given the projects planned for the next three years.

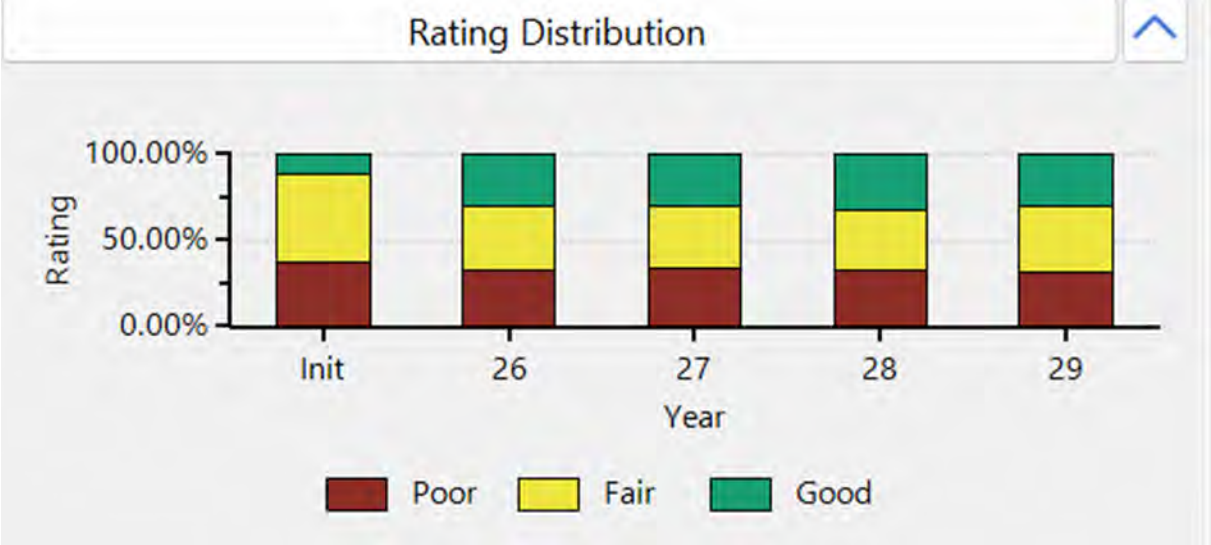


Figure 32: Forecast good/fair/poor changes to SJCRC network condition from planned projects on the paved county local road network.

The condition of the local road system in St. Joseph county has been getting better. This is because we have incorporated a rotation of sealcoating and have good township participation on our local roads.

Planned Projects

SJCRC plans construction and maintenance projects several years in advance. A multi-year planning threshold is required due to the time necessary to plan, design, and finance construction and maintenance projects on the paved county primary road network. This includes planning and programming requirements from state and federal agencies that must be met prior to starting a project and can include studies on environmental and archeological impacts, review of construction and design documents and plans, documentation of rights-of-way ownership, planning and permitting for storm water discharges, and other regulatory and administrative requirements.

Per PA 499 of 2002 (later amended by PA 199 of 2007), road projects for the upcoming three years are required to be reported annually to the TAMC. Planned projects represent the best estimate of future activity; however, changes in design, funding, and permitting may require SJCRC to alter initial plans. Project planning information is used to predict the future condition of the road networks that SJCRC maintains. The *1. Pavement Assets*: *Modelled Trends* section of this plan provides a detailed analysis of the impact of the proposed projects on their respective road networks.

For 2024-2026, SJCRC plans to do the following projects:

Paved County Primary Projects

SJCRC is currently planning the construction and maintenance projects listed in Appendix A for the paved county primary road network. The total cost of these projects is approximately $7,135,456.44.

Paved County Local Projects

SJCRC is currently planning the construction and maintenance projects listed in Appendix B for the paved county local road network. The total cost of these projects is approximately $3,740,673.40 plus $3,000,000 in matching funds with the townships.

More detailed information on these projects can be found in Appendix A-B.

2. FINANCIAL RESOURCES

Public entities must balance the quality and extent of services they can provide with the tax resources provided by citizens and businesses, all while maximizing how efficiently funds are used. SJCRC will overview its general expenditures and financial resources currently devoted to pavement maintenance and construction. This financial information is not intended to be a full financial disclosure or a formal report. Michigan agencies are required to submit an Act 51 Report to the Michigan Department of Transportation each year; this is a full financial report that outlines revenues and expenditures. This report can be obtained at the SJCRC office .

SJCRC has a total budget for pavement asset management of $6,000,000.

County Primary Network

SJCRC has historical spent $2,145,000 annually on pavement-related projects. Over the next three years, SJCRC plans to spend $7,135,453.44 on county primary-network projects consisting of, but not limited to, reconstruction, overlay, culvert replacement, and preventive maintenance. Routine maintenance is not included in this estimate. Spending on projects depends on revenue from MTF funds, EDD distribution through the RTF, STL Funds through the RTF. Grants are applied for every year by the SJCRC and priority projects are subject to change based on the grants that are awarded.

County Local Network

SJCRC has historical spent annually on pavement-related projects. Over the next three years, SJCRC plans to spend $6,740,673.40 on county local-network projects consisting of, but not limited to, reconstruction, overlay, culvert replacement, and preventive maintenance. Routine maintenance is not

included in this estimate. Spending on projects depends on revenue from MTF Funds along with Matching funds that are provided by the townships. Grants are applied for every year by the SJCRC and priority projects are subject to change based on the grants that are awarded.

3. RISK OF FAILURE ANALYSIS

Transportation infrastructure is designed to be resilient. The system of interconnecting roads and bridges maintained by SJCRC provides road users with multiple alternate options in the event of an unplanned disruption of one part of the system. There are, however, key links in the transportation system that may cause significant inconvenience to users if they are unexpectedly closed to traffic. Figure 33 illustrates the key transportation links in SJCRC's road network, including those that meet the following types of situations:

- **Geographic divides:** Areas where a geographic feature (river, lake, mountain or limited access road) limits crossing points of the feature
- **Emergency alternate routes for high-volume roads:** Roads which are routinely used as alternate routes for high volume roads or roads that are included in an emergency response plan
- **Limited access areas:** Roads that serve remote or limited access areas that result in long detours if closed
- **Main access to key commercial districts:** Areas where large number or large size business will be significantly impacted if a road is unavailable.

Our road network includes the following critical assets: (see Figure 33).

- Flowerfield Road / Johnson Road / Pulver connected M-216 to US-131
- Bent / Dutch Settlement / Hoffman / Stoldt / Abby / Broadway connects M-216 into the City of Three Rivers and provides access around a very large lake system.
- Broadway / Roberts connects US-131 to M-60

- Youngs Prairie provides a connection between M-60 to US-131
- Riverside drive provides a connection from US-12 to US-131
- Anderson / Blue School provides access to Anderson Farms during all weather times.
- Indian Prairie Road provides an alternate route next to US-12
- Indian Prairie / Kalamazoo provides an access over White Pigeon River
- Scotts Road provides a route towards Shipshewana
- A Road provides a route to the White Pigeon Compressor Station
- Centreville – Constantine provides a route between the Village of Centreville and the Village of Constantine
- Withers / Constantine provides a crossing over the St. Joseph River and is the only crossing between the city of Three Rivers and the Village of Constantine.
- Lutz is the route from the City of Three Rivers to the Village of White Pigeon
- Shimmel provides a connection between M-86 and US-12
- Wait Road / North Centreville Road provides a connection to the industrial district in the North West of the City of Sturgis off of M-66.
- White School / Progress provides a connection to the industrial district in the North West of the City of Sturgis off of US-12
- Franks Ave provides access from US-12 to Fawn River Road and passes the City of Sturgis High School and Eastwood
- Halfway Road Connects Burr Oak to US-12 and Fawn River Road
- East Lafayette and Big Hill connects US-12 to M-66 and provides an access to the Sturgis Middle School
- North Burr Oak Road / Sprowl Road connects the Village of Burr Oak to M-86
- Hackman Road proves connection between M-66 and North Burr Oak Road
- Shawtown provides a connection from North Burr Oak Road into Branch County
- Nottawa Road connects M-86 to Kalamazoo County and also runs through the Village of Mendon connecting M-60
- North Angling / Butler connects the Village of Centreville to Nottawa Road
- Angevine Road / Leland / Silver Street provides a crossing over the St. Joseph River and gives access to trucks that cannot cross the Langley Covered Bridge to the west.
- Holtom / Schweitzer provides a crossing over the St. Joseph River and connects M-86 to M-60

- Heimbach Road provides a connection between US-131 and M-60
- Silver Street provides a connection between M-60 and Kalamazoo County which leads to the Village of Vicksburg
- Michigan Ave provides access from US-131 across the majority of the county and gives an alternate route for M-60
- Jacksonburg Road connects M-66 with M-60
- Colon Road gives access from M-66 into the Village of Colon
- Farrand / Swonk / Fulton provides access from M-86 to Kalamazoo County, runs through M-60 and the Village of Leonidas. It also crosses the St. Joseph River and is the longest crossing the SJCRC has.
- Wattles Road is the route from M-86 to the Village of Sherwood in Branch County

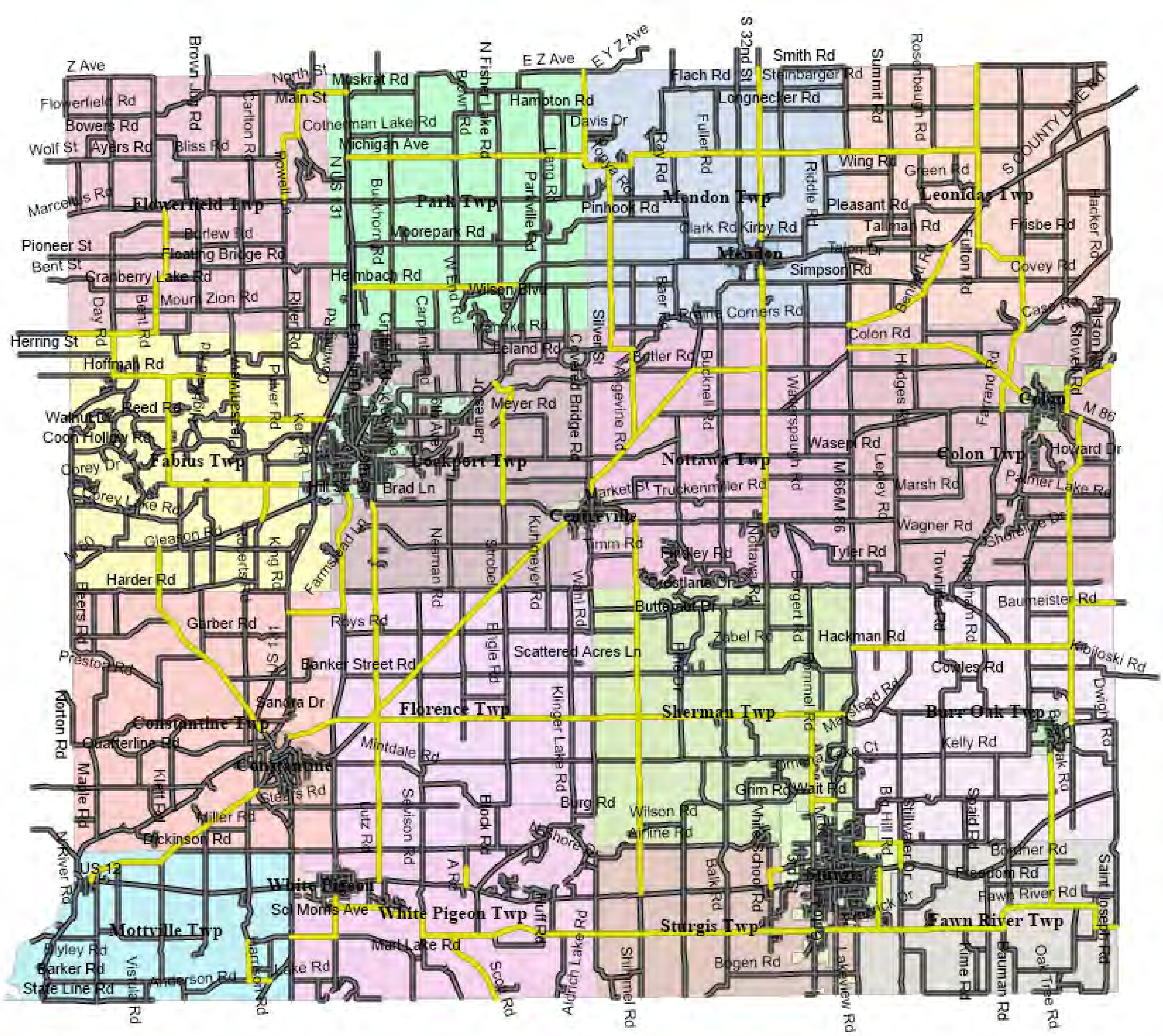


Figure 33: Key transportation links in SJCRC’s road network

4. COORDINATION WITH OTHER ENTITIES

An asset management plan provides a significant value for infrastructure owners because it serves as a platform to engage other infrastructure owners using the same shared right of way space. SJCRC communicates with both public and private infrastructure owners to coordinate work in the following ways:

Projects that will be paved in a given year are coordinated with all existing utility owners to protect the investment of the SJCRC for a project. Utilities that need upgrades, or need to relocate are required to do before a project starts.

The SJCRC meets with township representatives at the end of each year to discuss planned project in their township. With the match program that SJCRC has with the townships, coordinated projects are suggested and put into the next years plan. Townships that have a designated amount of money that they are going to spend have a multiyear plan set up, like White Pigeon Township.

APPENDIX A: 2024-2026 PAVED COUNTY PRIMARY ROAD PLANNED PROJECTS

Primary Road System				Reconstruction	$ 325,000.00	$ 334,750.00	$ 344,792.50
				Overlay	$ 150,000.00	$ 154,500.00	$ 159,135.00
				Widening	$ 650,000.00	$ 669,500.00	$ 689,585.00
				Sealcoat Cost	$ 24,000	$ 24,720	$ 25,462
Road Name	**From**	**To**	**Mileage**	**2027**		**2028**	**2029**
Lutz	Stears	Dickinson	1.01	$ 328,250.00		$ 24,967.20	
Lutz	US-12	Dickinson	0.71	$ 230,750.00		$ 17,551.20	
North River Road	Twp Line	Curve	4.80	$ 5,760,000.00		$ 118,656.00	
North River Road	Twp Line	US-12	0.37	$ 444,000.00		$ 9,146.40	
Airline	Shimmel	Balk	1.01	$ 328,250.00		$ 24,967.20	
Airline	Shimmel	Balk	1.01	$ 328,250.00		$ 24,967.20	
Hoffman	Day	US-131	5.85	$ 140,400.00			
Crooked Creek	Fawn River	Klinger Lake	3.96	$ 95,040.00			
N Burr Oak / Sprowl	Townline	M-86	3.90	$ 93,600.00			
N Burr Oak	Dwight	Shawtown	2.52	$ 60,480.00			
Fawn River	Big Hill	Bauman	2.39	$ 57,360.00			
Lutz	Centreville-Constantine	Stears	2.24	$ 53,760.00			
South River	Holtom	Covered Bridge	2.03	$ 48,720.00			
Nottawa	Michigan	Village Limits	2.01	$ 48,240.00			
Buckhorn	Twp Line	Moorepark	2	$ 48,000.00			
Ackey	S Burr Oak	US-12	1.90	$ 45,600.00			
Lutz	Centreville-Constantine	Roys	1.83	$ 43,920.00			
Buckhorn	City Limits	Edgerton	1.64	$ 39,360.00			
Halfway	US-12	Village Limits	1.49	$ 35,760.00			
Broadway	Ferguson	City Limits	1.39	$ 33,360.00			
Colon	Deno	Village Limits	1.37	$ 32,880.00			
Vistula Rd	US-12	Silver Creek	1.16	$ 27,840.00			
Fawn River	Millpond	Millpond	1.16	$ 27,840.00			
Heimbach	M-60	Frank Jones	1.05	$ 25,200.00			
Vistula Rd	Silver Creek	Barker	1.02	$ 24,480.00			
Johnson	Flowerfield	Pulver	1.02	$ 24,480.00			
Shawtown	N Burr Oak	Twp Line	1.00	$ 24,000.00			
Block	Haybridge	Dickinson	1.00	$ 24,000.00			
Frank Jones	Twp Line	Heimbach	0.99	$ 23,760.00			
Broadway	Krull	Ferguson	0.91	$ 21,840.00			
Featherstone	Constantine	Centreville-Constantine	0.83	$ 19,920.00			
Roberts	Broadway	M-60	0.83	$ 19,920.00			
South River	Covered Bridge	N Angling	0.64	$ 15,360.00			
Broadway	AL Jones	Krull	0.59	$ 14,160.00			
Covered Bridge	Causeway		0.57	$ 13,680.00			
Floating Bridge	River	Twp Line	0.52	$ 12,480.00			
Frank Jones	Leland	Twp Line	0.52	$ 12,480.00			
Leland	Frank Jones	Covered Bridge Curve E	0.52	$ 12,480.00			
Wait	N Centreville	M-60	0.51	$ 12,240.00			
Parkville	Heimbach	M-60	0.50	$ 12,000.00			
Floating Bridge	Twp Line	Wilbur	0.47	$ 11,280.00			
N Burr Oak	Shawtown	Twp Line	0.47	$ 11,280.00			
Vistula Rd	Indiana Line	Barker	0.45	$ 10,800.00			
Barker	Vistula Rd	Vistula Rd	0.36	$ 8,640.00			
Centreville-Constantine	Lutz	Featherstone	0.35	$ 8,400.00			
Nottawa	Fawn River	City Limits	0.29	$ 6,960.00			
Dickinson	Block	Strawser	0.26	$ 6,240.00			
N Burr Oak	Deer Park	Dwight	0.25	$ 6,000.00			

Primary Road System			Reconstruction	$ 325,000.00	$ 334,750.00	$ 344,792.50
			Overlay	$ 150,000.00	$ 154,500.00	$ 159,135.00
			Widening	$ 650,000.00	$ 669,500.00	$ 689,585.00
			Sealcoat Cost	$ 24,000	$ 24,720	$ 25,462
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
N Centreville	City Limits	Wait	0.19	$ 4,560.00		
Covered Bridge	Curve West		0.13	$ 3,120.00		
Haybridge	Block	Engle	0.13	$ 3,120.00		
Haybridge	Block	Engle	0.13	$ 3,120.00		
Kelly	Curve	Village Limits	4.28		$ 661,260.00	$ 108,975.65
N Lakeview	Wait	Kelly	0.64		$ 98,880.00	$ 16,295.42
N Lakeview	Wait	Kelly	0.64		$ 98,880.00	$ 16,295.42
Michigan	McClish	Correll	4.05		$ 100,116.00	
Fawn River	Bauman	St Joseph	3.59		$ 88,744.80	
Michigan	US-131	N Fisher Lake	3.50		$ 86,520.00	
Balk	Airline	Featherstone	3.08		$ 76,137.60	
Pulver	M-216	Null	3.04		$ 75,148.80	
Riverside	Twp Line	Village Limits	2.62		$ 64,766.40	
Corey Lake Road	County Line	A L Jones	2.56		$ 63,283.20	
Riverside Dr	US-12	Dickinson	2.15		$ 53,148.00	
Pulver	Hoffman	Null	2.07		$ 51,170.40	
Michigan	Nottawa	McClish	2.00		$ 49,440.00	
Scotts	Fawn River	Indiana Line	1.86		$ 45,979.20	
Bauman	Indiana Line	Fawn River	1.81		$ 44,743.20	
Correll	Twp Line	Swonk	1.48		$ 36,585.60	
Day	Lucas	Dutch Settlement	1.37		$ 33,866.40	
Farrand	Coohon	M-86	1.28		$ 31,641.60	
Farrand	Colon	Brandt	1.14		$ 28,180.80	
Featherstone	Village Limits	Constantine	1.08		$ 26,697.60	
Balk	US-12	Airline	1.07		$ 26,450.40	
Deer Park	N Burr Oak	Twp Line	1.00		$ 24,720.00	
Farrand	M-86	Colon	0.71		$ 17,551.20	
Correll	Michigan	M-60	0.64		$ 15,820.80	
Nottawa	Indiana Line	Bogen	0.50		$ 12,360.00	
Farrand	Brandt	Twp Line	0.39		$ 9,640.80	
North River Road	Curve	Village Limits	0.28		$ 6,921.60	
Covered Bridge	Curve East		0.10		$ 2,472.00	
Covered Bridge	Curve East		0.10		$ 2,472.00	
Parkville	Marcellus	Michigan	1			$ 689,585.00
Parkville	Marcellus	M-60	1.52			$ 38,701.63
Featherstone	Burg	M-66	5.85			$ 148,950.36
Fawn River	Kalamazoo	Millpond	4.33			$ 110,248.73
Youngs Prairie	Harder	Village Limits	4.33			$ 110,248.73
Centreville-Constantine	Lutz	Twp Line	3.92			$ 99,809.47
Fulton	M-60	Countyline	3.36			$ 85,550.98
Klinger Lake	Banker	Timm	3.32			$ 84,532.51
Colon	M-66	Deno	3.10			$ 78,930.96
Balk	Featherstone	Sauger Lake	2.54			$ 64,672.46
Centreville Constantine	Fairchild	Village Limits	2.32			$ 59,070.91
Silver	M-60	Michigan	2.27			$ 57,797.83
Lutz	Fairchild	City Limits	2.05			$ 52,196.28
Fawn River	Shimmel	Balk	2.03			$ 51,687.05
Fawn River	Balk	M-66	2.01			$ 51,177.82
Farrand	Wagner	Coohon	2.00			$ 50,923.20
Kalamazoo	Lake	Village	1.98			$ 50,413.97

Primary Road System			Reconstruction	$ 325,000.00	$ 334,750.00	$ 344,792.50
			Overlay	$ 150,000.00	$ 154,500.00	$ 159,135.00
			Widening	$ 650,000.00	$ 669,500.00	$ 689,585.00
			Sealcoat Cost	$ 24,000	$ 24,720	$ 25,462
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
East / Wattles	M-86	County Line	1.73			$ 44,048.57
Silver	Twp Line	M-60	1.51			$ 38,447.02
A L Jones	M-60	Broadway	1.46			$ 37,173.94
Franks Ave	Fawn River	US-12	1.41			$ 35,900.86
Fawn River	Millpond	Klinger Lake	1.27			$ 32,336.23
Lake	Kalamazoo	Indiana Line	1.20			$ 30,553.92
Fawn River	Klinger Lake	Shimmel	1.04			$ 26,480.06
White School	US-12	Fawn River	1.03			$ 26,225.45
Strobel	Hoshel	M-86	1.01			$ 25,716.22
Silver	Michigan	Springer	0.98			$ 24,952.37
Silver	Michigan	Springer	0.98			$ 24,952.37
Youngs Prairie	M-60	Harder	0.98			$ 24,952.37
Strobel	Hoshel	Centreville Constantine	0.79			$ 20,114.66
Lovers	Enterprise	Buckhorn	0.67			$ 17,059.27
White School	Airline	Progress	0.60			$ 15,276.96
Leland	Covered Bridge	Silver	0.53			$ 13,494.65
Airline	Balk	White School	0.52			$ 13,240.03
Airline	Balk	White School	0.52			$ 13,240.03
Nottawa	Bogen	City Limits	0.52			$ 13,240.03
Lake	Stone Lake	Kalamazoo	0.51			$ 12,985.42
Silver	Leland	Wakeman	0.50			$ 12,730.80
Stone Lake	Lake	Indiana Line	0.41			$ 10,439.26
Klinger Lake	Airline	US-12	0.34			$ 8,656.94
Klinger Lake	Airline	US-12	0.34			$ 8,656.94
Klinger Lake	Twp Line	Twp Line	0.22			$ 5,601.55
Klinger Lake	Twp Line	Twp Line	0.22			$ 5,601.55
Airline	Klinger Lake	Twp Line	0.10			$ 2,546.16
Airline	Klinger Lake	Twp Line	0.10			$ 2,546.16
			Chipseal	$ 2,479,187.00	$ 1,074,578.40	$ 2,924,384.14
			Overlay	$ -	$ 859,020.00	$ -
			Widening	$ 6,763,000.00	$ -	$ -
			Reconstruction	$ 656,500.00	$ -	$ 728,286.63
Cost Totals			Total Cost	$ 9,898,687.00	$ 1,933,598.40	$ 3,652,670.77
			Chipseal	55.34	52.38	72.46
			Overlay	0	5.56	0
			Widening	6.89	0	0
			Reconstruction	2.02	0	2.52
Miles Total			Total Mileage	64.25	57.94	74.98

APPENDIX B: 2027-2029 PAVED COUNTY LOCAL ROAD PLANNED PROJECTS

Burr Oak			Reconstruction	$325,000.00	$334,750.00	$344,792.50
			Overlay	$150,000.00	$154,500.00	$159,135.00
			Sealcoat Cost	$24,000.00	$24,720.00	$25,461.60
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
S Burr Oak	Village Limits	US-12	1.38	$207,000.00		
Maystead	Needham	Middle Colon	1.02	$24,480.00		
Big Hill	Maystead	Kelley	1.01	$24,240.00		
E Lafayette	Big Hill	Sweet Lake	0.75	$18,000.00		
Townline	Bridge Portion		0.15	$3,600.00		
Middle Colon	Baumeister	Townline	0.72		$17,798.40	
St Joseph	Twp Line	US-12	1.13		$27,933.60	
Middle Colon	Hackman	Baumeister	0.76		$18,787.20	
Maystead	Prairie River	Big Hill	0.46		$11,371.20	
Prairie River	Twp Line	Maystead	0.79		$19,528.80	
Witt Lake	Lakeview	Carpenterson	2.39		$59,080.80	
Big Hill	Witt Lake	E Lafayette	1.02		$25,214.40	
E Lafayette	End	County Farm	0.27		$6,674.40	
Evergreen Sub	All		0.36		$8,899.20	
Needham	Hackman	Maystead	1.68			$42,775.49
Steinbacher	Middle Colon	N Burr Oak	1.1			$28,007.76
Maple Sub	All		0.42			$10,693.87
Cost Totals			Chipseal	$70,320.00	$195,288.00	$81,477.12
			Overlay	$207,000.00	$ -	$ -
			Reconstruction	$ -	$ -	$ -
			Total Cost	$277,320.00	$195,288.00	$81,477.12
Miles Total			Chipseal	2.93	7.9	3.2
			Overlay	1.38	0	0
			Reconstruction	0	0	0
			Total Mileage	4.31	7.9	3.2

Colon			Reconstruction	$325,000.00	$334,750.00	$344,792.50
			Overlay	$150,000.00	$154,500.00	$159,135.00
			Sealcoat Cost	$24,000.00	$24,720.00	$25,461.60
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
Bonham	M-66	Lepley	1.03	$24,720.00		
Custer Valley	All		0.52	$12,480.00		
Francis	All		0.17	$4,080.00		
Townline	Bridge Portion		0.15	$3,600.00		
Willow	Burr Oak	End	0.12	$2,880.00		
Middle Colon	Townline	Custer	1.54		$38,068.80	
Shoreline Sub	All		0.96		$23,731.20	
Custer	Middle Colon	Decker	0.76		$18,787.20	
West Palmer Lake / Hill			1.86			$47,358.58
Mountian	Lepley	Fairfax	1.24			$31,572.38
Decker	Long Lake	North Burr Oak	1.2			$30,553.92
Fairfax	Mountian	M-86	0.98			$24,952.37
Cost Totals			Chipseal	$47,760.00	$80,587.20	$134,437.25
			Overlay	$ -	$ -	$ -
			Reconstruction	$ -	$ -	$ -
			Total Cost	$47,760.00	$80,587.20	$134,437.25
Miles Total			Chipseal	1.99	3.26	5.28
			Overlay	0	0	0
			Reconstruction	0	0	0
			Total Mileage	1.99	3.26	5.28

Constantine			Reconstruction	$325,000.00	$334,750.00	$344,792.50
			Overlay	$150,000.00	$154,500.00	$159,135.00
			Sealcoat Cost	$24,000.00	$24,720.00	$25,461.60
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
Yantzi Sub	All		0.39	$9,360.00		
Dickinson	Blue School	US-131	0.5	$12,000.00		
Constantine	Mintdale	Featherstone	0.5	$12,000.00		
Burke	Dickinson	Riverside	0.57	$13,680.00		
Millers Mill	End of 2017 Proj	Bus US-131	0.59	$14,160.00		
Dickinson	Riverside	Blue School	0.91	$21,840.00		
Juneberry Sub	All		0.98	$23,520.00		
Blue School	Dickinson	Riverside	1.25	$30,000.00		
Zerbe	Shaffer	Bus US-131	1.01		$24,967.20	
Quarterline	Millers Mill	Village Limits	3.79		$93,688.80	
Drummond	Roberts	US-131	0.36			$9,166.18
Klett	Quarterline	Millers Mill	0.69			$17,568.50
Withers	US-131	Twp Line	0.77			$19,605.43
Cost Totals			Chipseal	$136,560.00	$118,656.00	$46,340.11
			Overlay	$ -	$ -	$ -
			Reconstruction	$ -	$ -	$ -
			Total Cost	$136,560.00	$118,656.00	$46,340.11
Miles Total			Chipseal	5.3	4.8	1.82
			Overlay	0	0	0
			Reconstruction	0	0	0
			Total Mileage	5.3	4.8	1.82

Fabius			Reconstruction	$325,000.00	$334,750.00	$344,792.50
			Overlay	$150,000.00	$154,500.00	$159,135.00
			Sealcoat Cost	$24,000.00	$24,720.00	$25,461.60
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
Spence / Avery	All		1.78	$42,720.00		
Roberts	Drummond	M-60	1.73	$41,520.00		
Delihant / Edgewood	All		1.07	$25,680.00		
Mohney Lake	Pulver	Cowling	0.71	$17,040.00		
Highfield	All		0.65	$15,600.00		
Elizabeth Sub	All		0.57	$13,680.00		
Cochran	Gleason	M-60	0.53	$12,720.00		
Plesantview Sub	All		0.53	$12,720.00		
Circle / Church	All		0.52	$12,480.00		
Jennie	All		0.52	$12,480.00		
Fishing Site Sub	All		0.4	$9,600.00		
Kings Point Sub	All		0.36	$8,640.00		
Horseshoe Sub	All		0.36	$8,640.00		
King and Oak	N of Corey Lake		0.35	$8,518.18		
Wakeshma	All		0.34	$8,160.00		
Leo	All		0.28	$6,720.00		
Summit / Chub Knapp	Part		0.22	$5,281.82		
Harbor Dr	All		0.21	$5,040.00		
Hillside Sub	All		0.18	$4,320.00		
Harmon Ct	All		0.16	$3,931.82		
Summit End	Part		0.11	$2,586.36		
7 Hills Approach	N of Hoffman		0.06	$1,440.00		
Krull	Broadway	Harder	2.47		$61,058.40	
Dudd	M-60	Corey Lake	1.09		$26,944.80	
Treimanis Sub	All		0.72		$17,758.14	
Zemgate Sub	All		0.65		$16,185.05	
King	Gleason	US-131	0.62		$15,326.40	
Kerr Creek	Coon Hollow	US-131	0.25		$6,180.00	
Krull	Broadway	End	0.14		$3,460.80	
Coon Hollow	Stoldt	Ferguson	1.94			$49,395.50
Coon Hollow	Ferguson	US-131	1.93			$49,140.89
Ferguson N	Coon Hollow	Hoffman	0.75			$19,096.20
Drummond	Roberts	US-131	0.36			$9,166.18
Reed	West		0.17			$4,328.47
Knevels Sub	All		0.13			$3,310.01
Reed	East		0.07			$1,782.31
Cost Totals			Chipseal	$279,518.18	$146,913.58	$136,219.56
			Overlay	$ -	$ -	$ -
			Reconstruction	$ -	$ -	$ -
			Total Cost	$279,518.18	$146,913.58	$136,219.56
Miles Total			Chipseal	11.65	5.94	5.35
			Overlay	0	0	0
			Reconstruction	0	0	0
			Total Mileage	11.65	5.94	5.35

Fawn River			Reconstruction	$325,000.00	$334,750.00	$344,792.50
			Overlay	$150,000.00	$154,500.00	$159,135.00
			Sealcoat Cost	$24,000.00	$24,720.00	$25,461.60
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
E Lafayette	Big Hill	Sweet Lake	0.76	$18,240.00		
Miller	Curve	Indiana Line	1.01	$24,240.00		
County Farm	Fawn River	US-12	1.13	$27,120.00		
Carls	Fawn River	Indiana Line	1.5	$36,000.00		
Kime	Fawn River	Indiana Line	1.68	$40,320.00		
E Lafayette	End	County Farm	0.28		$6,921.60	
St Joseph	Round Lake	Silkens	2.09		$51,664.80	
Eisenhower Sub	All		1.56			$39,720.10
Big Hill Road	Fawn River	US-12	1.49			$237,111.15
Cost Totals			Chipseal	$145,920.00	$58,586.40	$39,720.10
			Overlay	$ -	$ -	$237,111.15
			Reconstruction	$ -	$ -	$ -
			Total Cost	$145,920.00	$58,586.40	$276,831.25
Miles Total			Chipseal	6.08	2.37	1.56
			Overlay	0	0	1.49
			Reconstruction	0	0	0
			Total Mileage	6.08	2.37	3.05

Florence			Reconstruction	$325,000.00	$334,750.00	$344,792.50
			Overlay	$150,000.00	$154,500.00	$159,135.00
			Sealcoat Cost	$24,000.00	$24,720.00	$25,461.60
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
Centreville-Constantine	Constantine	Featherstone	1.24	$186,000.00	$30,652.80	
Burgner	Centreville-Constantine	Banker	1.23	$29,520.00		
Banker	Burgener	Engle	1.02		$25,214.40	
Constantine	Featherstone	Banker	1.06		$26,203.20	
Banker	Engle	Burg	2.02		$49,934.40	
Withers	Twp Line	Constantine	0.52			$13,240.03
Constantine	Banker	Roys	1.02			$25,970.83
Mintdale	Sevison	to Bridge	1.24			$31,572.38
Sevison	Dickinson	N Mintdale	2.05			$52,196.28
Cost Totals			Chipseal	$29,520.00	$132,004.80	$122,979.53
			Overlay	$186,000.00	$ -	$ -
			Reconstruction	$ -	$ -	$ -
			Total Cost	$215,520.00	$132,004.80	$122,979.53
Miles Total			Chipseal	1.23	5.34	4.83
			Overlay	1.24	0	2.05
			Reconstruction	0	0	0
			Total Mileage	2.47	5.34	6.88

Flowerfield			Reconstruction	$325,000.00	$334,750.00	$344,792.50
			Overlay	$150,000.00	$154,500.00	$159,135.00
			Sealcoat Cost	$24,000.00	$24,720.00	$25,461.60
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
Carlton	Bliss	Flowerfield	1.53	$36,720.00		
Johnson	Pulver	Twp Line	1.31	$31,440.00		
Oak Plain	M-216	Bliss	1.01	$24,240.00		
Bliss	Oak Plain	Carlton	0.25	$6,000.00		
Creglow	M-216	Flowerfield	2.21		$54,631.20	
Mt Zion	Flatbush	Pulver	1.03		$25,461.60	
Day	Dutch Settlement	Cranberry Lake	1.01		$24,967.20	
Mt Zion	Delong	Flatbush	1		$24,720.00	
Day	Cranberry Lake	Old Hard Surface	1.6			$40,738.56
Flatbush	Floating Bridge	M-216	1.53			$38,956.25
Lewis Lake	M-216	Ayers	1.23			$31,317.77
Day	Bent	Break	1			$25,461.60
Berlew	Gravel	Pulver	0.05		$1,236.00	
Cost Totals			Chipseal	$98,400.00	$131,016.00	$136,474.18
			Overlay	$ -	$ -	$ -
			Reconstruction	$ -	$ -	$ -
			Total Cost	$98,400.00	$131,016.00	$136,474.18
Miles Total			Chipseal	4.1	5.3	5.36
			Overlay	0	0	0
			Reconstruction	0	0	0
			Total Mileage	4.1	5.3	5.36

Leonidas			Reconstruction	$325,000.00	$334,750.00	$344,792.50
			Overlay	$150,000.00	$154,500.00	$159,135.00
			Sealcoat Cost	$24,000.00	$24,720.00	$25,461.60
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
Correll	Swonk	M-60	1.89	$45,360.00		
Church	M-60	Fulton	0.11	$2,640.00		
Longnecker	Correll	Shorts	1.27		$31,394.40	
Shorts	Longnecker	M-60	0.89		$22,000.80	
Factoryville	Shorts	Countyline	0.84		$20,764.80	
Summit	Pleasant	Michigan	1.52			$38,701.63
Pleasant	Twp Line	Summit	0.99			$25,206.98
Pleasant	Summit	Olney	0.52			$13,240.03
Depot	M-60	End	0.14			$3,564.62
Cost Totals			Chipseal	$48,000.00	$74,160.00	$80,713.27
			Overlay	$ -	$ -	$ -
			Reconstruction	$ -	$ -	$ -
			Total Cost	$48,000.00	$74,160.00	$80,713.27
Miles Total			Chipseal	2	3	3.17
			Overlay	0	0	0
			Reconstruction	0	0	0
			Total Mileage	2	3	3.17

Lockport			Reconstruction	$325,000.00	$334,750.00	$344,792.50
			Overlay	$150,000.00	$154,500.00	$159,135.00
			Sealcoat Cost	$24,000.00	$24,720.00	$25,461.60
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
Woodland	All		0.16	$3,840.00		
Lambert	All		0.24	$5,760.00		
Darr	Mahnke	Twp Line	0.26	$6,240.00		
Woodside	All		0.29	$6,960.00		
Oakwood Sub	All		0.46	$11,040.00		
Haines	6th Ave	M-60	0.51	$12,240.00		
Crecent Beach	All		0.71	$17,040.00		
Major	Holtom	Covered Bridge	2	$48,000.00		
E Airport	N Airport	South Fisher Lake	1.01	$24,240.00		
Chippewa	Lovers	Eagle	0.13		$3,213.60	
Rivershore Sub	All		0.4		$9,888.00	
Tamarac Ln	Lovers	Buffalo	0.63		$15,573.60	
Buffalo, Comanche, Apache, Cherokee, Navajo, Puma	All		1.74		$43,012.80	
Constantine	Fairchild	City Limits	2.39		$59,080.80	
Griffith	All		0.24			$6,110.78
Limberlost	All		0.33			$8,402.33
Noah Lake	All		0.36			$9,166.18
Hoshel	Strobel	Centreville Constantine	0.8			$20,369.28
Eby Sub	All		1.02			$25,970.83
6th Ave	City Limits	Ash	1.21			$30,808.54
Cost Totals			Chipseal	$135,360.00	$130,768.80	$100,827.94
			Overlay	$ -	$ -	$ -
			Reconstruction	$ -	$ -	$ -
			Total Cost	$135,360.00	$130,768.80	$100,827.94
Miles Total			Chipseal	5.64	5.29	3.96
			Overlay	0	0	0
			Reconstruction	0	0	0
			Total Mileage	5.64	5.29	3.96

Mendon			Reconstruction	$325,000.00	$334,750.00	$344,792.50
			Overlay	$150,000.00	$154,500.00	$159,135.00
			Sealcoat Cost	$24,000.00	$24,720.00	$25,461.60
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
Baer	Prairie Corners	M-60	1.31	$31,440.00		
Prairie Corners	Twp Line	Walterspaugh	1.28	$30,720.00		
Prairie Corners	Walterspaugh	M-66	0.51	$12,240.00		
Prairie Corners	Baer	Twp Line	0.51	$12,240.00		
Hallam	Michigan	28th St	2		$49,440.00	
Buchner	Village Limits	Michigan	2.01		$49,687.20	
Riddle	Wing	Michigan	0.5		$12,360.00	
Bucknell	Hard Surface		0.58		$14,337.60	
Riddle	Pleasant	Wing	1.02		$25,214.40	
Longnecker	Gravel	McClish	0.5		$12,360.00	
Clark	Haas	Village Limits	1.26			$32,081.62
Walterspaugh	Prairie Corners	Simpson	1.01			$25,716.22
Pleasant	Riddle	Twp Line	0.52			$13,240.03
Haas	Clark	M-60	0.51			$12,985.42
Buchner	Gravel	Flach	0.41			$10,439.26
River Run	Wakeman	Baer	0.55			$14,003.88
Angevine	Pleasant	M-60	1.52	$228,000.00	$37,574.40	
Cost Totals			Chipseal	$262,667.00	$101,846.40	$76,384.80
			Overlay	$ -	$ -	$ -
			Reconstruction	$ -	$ -	$ -
			Total Cost	$262,667.00	$101,846.40	$76,384.80
Miles Total			Chipseal	3.61	8.13	4.26
			Overlay	1.52	0	0
			Reconstruction	0	0	0
			Total Mileage	5.13	8.13	4.26

Mottville			Reconstruction	$325,000.00	$334,750.00	$344,792.50
			Overlay	$150,000.00	$154,500.00	$159,135.00
			Sealcoat Cost	$24,000.00	$24,720.00	$25,461.60
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
Dickinson	Blue School	US-131	0.5	$12,000.00		
Dickinson	Riverside	Blue School	0.91	$21,840.00		
Indian Prairie	Blue School	US-131	1.03	$24,720.00		
Barker	Thomas	Vistula	1.15	$27,600.00		
Barker	M-103	Thomas Rd	1.16	$27,840.00		
Blue School	US-12	Dickinson	0.92		$22,742.40	
Blue School	Indian Prairie	US-12	1.34		$33,124.80	
Barker/Kneiber	Vistula	Indiana Line	0.96			$24,443.14
Thomas	Cecelia	Blyly	1.16			$29,535.46
Thomas	US-12	Cecelia	0.2			$5,092.32
Thomas	Indiana Line	Barker Rd	0.44			$11,203.10
Thomas	Blyly	Thomas Rd	1.01			$25,716.22
Cost Totals			Chipseal	$114,000.00	$55,867.20	$95,990.23
			Overlay	$ -	$ -	$ -
			Reconstruction	$ -	$ -	$ -
			Total Cost	$114,000.00	$55,867.20	$95,990.23
Miles Total			Chipseal	4.75	2.26	3.77
			Overlay	0	0	0
			Reconstruction	0	0	0
			Total Mileage	4.75	2.26	3.77

Nottawa			Reconstruction	$325,000.00	$334,750.00	$344,792.50
			Overlay	$150,000.00	$154,500.00	$159,135.00
			Sealcoat Cost	$24,000.00	$24,720.00	$25,461.60
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
Walterspaugh	Cupp	Gravel	0.08	$1,920.00		
Findley	Twp Line	Nottawa	0.15	$3,600.00		
Prairie Corners	Walterspaugh	M-66	0.51	$12,240.00		
Prairie Corners	Twp Line	Walterspaugh	1.29	$30,960.00		
Findley	M-86	Twp Line	3.02	$72,480.00		
Findley	Nottawa	M-66	1.01	$328,250.00	$24,967.20	
Angevine	Leland	Wakeman	0.48	$72,000.00	$11,865.60	
Cupp	Spring Creek	M-66	2.2	$52,800.00		
Spring Haven	Schweitzer	Angevine	0.38		$9,393.60	
Londick	Filmore	M-66	2.13		$52,653.60	
Butler	Angevine	Van Resort	0.05			$1,273.08
Marvin	Nottawa	End of Proj	0.26			$6,620.02
Riverside Dr	All		0.41			$10,439.26
Rambadt	Truckenmiller	M-86	0.51			$12,985.42
Van Resort	All		0.54			$13,749.26
Bucknell	M-86	Findley	1			$25,461.60
Marvin	End of Proj	M-66	1.75			$44,557.80
Cost Totals			Chipseal	$174,000.00	$98,880.00	$115,086.43
			Overlay	$72,000.00	$ -	$ -
			Reconstruction	$328,250.00	$ -	$ -
			Total Cost	$574,250.00	$98,880.00	$115,086.43
Miles Total			Chipseal	7.25	4	4.52
			Overlay	0.48	0	0
			Reconstruction	1.01	0	0
			Total Mileage	8.74	4	4.52

Park			Reconstruction	$325,000.00	$334,750.00	$344,792.50
			Overlay	$150,000.00	$154,500.00	$159,135.00
			Sealcoat Cost	$24,000.00	$24,720.00	$25,461.60
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
Fisher Sub	All		0.28	$6,720.00		
Gentzler Sub	All		0.41	$9,781.82		
Johnson	Twp Line	US-131	0.45	$10,800.00		
N Fisher Lake	M-60	Heimbach	0.72	$17,280.00		
Dentler Sub	All		0.79	$18,960.00		
Darr	Twp Line	Heimbach	0.99	$23,760.00		
Hampton	Parkville	Silver	1	$24,000.00		
Hutchinson	Moorepark	Marcellus	1	$24,000.00		
Hutchinson	Marcellus	Michigan	1.01	$24,240.00		
Hutchinson	Heimbach	Moorepark	1.01	$24,240.00		
N Fisher Lake	Heimbach	Moorepark	1.01	$24,240.00		
Heikes	Mint	County Line	0.44		$10,876.80	
Mint	N Fisher Lake	Heikes	0.49		$12,112.80	
Buckhorn	Michigan	Cotherman Lake	0.51		$12,607.20	
Cotherman Lake	Buckhorn	Buckhorn	0.65		$16,068.00	
Franklin	All		0.71		$17,551.20	
Cotherman Lake	Buckhorn	Hutchinson	0.87		$21,506.40	
Cotherman Lake	US-131	Buckhorn	0.99		$24,472.80	
Buckhorn	Cotherman Lake	Mint	1.46		$36,091.20	
Steven	All		0.34			$8,656.94
N Fisher Lake	Marcellus	Michigan	1			$25,461.60
N Fisher Lake	Moorepark	Marcellus	1			$25,461.60
Cost Totals			Chipseal	$208,021.82	$151,286.40	$59,580.14
			Overlay	$ -	$ -	$ -
			Reconstruction	$ -	$ -	$ -
			Total Cost	$208,021.82	$151,286.40	$59,580.14
Miles Total			Chipseal	8.67	6.12	2.34
			Overlay	0	0	0
			Reconstruction	0	0	0
			Total Mileage	8.67	6.12	2.34

Sherman			Reconstruction	$325,000.00	$334,750.00	$344,792.50
			Overlay	$150,000.00	$154,500.00	$159,135.00
			Sealcoat Cost	$24,000.00	$24,720.00	$25,461.60
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
Findley	Twp Line	Nottawa	0.14	$3,360.00		
Smother Sub	All		0.2	$4,800.00		
Wyndham Sub	All		0.23	$5,520.00		
Banker	Rommel	M-66	0.76	$18,240.00		
Findley	Nottawa	M-66	1.01	$328,250.00	$24,967.20	
Zable	Balk	Nottawa	1.01	$24,240.00		
Sherman Mill	Balk	Mintdale	1.54	$36,960.00		
Banker	Shimmel	Balk	2.02	$48,480.00		
Maystead	M-66	Twp Line	0.26		$6,427.20	
Mintdale	Sherman Mill	Balk	0.5		$12,360.00	
Schrader	Curve	Meyers	0.76		$18,787.20	
Mintdale	Meyers	N Centreville	0.8		$19,776.00	
Schrader	Meyers	N Centreville	0.94		$23,236.80	
Mintdale	Burg	Shimmel	1.01		$24,967.20	
Banker	Burg	Shimmel	1.05		$25,956.00	
Mintdale	Balk	Meyers	1.26		$31,147.20	
Mintdale	Shimmel	Sherman Mill	1.5		$37,080.00	
Wilson	Shimmel	Stubey	1.02			$25,970.83
Storms	Wahl	Shimmel	1.05			$26,734.68
Fair	Sauger Lake	W Fish Lake	1.16			$29,535.46
W Fish Lake	Sauger Lake	Fair	1.39			$35,391.62
Cost Totals			Chipseal	$143,627.00	$224,704.80	$117,632.59
			Overlay	$ -	$ -	$ -
			Reconstruction	$328,250.00	$ -	$ -
			Total Cost	$471,877.00	$224,704.80	$117,632.59
Miles Total			Chipseal	5.9	9.09	4.62
			Overlay	0	0	0
			Reconstruction	1.01	0	0
			Total Mileage	6.91	9.09	4.62

Sturgis			Reconstruction	$325,000.00	$334,750.00	$344,792.50
			Overlay	$150,000.00	$154,500.00	$159,135.00
			Sealcoat Cost	$24,000.00	$24,720.00	$25,461.60
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
Bogen	Nottawa	Lakeview	0.51	$12,240.00		
Nathan Place Sub	All		0.7	$16,800.00		
Bogen	Balke	M-66	2.03	$48,720.00		
Bogen	M-66	Nottawa	0.5	$12,000.00		
Balk	Fawn River	US-12	0.99		$24,472.80	
Stubey	US-12	Airline	1.08		$26,697.60	
Olnhausen	Klinger Lake	Shimmel	0.75		$18,540.00	
Stubey	Fawn River	Indiana Line	1.49			$37,937.78
Cost Totals			Chipseal	$89,760.00	$69,710.40	$37,937.78
			Overlay	$ -	$ -	$ -
			Reconstruction	$ -	$ -	$ -
			Total Cost	$89,760.00	$69,710.40	$37,937.78
Miles Total			Chipseal	3.74	2.82	1.49
			Overlay	0	0	0
			Reconstruction	0	0	0
			Total Mileage	3.74	2.82	1.49

White Pigeon			Reconstruction	$325,000.00	$334,750.00	$344,792.50
			Overlay	$150,000.00	$154,500.00	$159,135.00
			Sealcoat Cost	$24,000.00	$24,720.00	$25,461.60
Road Name	**From**	**To**	**Mileage**	**2027**	**2028**	**2029**
Jackson and Spring	Towards Lake		0.16	$3,840.00		
Huffs Lakeside	All		0.19	$4,560.00		
Hill Street	Non Gravel Portion		0.22	$5,280.00		
Dickinson	Strawser	Crooked Creek	0.38	$9,120.00		
Everson Sub	All		0.65	$15,604.55		
Dickinson	A Road	Block	0.75	$18,000.00		
Dickinson	Lutz	A Road	1.02	$24,480.00		
Aldrich Lake	Fawn River	Indiana Line	1.54	$36,960.00		
Benham	All		0.36	$54,096.59	$8,915.12	
Wildwood	All		0.38	$57,000.00	$9,393.60	
Fairview Dr	All		0.39	$58,500.00	$9,640.80	
North Shore	All		0.18		$4,447.73	
Saunders	Crooked Creek	Edgewater Beach	0.33		$8,197.86	
Edgewater Beach	Saunders	Crooked Creek	0.75		$18,469.77	
Lima	US-12	Fawn River	0.64		$98,880.00	$16,295.42
Hillandale	All		0.44			$11,203.10
Sevison	Fawn River	Marl Lake	0.51			$12,985.42
Indian Prairie	US-131	Kalamazoo	1			$25,461.60
Sevison	Marl Lake	Indiana	1.57			$39,974.71
Tomahawk Trail Sub	All		2.01			$51,177.82
Cost Totals			Chipseal	$117,844.55	$59,064.88	$157,098.07
			Overlay	$169,596.59	$98,880.00	$ -
			Reconstruction	$ -	$ -	$ -
			Total Cost	$287,441.14	$157,944.88	$157,098.07
Miles Total			Chipseal	4.91	2.39	6.17
			Overlay	1.13	0.64	0
			Reconstruction	0	0	0
			Total Mileage	6.04	3.03	6.17

APPENDIX C

A Quick Check of Your Highway Network Health

By Larry Galehouse, Director, National Center for Pavement Preservation
and

Jim Sorenson, Team Leader, FHWA Office of Asset Management

Historically, many highway agency managers and administrators have tended to view their highway systems as simply a collection of projects. By viewing the network in this manner, there is a certain comfort derived from the ability to match pavement actions with their physical/functional needs. However, by only focusing on projects, opportunities for strategically managing entire road networks and asset needs are overlooked. While the "bottom up" approach is analytically possible, managing networks this way can be a daunting prospect. Instead, road agency administrators have tackled the network problem from the "top down" by allocating budgets and resources based on historical estimates of need. Implicit in this approach, is a belief that the allocated resources will be wisely used and prove adequate to achieve desirable network service levels.

Using a quick checkup tool, road agency managers and administrators can assess the needs of their network and other highway assets and determine the adequacy of their resource allocation effort. A quick checkup is readily available and can be usefully applied with minimum calculations.

It is essential to know whether present and planned program actions (reconstruction, rehabilitation, and preservation) will produce a net improvement in the condition of the network. However, before the effects of any planned actions on the highway network can be analyzed, some basic concepts should be considered.

Assume every lane-mile segment of road in the network was rated by the number of years remaining until the end of life (terminal condition). Remember that terminal condition does not mean a failed road. Rather, it is the level of deterioration that management has set as a minimum operating condition for that road or network. Consider the rated result of the current network condition as shown in Figure 1.

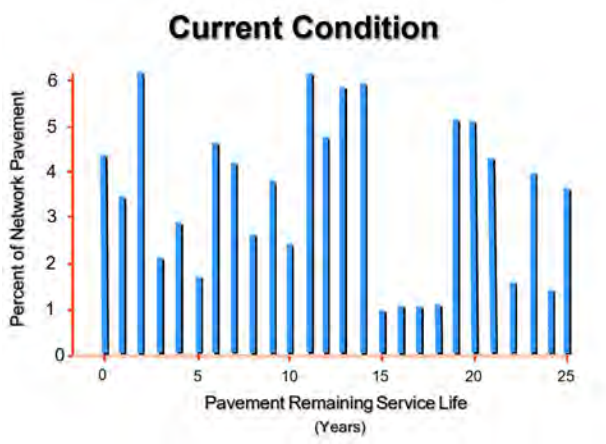


Figure 1 – Current Condition

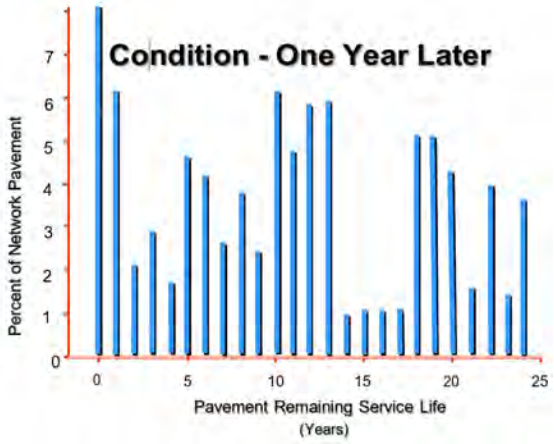


Figure 2 – Condition 1-Year Later

If no improvements are made for one year, then the number of years remaining until the end of life will decrease by one year for each road segment, except for those stacked at zero. The zero- stack will increase significantly because it maintains its previous balance and also becomes the recipient of those roads having previously been stacked with one year remaining. Thus, the entire network will age one year to the condition shown in Figure 2, with the net lane-miles in the zero stack raised from 4% to 8% of the network.

Some highway agencies still subscribe to the old practice of assigning their highest priorities to the reconstruction or rehabilitation of the worst roads. This practice of "worst first", i.e., continually addressing only those roads in the zero-stack, is a proven death spiral strategy because reconstruction and rehabilitation are the most expensive ways to maintain or restore serviceability. Rarely does sufficient funding exist to sustain such a strategy.

The measurable loss of pavement life can be thought of as the network's total lane-miles multiplied by 1 year, i.e., lane-mile-years. Consider the following quantitative illustration. Suppose your agency's highway network consisted of 4,356 lane-miles. Figure 3 shows that without intervention, it will lose 4,356 lane-mile-years per year.

Agency Highway Network = 4,356 lane miles

Each year the network will lose

4,356 lane-mile-years

Figure 3 – Network Lane Miles

To offset this amount of deterioration over the entire network, the agency would need to annually perform a quantity of work equal to the total number of lane-mile-years lost just to maintain the status quo. Performing work which produces fewer than 4,356 lane-mile-years would lessen the natural decline of the overall network, but still fall short of maintaining the

status quo. However, if the agency produces more than 4,356 lane-mile-years, it will improve the network.

In the following example, an agency can easily identify the effect of an annual program consisting of reconstruction, rehabilitation, and preservation projects on its network. This assessment involves knowing the only two components for reconstruction and rehabilitation projects: lane-miles and design life of each project fix. Figure 4 displays the agency's programmed activities for reconstruction and Figure 5 displays it for rehabilitation.

Reconstruction Evaluation

Projects this Year = 2

Project	Design Life	Lane Miles	Lane Mile Years	Lane Mile Cost	Total Cost
No. 1	25 yrs	22	550	$463,425	$10,195,350
No. 2	30 yrs	18	540	$556,110	$10,009,980
	Total	=	**1,090**		$20,205,330

Figure 4 - Reconstruction

Rehabilitation Evaluation

Projects this Year = 3

Project	Design Life	Lane Miles	Lane Mile Years	Lane Mile Cost	Total Cost
No. 10	18 yrs	22	396	$263,268	$5,791,896
No. 11	15 yrs	28	420	$219,390	$6,142,920
No. 12	12 yrs	32	384	$115,848	$3,707,136
	Total	=	**1,200**		$15,641,952

Figure 5 – Rehabilitation

When evaluating pavement preservation treatments in this analysis, it is appropriate to think in terms of "extended life" rather than design life. The term design life, as used in the reconstruction and rehabilitation tables, relates better to the new pavement's structural adequacy to handle repetitive loadings and environmental factors. This is not the goal of pavement preservation. Each type of treatment/repair has unique benefits that should be targeted to the specific mode of pavement deterioration. This means that life extension depends on factors such as type and severity of distress, traffic volume, environment, etc. Figure 6 exhibits the agency's programmed activities for preservation.

Preservation Evaluation

Project	Life Extension	Lane Miles	Lane Mile Years	Lane Mile Cost	Total Cost
No. 101	2 yrs	12	24	$2,562	$30,744
No. 102	3 yrs	22	66	$7,743	$170,346
No. 103	5 yrs	26	130	$13,980	$363,480
No. 104	7 yrs	16	112	$29,750	$476,000
No. 105	10 yrs	8	80	$54,410	$435,280
Total		=	**412**		$1,475,850

Figure 6 – Preservation

To satisfy the needs of its highway network, the agency must accomplish 4,356 lane-mile-years of work per year. The agency's program will derive 1,090 lane-mile-years from reconstruction, 1,200 lane-mile-years from rehabilitation, and 412 lane-mile-years from pavement preservation, for a total of 2,702 lane-mile-years. Thus, these programmed activities fall short of the minimum required to maintain the status quo, and hence would contribute to a net loss in network pavement condition of 1,653 lane-mile-years. The agency's programmed tally is shown in Figure 7.

Network Trend

Programmed Activity	Lane-Mile-Years	Total Cost
Reconstruction	1,090	$20,205,330
Rehabilitation	1,200	$15,641,952
Preservation	412	$1,475,850
Total	**2,702**	**$37,323,132**
Network Needs (Loss)	(-) 4,356	
Deficit =	**- 1,654**	

Figure 7 – Programmed Tally

This exercise can be performed for any pavement network to benchmark its current trend. Using this approach, it is possible to see how various long-term strategies could be devised and evaluated against a policy objective related to total-network condition.

Once the pavement network is benchmarked, an opportunity exists to correct any shortcomings in the programmed tally. A decision must first be made whether to improve the

network condition or just to maintain the status quo. This is a management decision and system goal.

Continuing with the previous example, a strategy will be proposed to prevent further network deterioration until additional funding is secured.

The first step is to modify the reconstruction and rehabilitation (R&R) programs. An agonizing decision must be made about which projects to defer, eliminate, or phase differently with multi- year activity. In Figure 8, reductions are made in the R&R programs to recover funds for less costly treatments in the pavement preservation program. The result of this decision recovered slightly over $6 million.

Program Modification

Programmed Activity	Lane-Mile-Years	Cost Savings
Reconstruction ***31 lane miles*** ~~(40 lane-miles)~~	***820*** ~~(1,090)~~	**$5,004,990**
Rehabilitation ***77 lane miles*** ~~(82 lane-miles)~~	***1,125*** ~~(1,200)~~	**$1,096,950**
Pavement Preservation (84 lane-miles)	(412)	**0**
Total =	***2,357*** **(2,702)**	**$6,101,940**

Figure 8 – Revised R & R Programs

Modifying the reconstruction and rehabilitation programs has reduced the number of lane-mile- years added to the network from 2,702 to 2,357 lane-mile-years. However, using less costly treatments elsewhere in the network to address roads in better condition will increase the number of lane-mile-years added to the network. A palette of pavement preservation treatments, or mix of fixes, is available to address the network needs at a much lower cost than traditional methods.

Preservation treatments are only suitable if the right treatment is used on the right road at the right time. In Figure 9, the added treatments used include concrete joint resealing, thin hot-mix asphalt (HMA) overlay (≤ 1.5”), microsurfacing, chip seal, and crack seal. By knowing the cost per lane-mile and the treatment life-extension, it is possible to create a new strategy (costing $36,781,144) that satisfies the network need. In this example, the agency saved in excess of $500,000 from traditional methods (costing $37,323,132), while erasing the 1,653 lane-mile-year deficit produced by the initial program tally. Network Strategy

Programmed Activity		Lane Mile Years	Total Cost
Reconstruction	(31 lane-miles)	820	$15,200,340
Rehabilitation	(77 lane-miles)	1,125	$14,545,002
Pavement Preservation	(84 lane-miles)	412	$1,475,850
Concrete Resealing	(4 years x 31 lane-miles)	124	$979,600
Thin HMA Overlay	(10 years x 16 lane-miles)	160	$870,560
Microsurfacing	(7 years x 44 lane-miles)	308	$1,309,000
Chip Seal	(5 years x 79 lane-miles)	395	$1,104,420
Crack Seal	(2 years x 506 lane-miles)	1,012	$1,296,372
	Total =	4,356	$36,781,144

Figure 9 – New Program Tally

In a real-world situation, the highway agency would program its budget to achieve the greatest impact on its network condition. Funds allocated for reconstruction and rehabilitation projects must be viewed as investments in the infrastructure. Conversely, funds directed for preservation projects must be regarded as protecting and preserving past infrastructure investments.

Integrating reconstruction, rehabilitation, and preservation in the proper proportions will substantially improve network conditions for the taxpayer while safeguarding the highway investment.

APPENDIX D: ROADSOFT NETWORK-LEVEL MODEL INPUTS AND OUTPUTS

B. BRIDGE ASSET MANAGEMENT PLAN

An attached bridge asset management plan follows.

St. Joseph County Road Commission
2026 Bridge
Asset Management Plan

A plan describing the St. Joseph County Road Commission’s transportation assets and conditions

Prepared by
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Author's title: Managing Director
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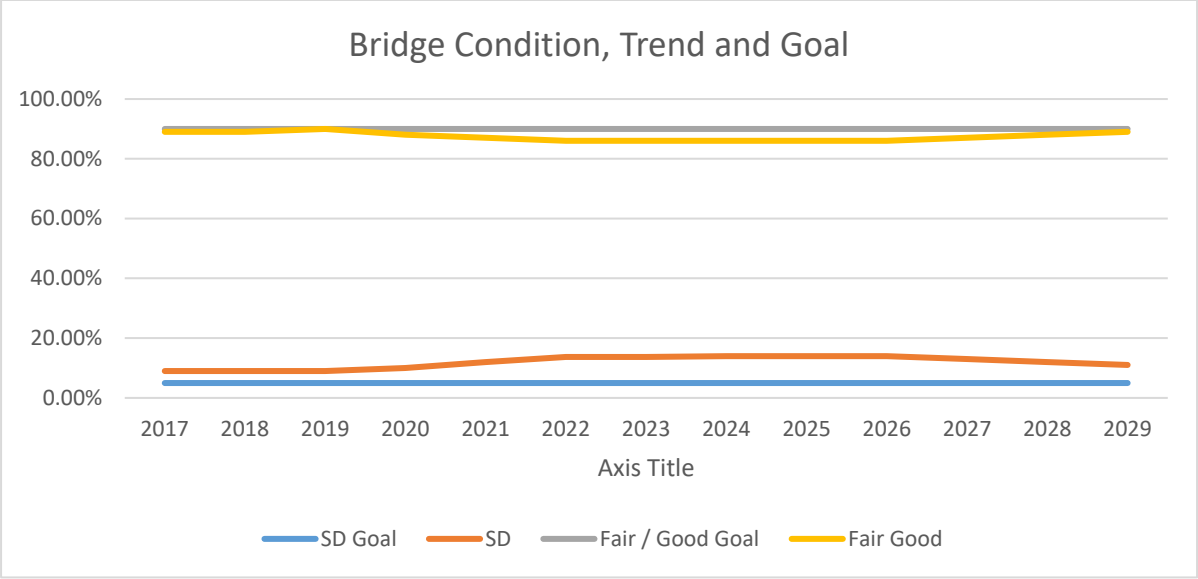
EXECUTIVE SUMMARY

As conduits for commerce and connections to vital services, bridges are among the most important assets in any community along with other assets like roads, culverts, traffic signs, traffic signals, and utilities that support and affect the road network. The St. Joseph County Road Commission's (SJCRC) bridges, other road-related assets, and support systems are some of the most valuable and extensive public assets, all of which are paid for with taxes collected from ordinary citizens and businesses. The cost of building and maintaining bridges, their importance to society, and the investment made by taxpayers all place a high level of responsibility on local agencies to plan, build, and maintain the road and bridge network in an efficient and effective manner. This asset management plan is intended to report on how SJCRC is meeting its obligations to maintain the bridges for which it is responsible.

This plan overviews SJCRC's bridge assets and conditions and explains how St. Joseph County Road Commission works to maintain and improve the overall condition of those assets. These explanations can help answer:

- What kinds of bridge assets SJCRC has in its jurisdiction and the different options for maintaining these assets.
- What tools and processes SJCRC uses to track and manage bridge assets and funds.
- What condition SJCRC's bridge assets are in compared to statewide averages.
- Why some bridge assets are in better condition than others and the path to maintaining and improving bridge asset conditions through proper planning and maintenance.
- How agency bridge assets are funded and where those funds come from.
- How funds are used and the costs incurred during SJCRC's bridge assets' normal life cycle.
- What condition SJCRC can expect of its bridge assets if those assets continue to be funded at the current funding levels
- How changes in funding levels can affect the overall condition of all of SJCRC's bridge assets.

SJCRC owns and/or manages 102 bridges. A summary of its historical and current bridge asset conditions, projected trends, and goals can be seen in the Figure, below.



An asset management plan is required by Michigan Public Act 325 of 2018, and this document represents fulfillment of some of SJCRC's obligations towards meeting these requirements. This asset management plan also helps demonstrate SJCRC's responsible use of public funds by providing elected and appointed officials as well as the general public with inventory and condition information of SJCRC's bridge assets, and gives taxpayers the information they need to make informed decisions about investing in essential transportation infrastructure.

INTRODUCTION

Asset management is defined by Public Act 325 of 2018 as “an ongoing process of maintaining, preserving, upgrading, and operating physical assets cost effectively, based on a continuous physical inventory and condition assessment and investment to achieve established performance goals”. In other words, asset management is a process that uses data to manage and track assets, like roads and bridges, in a cost-effective manner using a combination of engineering and business principles. This process is endorsed by leaders in municipal planning and transportation infrastructure, including the Michigan Municipal League, County Road Association of Michigan, the Michigan Department of Transportation (MDOT), and the Federal Highway Administration (FHWA). The St. Joseph County Road Commission is supported in its use of asset management principles and processes by the Michigan Transportation Asset Management Council (TAMC), formed by the State of Michigan.

Asset management, in the context of this plan, ensures that public funds are spent as effectively as possible to maximize the condition of the bridges in St. Joseph County Road Commission’s road network. Asset management also provides a transparent decision-making process that allows the public to understand the technical and financial challenges of managing infrastructure with a limited budget.

The St. Joseph County Road Commission (SJCRC) has adopted an “asset management” business process to overcome the challenges presented by having limited financial, staffing, and other resources while needing to meet safety standards and bridge users’ expectations. SJCRC is responsible for maintaining and operating 102 bridges.

This 2026 plan outlines how SJCRC determines its strategy to maintain and upgrade bridge asset condition given agency goals, priorities of its bridge users, and resources provided. An updated plan is to be released approximately every three years to reflect changes in bridge conditions, finances, and priorities.

Questions regarding the use or content of this plan should be directed to Garrett Myland at 20914 M-86, Centreville, MI 49032or at (269)-467-6393 and.or gmyland@sjcrc.com. A copy of this plan can be accessed on our website at stjoeroads.com.

Key terms used in this plan are defined in SJCRC's comprehensive transportation asset management plan (also known as the "compliance plan") used for compliance with PA 325 or 2018.

Knowing the basic features of an asset class is a crucial starting point to understanding the rationale behind an asset management approach. The following primer provides an introduction to bridges.

Bridge Primer

Bridge Types

Bridges are structures that span 20 feet or more. These bridges can extend across one or multiple spans.

If culverts are placed side by side to form a span of 20 feet or more (for example, three 6-foot culverts with one-foot between each culvert), then this culvert system would be defined as a bridge. (Note: The Compliance Plan Appendix C contains a primer on culverts not defined as bridges.)

Figure 1: Girder bridge

Bridge types are classified based on two features: design and material.

The most common bridge design is the **girder system** (Figure 1). With this design, the bridge deck transfers vehicle loads to girders (or beams) that, in turn, transfer the load to the piers or abutments (see Figure 6).

Figure 2: Slab bridge

A similar design that lacks girders (or beams) is a **slab bridge** (Figure 2, and see Figure 6). A slab bridge transfers the vehicle load directly to the abutments and, if necessary, piers.

Truss bridges were once quite common and consist of a support structure that is created when structural members are connected at joints to form interconnected triangles (Figure 4). Structural members may consist of steel tubes or angles connected at joints with gusset plates.

Figure 3: Truss bridge

Another common bridge design in Michigan is the three-sided pre-cast box or arch bridge (Figure 4).

Michigan is also home to several unique bridge designs.

Adding another layer of complexity to bridge typing is the primary construction materials used (Figure 5). Bridges are generally constructed from concrete, steel, pre-stressed concrete, or timber. Some historical bridges or bridge components in Michigan may be constructed from stone or masonry.

Figure 4: Three-sided box bridge

Figure 5: Examples of common bridge construction materials used in Michigan

Bridge Condition

Michigan inspectors rate bridge condition on a 0-9 scale known as the National Bridge Inventory (NBI) rating scale (see Table for a summary of the NBI Rating scale). Elements of the bridge's superstructure, deck, and substructure receive a 9 if they are in excellent condition down to a 0 if they are in failed condition. A complete guide for Michigan bridge condition rating according to the NBI can be found in the MDOT Bridge Field Services' *Bridge Safety Inspection NBI Rating Guidelines* (https://www.michigan.gov/documents/mdot/BIR_Ratings_Guide_Combined_2017-10-30_606610_7.pdf).

Table 1: Summary of the NBI Rating Scale

NBI Rating	General Condition
9-7	Like new/good
6-5	Fair
4-3	Poor/serious
2-0	Critical/failed

Bridge Treatments

Replacement

Replacement work is typically performed when a bridge is in poor condition (NBI rating of 4 or less) and will improve the bridge to good condition (NBI rating of 7 or more). The Local Bridge Program, a part of MDOT's Local Agency Program, defines bridge replacement as full replacement, which removes the entire bridge (superstructure, deck, and substructure) before re-building a bridge at the same location (Figure 6). The decision to perform a total replacement over rehabilitation (see below) should be made based on a life-cycle cost analysis. Generally, replacement is selected if rehabilitation costs more than two-thirds of the cost of replacement. Replacement is generally the most expensive of the treatment options.

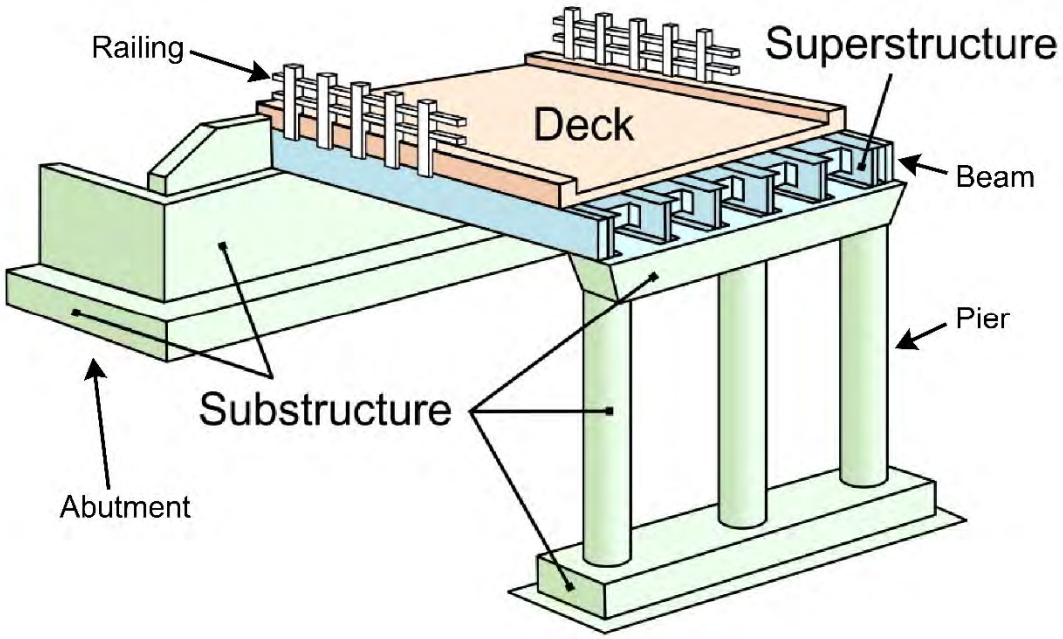


Figure 6: Diagram of basic elements of a bridge

Rehabilitation

Rehabilitation involves repairs that improve the existing condition and extend the service life of the structure and the riding surface. Most often, rehabilitation options are associated with bridges that have degraded beyond what can be fixed with preventive maintenance. Rehabilitation is typically performed on poor-rated elements (NBI rating of 4 or less) to improve them to fair or good condition (NBI rating of 5 or more). Rehabilitation can include superstructure replacement (removal and replacement of beams and deck) or deck replacement. While typically more expensive than general maintenance, rehabilitation treatments may be more cost-effective than replacing the entire structure.

- **Railing retrofit/replacement:** A railing retrofit or replacement either reinforces the existing railing or replaces it entirely (Figure 6). This rehabilitation is driven by a need for safety improvements on poor-rated railings or barriers (NBI rating less than 5).
- **Beam repair:** Beam repair corrects damage that has reduced beam strength (Figure 6). In the case of steel beams, it is performed if there is 25 percent or more of section loss in an area of the beam that affects load-carrying capacity. In the case of concrete beams, this is performed if there is 50 percent or more spalling (i.e., loss of material) at the ends of beams.
- **Substructure concrete patching and repair:** Patching and repairing the substructure is essential to keep a bridge in service. These rehabilitation efforts are performed when the abutments or piers are fair or poor (NBI rating of 5 or 4), or if spalling and delamination affect less than 30 percent of the bridge surface.

Preventive Maintenance

The Federal Highway Administration's (FHWA) *Bridge Preservation Guide* (2018) defines preventive maintenance as "a strategy of extending service life by applying cost-effective treatments to bridge elements…[that] retard future deterioration and avoid large expenses in bridge rehabilitation or replacements."

Preventive maintenance work is typically done on bridges rated fair (NBI rating of 5 or 6) in order to slow the rate of deterioration and keep them from falling into poor condition.

- **Concrete deck overlay:** A concrete deck overlay involves removing and replacing the driving surface. Typically, this is done when the deck surface is poor (NBI rating is less than 5) and the underneath portion of the deck is at least fair (NBI rating greater than 4). A shallow or deep concrete overlay may be performed depending on the condition of the bottom of the deck. The MDOT *Bridge Deck Preservation* matrices provide more detail on concrete deck overlays (see https://www.michigan.gov/mdot/0,4616,7-151-9625_24768_24773---,00.html).

- **Deck repairs:** Deck repairs include three common techniques: HMA overlay with or without waterproof membranes, concrete patching, deck sealing, crack sealing, and joint repair/replacement. An HMA overlay with an underlying waterproof membrane can be placed on bridge decks with a surface rating of fair or lower (NBI of 5 or less) and with deficiencies that cover between 15 and 30 percent of the deck surface and deck bottom. An HMA overlay without a waterproof membrane should be used on a bridge deck with a deck surface and deck bottom rating of serious condition or lower (NBI rating of 3 or less) and with deficiencies that cover greater than 30 percent of the deck surface and bottom; this is considered a temporary holdover to improve ride quality when a bridge deck is scheduled to undergo major rehabilitation within five years. All HMA overlays need to be accompanied by an updated load rating. Patching of the concrete on a bridge deck is done in response to an inspector's work recommendation or when the deck surface is in good, satisfactory, or fair condition (NBI rating of 7, 6, or 5) with minor delamination and spalling. To preserve a good bridge deck in good condition, a deck sealer can be used.

  Deck sealing should only be done when the bridge deck has surface rating of fair or better (NBI of 5 or more). Concrete sealers should only be used when the top and bottom surfaces of the deck are free from major deficiencies, cracks, and spalling. An epoxy overlay may be used when between 2 and 5 percent of the deck surface has delaminations and spalls, but these deficiencies must be repaired prior to the overlay. An epoxy overlay may also be used to repair an existing epoxy overlay. Concrete crack sealing is an option to maintain concrete in otherwise good condition that has visible cracks with the potential of reaching the steel reinforcement. Crack sealing may be performed on concrete with a surface rating of good, satisfactory, or fair (NBIS rating of 7, 6, or 5) with minor surface spalling and delamination; it may also be performed in response to a work recommendation by an inspector who has determined that the frequency and size of the cracks require sealing.

- **Steel bearing repair/replacement:** Rather than sitting directly on the piers, a bridge superstructure is separated from the piers by bearings. Bearings allow for a certain degree of movement due to temperature changes or other forces. Repairing or replacing the bearings is considered preventive maintenance. Girders and a deck in at least fair condition (NBI of 5 or higher) and bearings in poor condition (NBI rating of 4 or less) identifies candidates for this maintenance activity.
- **Painting:** Re-painting a bridge structure can either be done in totality or in part. Total re-painting is done in response to an inspector's work recommendation or when the paint condition is in serious condition (NBI rating of 3 or less). Partial re-painting can either consist of zone re-painting, which is a preventive maintenance technique, or spot re-painting, which is scheduled maintenance (see below). Zone re-painting is done when less than 15 percent of the paint in a smaller area, or zone, has failed while the rest of the bridge is in good or fair condition. It is also done if the paint condition is fair or poor (NBI rating of 5 or 4).
- **Channel improvements:** Occasionally, it is necessary to make improvements to the waterway that flows underneath the bridge. Such channel improvements are driven by an inspector's work recommendation based on a hydraulic analysis or to remove vegetation, debris, or sediment from the channel and banks (Figure 6).
- **Scour countermeasures:** An inspector's work recommendations or a hydraulic analysis may require scour countermeasures (see the *Risk Management* section of this plan for more information on scour). This is done when a structure is categorized as scour critical and is not scheduled for replacement or when NBI comments in abutment and pier ratings indicate the presence of scour holes.
- **Approach repaving:** A bridge's approach is the transition area between the roadway leading up to and away from the bridge and the bridge deck. Repaving the approach areas is performed in response to an inspector's work recommendation, when the pavement surface is in poor condition (NBI rating of 4 or less), or when the bridge deck is replaced or rehabilitated (e.g., concrete overlay).
- **Guardrail repair/replacement:** A guardrail is a safety feature on many roads and bridges that prevents or minimizes the effects of lane departure incidents. Keeping bridge guardrails in good condition is important. Repair or replacement of bridge guardrail should be done when a guardrail is missing or damaged, or when it needs a safety improvement.

Scheduled Maintenance

Scheduled maintenance activities are those activities or treatments that are regularly scheduled and intend to maintain serviceability while reducing the rate of deterioration.

- **Superstructure washing:** Washing the superstructure, or the main structure supporting the bridge, typically occurs in response to an inspector's work recommendation or when salt-

contaminated dirt and debris collected on the superstructure is causing corrosion or deterioration by trapping moisture.

- **Drainage system cleanout/repair:** Keeping a bridge's drainage system clean and in good working order allows the bridge to shed water effectively. An inspector's work recommendation may indicate drainage system cleanout/repair. Signs that a drainage system needs cleaning or repair include clogs and broken, deteriorated, or damaged drainage elements.

- **Spot painting:** Spot painting is a form of partial bridge painting. This scheduled maintenance technique involves painting a small portion of a bridge. Generally, this is done in response to an inspector's work recommendation and is used for zinc-based paint systems only.

- **Slope repair/reinforcement:** The terrain on either side of the bridge that slopes down toward the channel is called the slope. At times, it is necessary to repair the slope. Situations that call for slope repair include when the slope is degraded, when the slope has significant areas of distress or failure, when the slope has settled, or if the slope is in fair or poor condition (NBI rating of 5 or less). Other times, it is necessary to reinforce the slope. Reinforcement can be added by installing Riprap, which is a side-slope covering made of stones. Riprap protects the stability of side slopes of channel banks when erosion threatens the surface.

- **Vegetation control and debris removal:** Keeping the area around a bridge structure free of vegetation and debris safeguards the bridge structure from these potentially damaging forces. Removing or restricting vegetation around bridges prevents damage to the structure. Vegetation control is done in response to an inspector's work recommendation or when vegetation traps moisture on structural elements or is growing from joints or cracks. Debris in the water channel or in the bridge can also cause damage to the structure. Removing this debris is typically done in response to an inspector's work recommendation or when vegetation, debris, or sediment accumulates on the structure or channel.

- **Miscellaneous repairs:** These are uncategorized repairs in response to an inspector's work recommendation.

1. BRIDGE ASSETS

SJCRC seeks to implement an asset management program for its bridge structures. This program balances the decision to perform reconstruction, rehabilitation, preventive maintenance, scheduled maintenance, or new construction, with SJCRC's bridge funding in order to maximize the useful service life and to ensure the safety of the local bridges under its jurisdiction. In other words, SJCRC's bridge asset management program aims to preserve and/or improve the condition of its local bridge network within the means of its financial resources.

Nonetheless, SJCRC recognizes that limited funds are available for improving the bridge network. Since preservation strategies like preventive maintenance are generally a more effective use of these funds than costly alternative management strategies like major rehabilitation or replacement, SJCRC seeks to identify those bridges that will benefit from a planned maintenance program while addressing those bridges that pose usability and/or safety concerns.

The three-fold goal of SJCRC's asset management program is the preservation and safety of its bridge network, increase of its bridge assets' useful service life by extending of the time that bridges remain in good and fair condition, and reduction of future maintenance costs. To quantify this goal, SJCRC specifically aims to have to have 90% or more of the agency's local bridges in fair to good condition and to have less than 0% classify as structurally deficient over its three-year plan.

Thus, SJCRC's asset management plan objectives are:

- To establish the current condition of the county's bridges
- To develop a "mix of fixes" that will:
    - Program scheduled maintenance actions to impede deterioration of bridges in good condition
    - Implement selective corrective repairs or rehabilitation for degraded bridge elements order to restore functionality
    - Identify and program those eligible bridges in need of replacement
- To identify available funding sources, such as:

    - Dedicated county resources
    - County funding through Michigan's Local Bridge Program
    - Opportunities to obtain other funding
- To prioritize the programmed actions within available funding limitations
- To improve the condition of bridges currently rated poor (4 or lower) and/or preserve bridges currently rated fair (5 or higher) in their current condition in order to extend their useful service life.

Inventory

SJCRC is responsible for 102 local bridges. Table 2 summarizes SJCRC's bridge assets by type, sizes by bridge type, and condition by bridge type. Additional inventory data, condition ratings, and proposed preventive maintenance actions for each bridge are contained in the tables in Appendixes 3, 4, and 5. The bridge inventory data was obtained from MDOT MiBRIDGE and other sources, and the 2022 condition data and maintenance actions are taken from the inspector's summary report (see Appendix 2).

Types

Of the SJCRC's 102 structures, 3 are prestressed concrete I beams, 32 are prestressed concrete box beams, 1 is concrete slab, 1 is concrete box, 53 are timber slabs, 2 are timber stringers, 1 is a timber box culvert, 1 is timber truss with steel girder, 2 are steel stringers, 4 are steel culverts, 1 is a steel tub girder and 1 is an aluminum arched culvert.

Locations and Sizes

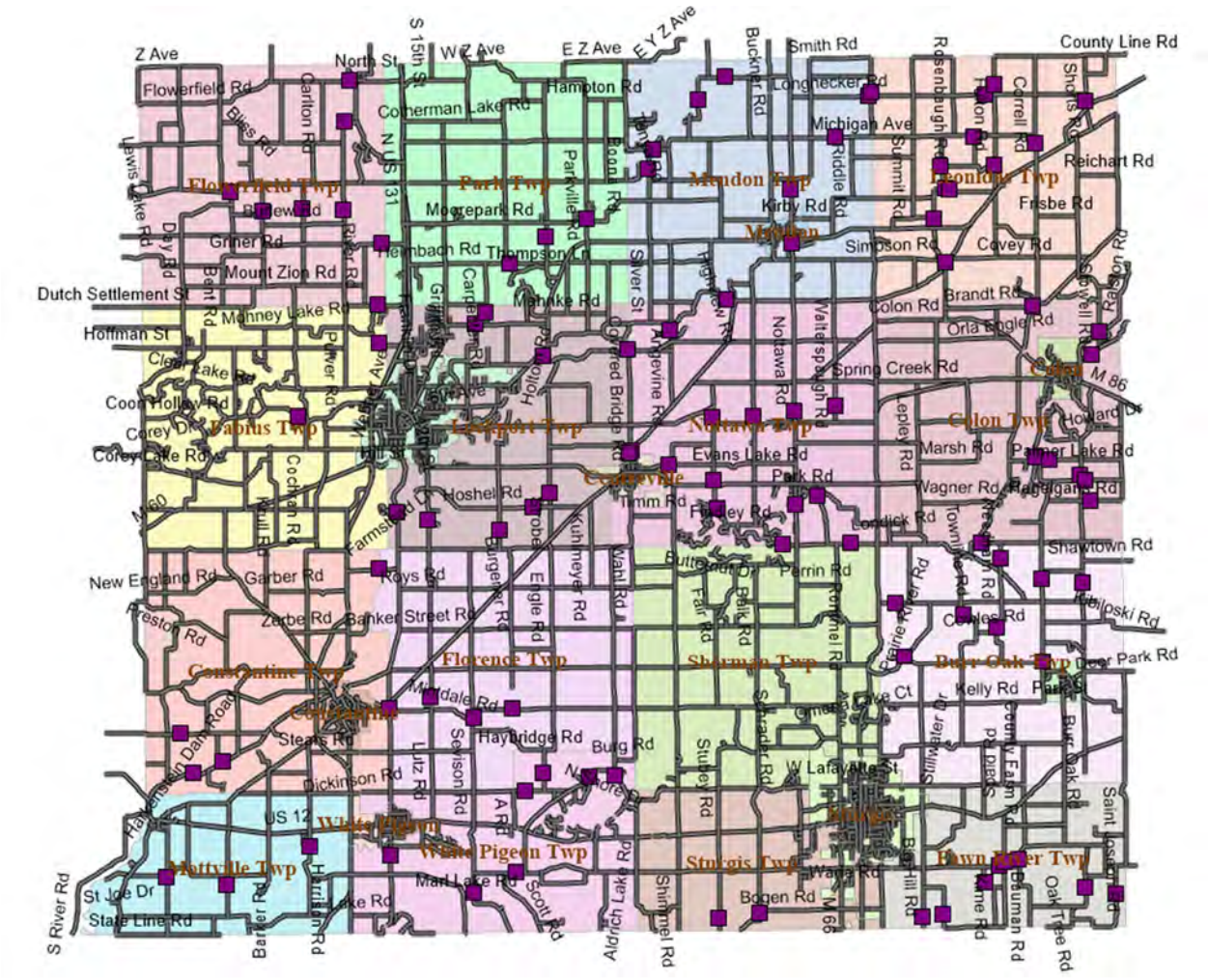


Figure 7 illustrates the locations of bridge assets owned by SJCRC. Details about the locations and sizes of each individual asset can be found in SJCRC's MiBRIDGE database. For more information, please refer to the agency contact listed in the *Introduction* of this bridge asset management plan.

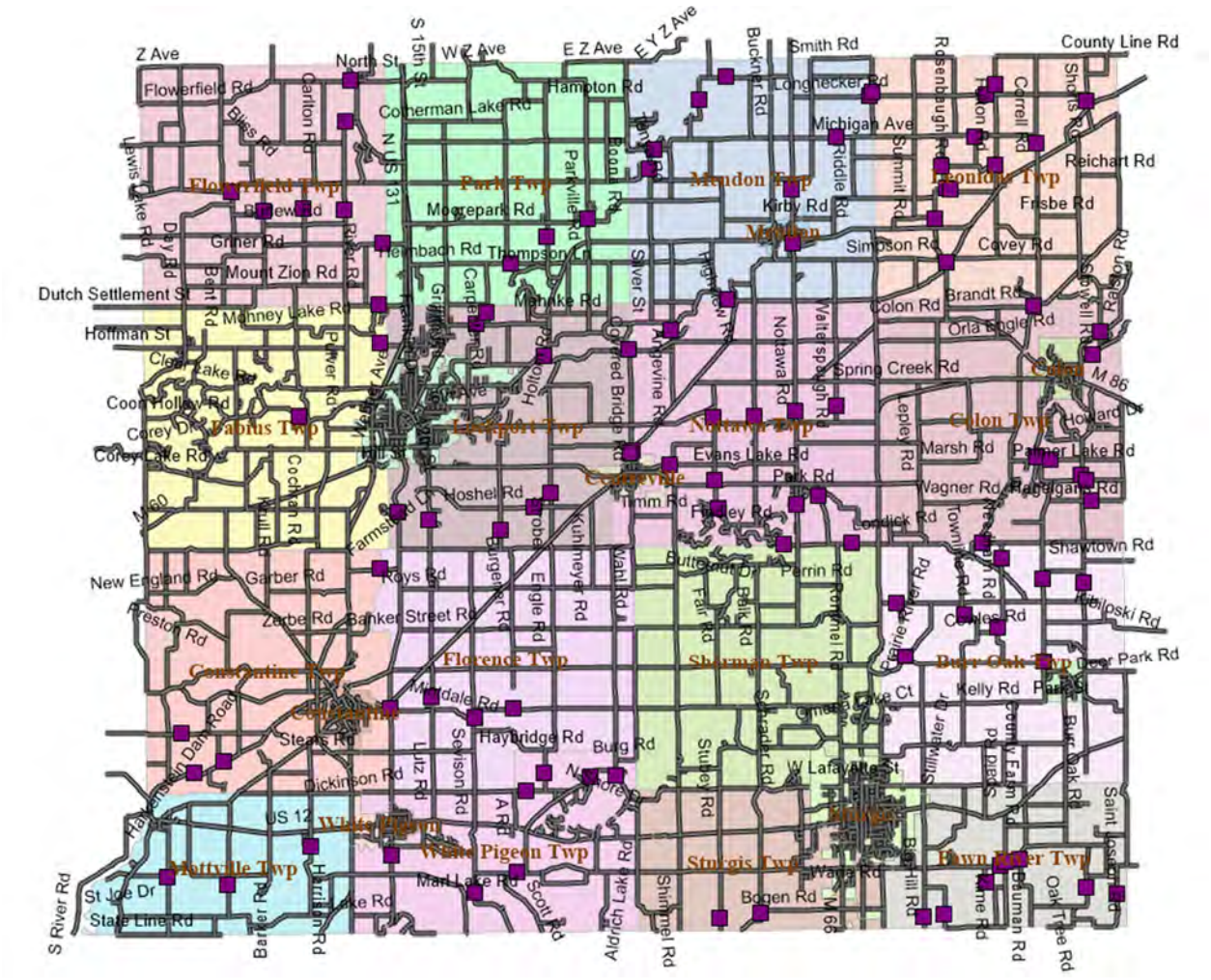


Figure 7: Map illustrating locations SJCRC's of bridge assets

Condition

SJCRC evaluates its bridges according to the National Bridge Inspection Standards rating scale, with a rating of 9 to 7 being like new to good condition, a rating of 6 and 5 being fair condition, and a rating of 4 or lower being poor or serious/critical condition. The current condition of SJCRC's bridge network is 36 (35.3%) are good, 52 (51.0%) are fair, and 14 (13.7%) are poor or lower.

Another layer of classification of SJCRC's bridge inventory classifies 14 (14%) bridges as structurally deficient, 21 (21%) bridges as posted, and 0 (0) bridges as closed. Structurally deficient bridges are those with a deck, superstructure, substructure, and/or culvert rated as "poor" according to the NBI rating scale, with a load-carrying capacity significantly below design standards, or with a waterway that regularly overtops the bridge during floods. Posted bridges are those that have declined in condition to a point where a restriction is necessary for what would be considered a safe vehicular or traffic load passing over the bridge; designating a bridge as "posted" has no influence on its condition rating. Closed bridges are

those that are closed to all traffic; closing a bridge is contingent upon its ability to carry a set minimum live load.

Table 2: Bridge Assets by Type: Inventory, Size, and Condition								
	Total Number of Bridges	Total Deck Area (sq ft)	Condition: Structurally Deficient, Posted, Closed			2025 Condition		
Bridge Type			**Struct. Defic**	**Posted**	**Closed**	**Poor**	**Fair**	**Good**
Prestressed Concrete I Beam	3	9,992	0	0	0	0	0	3
Prestressed Concrete Box Beam	33	119,585	0	4	0	1	12	20
Concrete Slab	1	1,312	0	0	0	0	0	1
Concrete Box	1	753	0	0	0	0	0	1
Timber Slab	51	94,458	12	16	0	12	32	7
Timber Stringer / Girder	2	2,026	0	2	0	0	2	0
Timber Box Culvert	1	792	0	0	0	0	1	0
Timber Truss / Steel Girder	1	4,502	0	1	0	0	1	0
Steel Stringer / Girder	2	3,291	0	0	0	0	2	0
Steel Culvert	4	2,483	1	0	0	1	3	0
Steel Tub Girder	2	7,915	0	0	0	0	1	1
Aluminum Culvert	1	2,168	0	0	0	0	0	1
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
Total SD/Posted/Closed			**13**	**23**	**0**			
Total	**102**	**249,277**				**14**	**54**	**34**
Percentage (%)			**12.7%**	**22.5%**	**0**	**13.7%**	**52.9%**	**33.3%**

Statewide, MDOT's statistics for local agency bridges show that 15% are poor and 85% are good/fair, indicating that the SJCRC has a lesser percentage of poor bridges compared to the statewide average for local agencies. Correspondingly, SJCRC has 86% of its bridges in fair/good condition versus the statewide average of 85% for local agency bridges. Statewide, 8% of local agency bridges classifies as structurally deficient compared to 12.7% of SJCRC's bridges.

Goals

The goal of SJCRC's asset management program is the preservation and safety of its bridge network; it also aims to extend the period of time that bridges remain in good and fair condition, thereby increasing their useful service life and reducing future maintenance costs.

Specifically, this goal translates into long-range goals of having 90% of its bridges rated fair/good and having less than 10% classify as structurally deficient within three years. These goals are juxtaposed with the historic and current condition and the projected trend in Figure 8.

Several metrics will be used to assess the effectiveness of this asset management program. SJCRC will monitor and report the annual change in the number of its bridges rated fair/good (5 or higher) and the annual change in the number of its bridges classified as structurally deficient.

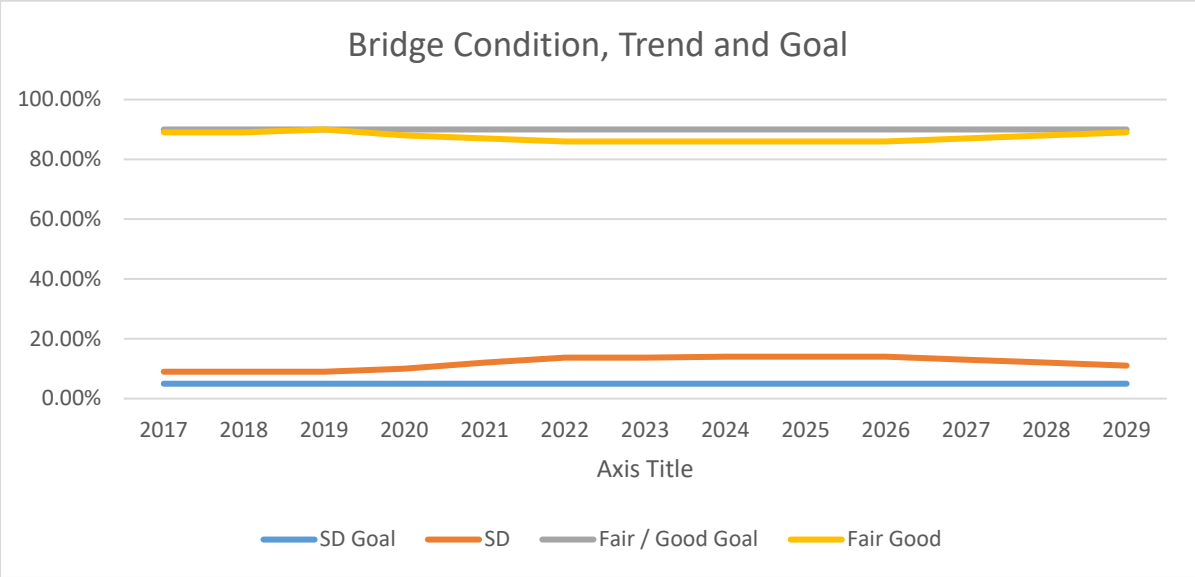


Figure 8: Progress tracking graph indicating SJCRC's historic and current bridge conditions, projected trends, and goals.

Based on past inspection records and condition ratings, SJCRC will establish a baseline of past performance by determining the average period of time that a bridge remains in good or fair condition. The performance measure will be the increased average amount of time a bridge is in the good or fair condition status after implementation of the asset management strategy when compared to the baseline time before implementation.

Prioritization, Programmed/Funded Projects, and Planned Projects

Prioritization

SJCRC's asset management program aims to address the structures of critical concern by targeting elements rated as being in poor condition and to improve and maintain the overall condition of the bridge network to good or fair condition through a "mix of fixes" strategy. Therefore, SJCRC prioritizes bridges for projects by evaluating five factors and weighting them as follows: condition –30%, load capacity –25%, traffic –25%, safety –15%, and detour –5%. There are several components within each factor that are used to arrive at its score. Each project under consideration is scored, and its total score is then compared with other proposed project to establish a priority order.

SJCRC annually reviews the current condition of each of the its bridges using the NBIS inspection data contained in the *MDOT Bridge Safety Inspection Report* and the inspector's work recommendations contained in MDOT's *Bridge Inspection Report*. The inspection inventory and condition data are consolidated in spreadsheet format for SJCRC's bridges in Appendix 3. SJCRC then determines management and preservation needs and corresponding actions for each bridge(Appendix 4) As well as inspection follow-up actions (Appendix 5). The management and preservation actions are selected in accordance with criteria contained in the *Summary of Preservation Criteria* table (below) and adapted to SJCRC's specific bridge network.

Table 3: Summary of Preservation Criteria

Preservation Action	Bridge Selection Criteria	Expected Service Life
Replacement		
Total Replacement	• NBI rating of 3 or less [1] [2] • *OR* Cost of rehabilitation exceeds cost of replacement [1] • *OR* Bridge is scour critical with no counter-measures available [1]	70 years
Rehabilitation		
Superstructure Replacement	• NBI rating of 4 or less for the superstructure [1] [2] • *OR* Cost of superstructure and deck rehabilitation exceeds cost of replacement [1]	40 years [1]
Deck Replacement Epoxy Coated Steel Black Steel	• Use guidelines in MDOT's Bridge Deck Preservation Matrix [3] [4] • NBI rating of 4 or less for the deck surface and deck bottom [1] [2] • Deck bottom has more than 25% total area with deficiencies [1] • *OR* Replacement cost of deck is competitive with rehabilitation [1]	60+ years [3] [4]
Substructure Replacement (Full or Partial)	• NBI rating of 4 or less for abutments, piers, or pier cap [1] [2] • Has open vertical cracks, signs of differential settlement, or active movement [1] • Pontis rating of 3 or 5 for more than 30 percent of the substructure [1] [5] • *OR* Bridge is scour critical with no counter-measures available	40 years [1*]
Steel Beam Repair	• More than 25% section loss in an area of the beam that affects load carrying capacity [1]	40 years [1*]

Table 3: Summary of Preservation Criteria		
Preservation Action	**Bridge Selection Criteria**	**Expected Service Life**
	• *OR* To correct impact damage that impairs beam strength [1]	
Prestressed Concrete Beam Repair	• More than 5% spalling at ends of prestressed I-beams [1] • *OR* Impact damage that impairs beam strength or exposes prestressing strands [1]	40 years [1*]
Substructure Concrete Patching and Repair	• NBI rating of 5 or 4 for abutments or piers, and surface has less than 30% area spalled and delaminated [1] [2] • *OR* Pontis rating of 3 or 4 for the column or pile extension, pier wall, and/or abutment wall and surface has between 2% and 30% area with deficiencies [1] [5] • *OR* In response to inspector's work recommendation for substructure patching [1]	
Abutment Repair/Replacement	• NBI rating of 4 or less for the abutment [1] [2] • *OR* Has open vertical cracks, signs of differential settlement, or active movement	
Railing/Barrier Replacement	• NBI rating greater than 5 for the deck [1] [2] • NBI rating less than 5 for the railing with more than 30% total area having deficiencies [1] [2] • *OR* Pontis rating is 4 for railing [1] [5] • *OR* Safety improvement is needed [1]	
Culvert Repair/Replacement	• NBI rating of 4 or less for culvert or drainage outlet structure • *OR* Has open vertical cracks, signs of deformation, movement, or differential settlement	
Preventive Maintenance		
Shallow Concrete Deck Overlay	• NBI rating is 5 or less for deck surface, and deck surface has more than 15% area with deficiencies [1] [2] • NBI rating of 4 or 5 for deck bottom, and deck bottom has between 5% and 30% area with deficiencies [1] [2] • *OR* In response to inspector's work recommendation [1]	12 years
Deep Concrete Deck Overlay	• NBI rating of 5 or less for deck surface, and deck surface has more than 15% area with deficiencies [1] [2] • NBI deck bottom rating is 5 or 6, and deck bottom has less than 10% area with deficiencies [1] [2] • *OR* In response to inspector's work recommendation [1]	25 years
HMA Overlay with Waterproofing Membrane	• NBI rating of 5 or less for deck surface, and both deck surface and bottom have between 15% and 30% area with deficiencies [1] [2] • *OR* Bridge is in poor condition and will be replaced in the near future and the most cost-effective fix is HMA overlay [1]	
HMA Overlay Cap without Membrane	• Note: All HMA caps should have membranes unless scheduled for replacement within five years. • NBI rating of 3 or less for deck surface and deck bottom, and deck surface and deck bottom have more than 30% area with deficiencies. Temporary holdover to improve ride quality for a bridge in the five-year plan for rehab/replacement. [1] [2]	3 years
Concrete Deck Patching	• NBI rating of 5, 6, or 7 for deck surface, and deck surface has between 2% and 5% area with delamination and spalling [1] [2] • *OR* In response to inspector's work recommendation [1]	5 years

Table 3: Summary of Preservation Criteria		
Preservation Action	**Bridge Selection Criteria**	**Expected Service Life**
Steel Bearing Repair/Replacement	• NBI rating of 5 or more for superstructure and deck, and NBI rating 4 or less for bearing [2]	
Deck Joint Replacement	• Always include when doing deep or shallow concrete overlays [1] • NBI rating of 4 or less for joints [1] [2] • *OR* Joint leaking heavily [1] • *OR* In response to inspector's work recommendation for replacement [1]	
Pin and Hanger Replacement	• NBI rating of 4 or less for superstructure for pins and hangers [1] [2] • Pontis rating of 1, 2, or 3 for a frozen or deformed pin and hanger [1] [5] • *OR* Presence of excessive section loss, severe pack rust, or out-of-plane distortion [1]	15 years
Zone Repainting	• NBI rating of 5 or 4 for paint condition, and paint has 3% to 15% total area failing [1] [2] • *OR* During routine maintenance on beam ends or pins and hangers [1] • *OR* less than 15% of existing paint area has failed and remainder of paint system is in good or fair condition [1]	10 years
Complete Repainting	• NBI rating of 3 or less for paint condition [1] [2] • *OR* Painted steel beams that have greater than 15% of the existing paint area failing [1]	
Partial Repainting	• See Zone or Spot Painting	
Channel Improvements	• Removal of vegetation, debris, or sediment from channel and banks to improve channel flow • *OR* in response to inspector's work recommendation	
Scour Countermeasures	• Pontis scour rating of 2 or 3 and is not scheduled for replacement [1] [5] • OR NBI comments in abutment and pier ratings indicate presence of scour holes [1] [2]	
Approach Repaving	• Approach pavement relief joints should be included in all projects that contain a significant amount of concrete roadway (in excess of 1000' adjacent to the structure). The purpose is to alleviate the effects of pavement growth that may cause distress to the structure. Signs of pavement growth include: o Abutment spalling under bearings [1] o Beam end contact [1] o Closed expansion joints and/or pin and hangers [1] o Damaged railing and deck fascia at joints [1] o Cracking in deck at reference line (45 degree angle) [1]	
Guard Rail Repair/Replacement	• Guard rail missing or damaged [2*] • *OR* Safety improvement is needed [2*]	
Scheduled Maintenance		
Superstructure Washing	• When salt contaminated dirt and debris collected on superstructure is causing corrosion or deterioration by trapping moisture [1] • *OR* Expansion or construction joints are to be replaced and the steel is not to be repainted [1]	2 years

Table 3: Summary of Preservation Criteria		
Preservation Action	**Bridge Selection Criteria**	**Expected Service Life**
	• *OR* Prior to a detailed replacement [1] • *OR* In response to inspector's work recommendation [1]	
Drainage System Clean-Out/Repair	• When drainage system is clogged with debris [1] • *OR* Drainage elements are broken, deteriorated, or damaged [1] • *OR* NBI rating comments for drainage system indicate need for cleaning or repair [1] [2]	2 years
Spot Repainting	• For zinc-based paint systems only. Do not spot paint with lead-based paints. • Less than 5% of paint area has failed in isolated areas [1] • *OR* In response to inspector's work recommendation [1]	5 years
Slope Paving Repair	• NBI rating is 5 or less for slope protection [1] [2] • *OR* Slope is degraded or sloughed • *OR* Slope paving has significant areas of distress, failure, or has settled [1]	
Riprap Installation	• To protect surface when erosion threatens the stability of side slopes of channel banks	
Vegetation Control	• When vegetation traps moisture on structural elements [1] • *OR* Vegetation is growing from joints or cracks [1] • *OR* In response to inspector's work recommendation for brush cut [1]	1 year
Debris Removal	• When vegetation, debris, or sediment accumulates on the structure or in the channel • *OR* In response to inspectors work recommendation	1 year
Deck Joint Repair	• Do not repair compression joint seals, assembly joint seals, steel armor expansions joints, and block out expansion joints; these should always be replaced. [1] • NBI rating is 5 for joint [1] [2] • *OR* In response to inspector's work recommendation for repair [1]	
Concrete Sealing	• Top surface of pier or abutments are below deck joints and, when contaminated with salt, salt can collect on the surface [1] • *OR* Surface of the concrete has heavy salt exposure. Horizontal surfaces of substructure elements are directly below expansion joints [1]	
Concrete Crack Sealing	• Concrete is in good or fair condition, and cracks extend to the depth of the steel reinforcement [1] • *OR* NBI rating of 5, 6, or 7 for deck surface, and deck surface has between 2% and 5% area with deficiencies [1] [2] • *OR* Unsealed cracks exist that are narrow and/or less than 1/8" wide and spaced more than 8' apart [1] • *OR* In response to inspector's work recommendation [1]	5 years
Minor Concrete Patching	• Repair minor delaminations and spalling that cover less than 30% of the concrete substructure [1] • *OR* NBI rating of 5 or 4 for abutments or piers, and comments indicate that their surface has less than 30% spalling or delamination [1] [2]	

Table 3: Summary of Preservation Criteria		
Preservation Action	**Bridge Selection Criteria**	**Expected Service Life**
	• *OR* Pontis rating of 3 or 4 for the column or pile extension, pier wall and/or abutment wall, and surface has between 2% and 30% area with deficiencies [1] [5] • *OR* In response to inspector's work recommendation [1]	
HMA Surface Repair/Replacement	• HMA surface is in poor condition • *OR* In response to inspector's work recommendation	
Seal HMA Cracks/Joints	• HMA surface is in good or fair condition, and cracks extend to the surface of the underlying slab or sub course • *OR* In response to inspector's work recommendation	
Timber Repair	• NBI rating of 4 or less for substructure for timber members • *OR* To repair extensive rot, checking, or insect infestation	
Miscellaneous Repair	• Uncategorized repairs in response to inspector's work recommendation	

This table was produced by TransSystems and includes information from the following sources:

[1] MDOT, *Project Scoping Manual*, MDOT, 2019.

[2] MDOT, *MDOT NBI Rating Guidelines*, MDOT, 2017.

[3] MDOT, *Bridge Deck Preservation Matrix - Decks with Uncoated "Black" Rebar*, MDOT, 2017.

[4] MDOT, *Bridge Deck Preservation Matrix - Decks with Epoxy Coated Rebar*, 2017.

[5] MDOT, *Pontis Bridge Inspection Manual*, MDOT, 2009.

* From source with interpretation added.

In terms of management and preservation actions, SJCRC's asset management program uses a "mix of fixes" strategy that is made up of replacement, rehabilitation, and preventive maintenance.

Replacement involves substantial changes to the existing structure, such as bridge deck replacement, superstructure replacement, or complete structure replacement, and is intended to improve critical or closed bridges to a good condition rating.

Rehabilitation is undertaken to extend the service life of existing bridges. The work will restore deficient bridges to a condition of structural or functional adequacy, and may include upgrading geometric features. Rehabilitation actions are intended to improve the poor or fair condition bridges to fair or good condition.

Preventive maintenance work will improve and extend the service life of fair bridges, and will be performed with the understanding that future rehabilitation or replacement projects will contain appropriate safety and geometric enhancements. Preventive maintenance projects are directed at limited bridge elements that are rated in fair condition with the intent of improving these elements to a good rating. Most preventive maintenance projects will be one-time actions in response to a condition state need. Routine preventive work will be performed by the agency's in-house maintenance crews.

SJCRC's **scheduled maintenance** program is an integral part of the preservation plan, and is intended to extend the service life of fair and good structures by preserving the bridges in their current condition for a longer period of time. Scheduled maintenance is proactive and not necessarily condition driven. In-house maintenance crews will perform much of this work.

Certain of the severely degraded and structurally deficient bridges require replacement or major rehabilitation. Several of the remaining bridges require one-time preventive maintenance actions to repair defects and restore the structure to a higher condition rating. Most bridges are included in a scheduled maintenance plan with appropriate maintenance actions programmed for groups of bridges of similar material and type, bundled by location.

The replacement, rehabilitation, and preventive maintenance projects are generally eligible for funding under the local bridge program, and any requests for funding will be submitted with St. Joseph County Road Commission's annual applications.

To achieve its goals, a primary objective of SJCRC's asset management program is improvement of bridges rated poor (4 or lower) to a rating of fair (5) or higher and/or preservation of bridges currently rated fair (5) or higher in their current condition within a three-year time period through management and/or preservation activities. A bridge-by-bridge preservation—or maintenance—plan is presented in the Appendix 4.

Programmed/Funded Projects

SJCRC received $4,870,000 in total funding per year for the years 2024-2026. To achieve its goals, SJCRC plans to spend $100,000 per year on preventive maintenance of bridges. By performing the aforementioned preventive maintenance and replacement of bridge structures, SJCRC will not meet its overall bridge network condition goals.

SJCRC computes the estimated cost of each typical management and/or preservation action using unit prices in the latest *Bridge Repair Cost Estimate* spreadsheet contained in MDOT's *Local Bridge Program Call for Projects*. The cost of items of varying complexity, such as maintenance of traffic, staged construction, scour counter-measures, and so forth, are computed on a bridge-by-bridge basis. The cost estimates are reviewed and updated annually. A summary of the programmed/funded projects and investments can be found in Table 4, the Cost Projection table, below.

Planned Projects

SJCRC identifies additional priority projects that remain unfunded. These are identified according to high, medium, and low priority in Table 4.

Table 4: Cost Projection Table

2026 – Replacement of SN 10324 – Farrand Road over St. Joseph River	$7,000,000
2027 – Replacement of SN 10289 – Fawn River Road over Fawn River	$1,620,000
2028 – Replacement of SN 10336 – Carls Road over Fawn River	$1,620,000

Gap Analysis

When SJCRC compares its funding and its programmed/funded projects with all of its prioritized projects as shown in Table 4, SJCRC believes it should be able to achieve some of its asset management goals for the period of this plan. Two Large Bridges over the St. Joseph River are going to be fixed as well as another larger bridge. There are several large bridges including Constantine Road Bridge over the St. Joseph River that do not have a funding mechanism for replacement at this point in time. For projects that it is unable to complete, SJCRC will continue to monitor those bridge assets and take any necessary steps within its budget to prevent or mitigate a condition decline or a need to post or close the structure.

2. FINANCIAL RESOURCES

Anticipated Revenues

SJCRC has programmed projects and/or has been granted MDOT local-aid funding for the purpose(s) of Rehabilitation maintenance for the following bridge(s): 10324. This funding is intended for use in the following funding year(s): 2026. Other programmed projects that have been granted from MDOT local-aid have been for the replacement of SN 10289 in the year 2027 and SN 10336 in the year 2028.

SJCRC applied for MDOT local-aid funding in 2026 for the purpose(s) of replacement, rehabilitation, and preventive maintenance for the following bridge(s): 10318, 10328 and 10358. This funding would be intended for use in the following funding year(s): 2026 SJCRC also applied for funding from several sources including, but not limited to MDOT local aid, a county appropriation of monies for bridge preservation, and federal programs.

Any projects submitted to the local aid program that are not selected for funding will be added to the agency’s program.

Anticipated Expenses

Scheduled maintenance activities and minor repairs that are not affiliated with any applications, grants, or other funded projects will be performed by the agency’s in-house maintenance forces and funded through the agency’s annual operating budget.

3. RISK MANAGEMENT

SJCRC recognizes that the potential risks associated with bridges generally fall into several categories:

- Personal injury and property damage resulting from a bridge collapse or partial failure;
- Loss of access to a region or individual properties resulting from bridge closures, restricted load postings, or extended outages for rehabilitation and repair activities; and
- Delays, congestion, and inconvenience due to serviceability issues, such as poor quality riding surface, loose expansion joints, or missing expansion joints.

SJCRC addresses these risks by implementing regular bridge inspections and a preservation strategy consisting of preventive maintenance.

SJCRC administers the biennial inspection of its bridges in accordance with NBIS and MDOT requirements. The inspection reports document the condition of SJCRC's bridges and evaluates them in order to identify new defects and monitor advancing deterioration. The summary inspection report in Appendix 1 identifies items needing follow-up, special inspection actions, and recommended bridge-by-bridge maintenance activities.

Bridges that are considered "scour critical" pose a risk to SJCRC's road and bridge network. Scour is the depletion of sediment from around the foundation elements of a bridge commonly caused by fast-moving water. According to MDOT's *Michigan Structure Inventory and Appraisal Coding Guide*, a scour critical bridge is one that has unstable abutment(s) and/or pier(s) due to observed or potential (based on an evaluation study) scour. Bridges receiving a scour rating of 3 or less are considered scour critical. SJCRC has scour critical bridges, which are listed in Table 5.

Table 5

Scour Critical Bridges	
Bridge Structure Number	**Scour Critical Rating**
10369	U
10370	U

SJCRC has posted or closed bridges that are critical to accessing entire areas or individual properties within its jurisdiction. These bridges are listed in Table 6. This list does not represent all posted bridges.

Table 6

Posted/Closed Bridges that are Critical Links		
Bridge Structure Number	**P/K**	**Comments**
10289	P	Scheduled for Replacement
10294	P	
10307	P	
10310	P	
10318	P	
10319	P	
10321	P	
10322	P	
10324	P	Scheduled for Replacement

The preservation strategy identifies actions in the operations and maintenance plan that are preventive or are responsive to specific bridge conditions. The actions are prioritized to correct critical structural safety and traffic issues first, and then to address other needs based on the operational importance of each bridge and the long-term preservation of the network. The inspection results serve as a basis for modifying and updating the operations and maintenance plan annually.

Appendix 1

St. Joseph County Road Commission [2025] Bridge Inspection Report Summary of Additional Inspection Recommendations

10289	Fawn River Road over Fawn River - Watch pier Pile 3S
10303	Bent Road over Rocky River – Watch south pier cap split
10306	Lutz Road over Fawn River – Watch cracks in beam bottoms
10309	Stroble Road over Prairie River – Watch deck boards for additional cracking
10320	North Burr Oak Road over Big Swan Creek – Watch gaps between box beams.
10324	Farrand Road over St. Joseph River – Watch cracked deck boards and spliced piles at North abutment.
10328	Blue School over White Pigeon River – Watch for additional cracked deck boards
10330	Sevison Road over White Pigeon River – Watch sheet pile wall in SE Quad
10341	Constantine Road over Fawn River – Watch timber piles in future
10344	Sevison Road over Fawn River – Watch pile 3W in pier 3S
10345	Findley Road over Prairie River – Watch south fascia. Monitor for backfill loss at east abutment
10351	McKale Road over Prairie River – Watch rotting abutment and pier piles
10352	Needham Road over Prairie River – Monitor abutment piles.
10358	Constantine Road over St. Joseph River – Watch pier piles and caps.
10359	Neaman Road over Prairie River – Watch cracks in beam bottoms.
10360	Carpenter Road over Portage River – Watch south pier cap, east fascia, south span.
10362	Findley Road over Prairie River – Recommended detailed inspection on pier caps 2026.
10369	Walterspaugh Road over Spring Creek – Watch beam 5W splice.
10381	McClish Road over Portage Creek – Watch split/spliced piles and abutment back undermining

Appendix 2

St. Joseph County Road Commission [2025] Bridge Inspection Report Executive Summary

10288 Fawn River Road over Fawn River

Constructed: [1954] **Reconstructed:** **General Condition:** [Fair]

Description: Functionally obsolete steel beam bridge with HMA deck, 1 pier and steel railings.

Recommendations:

Slope Repair – Place Riprap in front of abutments

Remove Debris – Remove tree from downstream channel

Railing Repair – Install thrie beam retrofit and approach guardrail

Joint Repair – Replace joint over pier

Deep Overlay – Concrete Overlay

Full Paint – Budget for steel painting

Superstructure Repair – Extend deck drains below beams

Substructure Repair – Seal joint under backwall

10289 Fawn River Road over Fawn River

Constructed: [1964] **Reconstructed:** **General Condition:** [Poor]

Description: Structurally deficient timber Slab with one pier, HMA deck and temporary support on the south. Posted for load at 23/31/57.

Recommendations:

Railing Repair – Install approach guardrail

Superstructure Repair – Post-Tension timber deck

Bridge Replacement – Scheduled for Replacement

10290 North River Road over Black Run River

Constructed: [2010] **Reconstructed:** **General Condition:** [Good]

Description: Single span prestressed concrete box beam, guardrail posts bolted into side of facia beam, HMA deck.

Recommendations:

Approach Repair – Add more wedge at reference line

Brush Cut – Cut brush in each quadrant

Remove Debris – Remove tree from downstream channel

Super Repair – Apply silane treatment to facias

Other – Remove sediment under approach guardrail

10291 Crooked Creek Road over Klinger Lake Outlet

Constructed: [1963] **Reconstructed:** **General Condition:** [Fair]

Description: Three celled timber box culvert with timber bottom.

Recommendations:

Slope Repair – Place riprap along SE slope and in NW quad

Railing Repair – Correct railing height at the North End

Other – Place riprap/grout bags at upstream apron

10292 Middle Colon Road over Prairie River

Constructed: [1964] **Reconstructed:** **General Condition:** [Fair]

Description: Timber slab with one pier and HMA deck.

Recommendations:

Approach Repair – Add shoulder gravel on north approach

Remove Debris – Remove debris from pier

Railing Repair – Install approach guardrail

Seal Cracks – Place new chipseal

Substructure Repair – Fill gaps in north abutment backwall boards

Other – Clean edges of deck

10293 S Fisher Lake Road over Portage River

Constructed: [2024] **Reconstructed:** **General Condition:** [Good]

Description: Spread prestressed box beam with one pier and concrete deck.

Recommendations:

Slope Repair – Wach or repair slope erosion in NE Quad

Floodcoat – Budget for epoxy overlay

10294 Dean Street over Prairie River

Constructed: [1967] **Reconstructed:** **General Condition:** [Fair]

Description: Timber slab with two piers and HMA deck with post tensioning load rated at 32/56/70

Recommendations:

Scour Repair – Place riprap along south abutment

Channel Repair – Place riprap along bank in SE quad.

Remove Debris – Remove brush from piers

Railing Repairs – Upgrade bridge rail and install approach guardrail

Superstructure Repair – Tighten loose post tensioning rod

Substructure Repair – Extend abutment backwall boards.

Other – Clean edge of deck

10295 Nottawa Road over St. Joseph River

Constructed: [1968] **Reconstructed:** **General Condition:** [Fair]

Description: Pile bent caisson prestressed concrete box beam bridge with 2 piers and HMA.

Recommendations:

Brush Cut –Cut brush in SE Quad

Remove Debris – Remove dead trees from channel

Joint Repair - Clean out expansion joints

Other – Clean out NW spillway

10296 Wattles Road over Creek

Constructed: [1950] **Reconstructed:** **General Condition:** [Fair]

Description: Steel Beam Single Span Bridge with wooden rail system behind concrete barrier wall.

Recommendations:

Brush Cut – Cut brush around bridge

Other – Remove debris from downstream channel

10297 Floating Bridge Road over Rocky River

Constructed: [2014] **Reconstructed:** **General Condition:** [Good]

Description: Single span prestressed concrete box beam bridge, concrete deck with tube rail guardrail system.

Recommendations:

Joint Repair – Reseal E3 joints

Floodcoat – Epoxy overlay deck

10298 Flowerfield Road over Flowerfield Creek

Constructed: [2009] **Reconstructed:** **General Condition:** [Good]

Description: Single span prestressed concrete box beam bridge, concrete deck with tube rail guardrail system.

Recommendations:

Approach Repair – Remove berm under guardrail to restore drainage

Seal Crack – Seal HMA cracking along abutment reference lines.

10299 Michigan Avenue over Portage River

Constructed: [1964] **Reconstructed:** **General Condition:** [Fair]

Description: Two span prestressed concrete box beam bridge, pile bent caissons with HMA deck.

Recommendations:

Railing Repair – Repair bridge and replace approach rails

Joint Replacement – Replace Joint

Seal Cracks – Seal HMA cracks over pier

Superstructure Repair – Patch south fascia beams

10300 Michigan Avenue over Portage River

Constructed: [1968] **Reconstructed:** **General Condition:** [Fair]

Description: Single Span timber beam bridge with HMA deck and 42 Ton weight limit

Recommendations:

Seal Cracks – Seal cracks in shoulder HMA

Bridge Replacement – Budget for Replacement

10301 Correll Road over Nottawa Creek

Constructed: [1967] **Reconstructed:** **General Condition:** [Fair]

Description: Three Span timber bridge with HMA deck with Post-tensioning added.

Recommendations:

Approach Repair – Add shoulder gravel

Slope Repair – Armor SE bank

Railing Repair – Install approach rail

Seal Cracks – Seal HMA cracks on the deck

Super Repair – Tighten post tensioning rods

Other – Add object markers in each quadrant

10302 Vistula Road over Pigeon River

Constructed: [1985] **Reconstructed:** **General Condition:** [Good]

Description: 2 span skewed prestressed concrete box beam bridge with pile bent caissons and HMA deck.

Recommendations:

Channel Repair – Place riprap along north abutment

Joint Repair – Blow out joint yearly, Budget for joint replacement

Seal Cracks – Seal Crack in HMA surface over bridge

10303 Bent Road over Rocky River

Constructed: [1981] **Reconstructed:** **General Condition:** [Fair]

Description: Three Span timber bridge with timber guardrail system and HMA deck.

Recommendations:

Approach Repair – Install approach rail

Brush Cut – Cut brush around bridge

Railing Repair – Upgrade bridge rail and approach guardrail

Joint Repair – Blow out joint yearly, budget for replacement

Deck Patching – Seal cracks in HMA surface

10304 Pulver Road over Rocky River

Constructed: [2014] **Reconstructed:** **General Condition:** [Good]

Description: Single span prestressed concrete box beam with concrete deck and tube rail guardrail system.

Recommendations:

Floodcoat – Budget for epoxy overlay

10305 Kalamazoo Street over Pigeon River

Constructed: [2019] **Reconstructed:** **General Condition:** [Good]

Description: Two span concrete box beam with concrete deck and tube rail guardrail system with pile bent pier.

Recommendations:

Railing Repair – Touch up pail posts with zinc-rich coating where galvanizing is missing

Joint Repair – Clean out reference joints and seal with rubber

Other – Clean edges of deck, approach curb, gutter and spillways.

10306 Lutz Road over Fawn River

Constructed: [1959] **Reconstructed:** **General Condition:** [Fair]

Description: Two span concrete box beam with HMA deck and thri-beam guardrail over decorative steel guardrail system.

Recommendations:

Scour Repair – Replace riprap at abutments and add riprap around pier

Appraoch repair – place HMA wedging on SE appraoch

Railing Repair – Replace rotting spacer blocks on west side

Seal Cracks – Seal crack over pier with rubber

Other – Clean off ends of pier. Remove sediment berms under approach guardrail.

10307 Lutz Road over Prairie River

Constructed: [2007] **Reconstructed:** **General Condition:** [Good]

Description: Two span concrete box beam with HMA deck and B rail guardrail system with pile bent pier load rated at 42/64/77

Recommendations:

Brush Cut – Cut bruch around bridge

Remove Debris – Remove tree debris from pier and downstream channel

Joint Repair – Clean out joint yearly

Zone Paint – Seal fascia beams

Other – Remove dirt from under approach guardrail

10308 Block Road over Sherman Mill Creek

Constructed: [1964] **Reconstructed:** **General Condition:** [Fair]

Description: Single Span timber with HMA deck and B rail.

Recommendations:

Scour Repair – Place riprap along abutments

Seal Cracks – Place chipseal

Substructure Repair – Seal gaps in abutment backwall boards

Other – Clean edges of deck

10309 Stroble Road over Prairie River

Constructed: [1967] **Reconstructed:** **General Condition:** [Fair]

Description: Three span timber bridge with B rail posted for load at 31/52/67

Recommendations:

Scour Repair – Add riprap or fabric along abutments to stop loss of backfill

Deck Patching – Seal HMA cracks

Other – Install approach rail and object marker signs

10310 Schweitzer Road over St. Joseph River

Constructed: [1977] **Reconstructed:** **General Condition:** [Fair]

Description: Four span concrete box beam with HMA deck and X-31A guardrail load rated at 42/55/64

Recommendations:

Channel Repair – Place riprap along south abutment on the north slope

Joint Repair – Clean out chipseal

Seal Cracks – Seal cracks in HMA over bridge

Other – Fix NB posting sign

10311 Klinger Lake Road over Sherman Mill Creek

Constructed: [2020] **Reconstructed:** **General Condition:** [Good]

Description: Concrete box culvert with tube rail.

Recommendations: None

10312 Parkville Road over Portage River

Constructed: [1961] **Reconstructed:** **General Condition:** [Fair]

Description: Two Span concrete box beam, HMA deck with caisson pier and B rail

Recommendations:

Remove Debris – Remove vegetation growing on pier

Railing Repair – Fix west bridge rail or replace complete railing

Joint Repair – Replace joint

Seal Cracks – Seal HMA deck cracks as needed

Superstructure Repair – Clean exposed strands and patch fascia beams

10313 Silver Street over Portage River

Constructed: [2015] **Reconstructed:** **General Condition:** [Good]

Description: Single Span concrete box beam with concrete deck and tube rail guardrail.

Recommendations:

Slope Repair - Repair NW quad washout

10314 Covered Bridge Road over St. Joseph River

Constructed: [1885] **Reconstructed:** [2023] **General Condition:** [Fair]

Description: Structurally deficient covered timber truss bridge with timber deck and steel beam substructure sitting on two concrete caisson piers load rated at 3 tons.

Recommendations:

Approach Repair – Add shoulder gravel under guardrail in NE quad.

Superstructure Repair – Install shims between bottom of deck and top of strings at each end.

10315 Clark Street over Prairie River

Constructed: [1967] **Reconstructed:** **General Condition:** [Good]

Description: Two span prestressed concrete box beam bridge with HMA deck and dual B rail guardrail system.

Recommendations:

Scour Repair – Add riprap at east end of south abutment

Remove Debris – Remove dead tree from downstream channel

Railing Repair – Upgrade bridge rail and replace approach guardrail

Substructure Repair– Seal HMA crack over pier

Other – Remove dirt and debris along edges of deck

10316 Nottawa Road over Prairie River

Constructed: [1963] **Reconstructed: [2022]** **General Condition:** [Fair]

Description: Two span press break steel tub girder bridge with HMA deck and tube guardrail system.

Recommendations:

Joint Repair – Clean out expansion joint over pier

Other – Remove dirt from NE spillway. Clean edges of deck and approach shoulders

10317 Nottawa Road over Spring Creek

Constructed: [1963] **Reconstructed:** **General Condition:** [Fair]

Description: Single span timber bridge with thri beam rail system and HMA deck.

Recommendations:

Channel Repair – Remove riprap from center of channel under bridge and place along abutments.

Approach Repair – Continue to wedge at north reference line

Slope Repair – Repair erosion in SE quadrant

Railing Repair – Replace approach guardrail

Seal Cracks – Seal cracks in HMA surface over bridge.

Other – Remove soil buildup in NE quad.

10318 Nottawa Road over Spring Creek

Constructed: [1966] **Reconstructed:** **General Condition:** [Poor]

Description: Structurally deficient skewed two span timber bridge with B rail system and HMA deck posted at 31-51-67

Recommendations:

Slope Repair – Place riprap in SE and SW quads.

Railing Repair – Replace railings and install approach guardrail

Substructure Repair – Repair splitting cap and pile in SE quadrant

Bridge Replacement – Budget to replace

Other – Repair culvert in NW quad

10319 Fawn River Road over Fawn River

Constructed: [1994] **Reconstructed:** **General Condition:** [Fair]

Description: Single span prestressed concrete box beam with b guardrail system and HMA deck posted for load at 42/58/67.

Recommendations:

Brush Cut – Cut brush on west side.

Slope Repair – Replace heavy riprap and fix north slope to prevent undermining of abutment

Joint Repair – Replace expansion joint at south end

Superstructure Repair – Apply silane treatment on fascia beams. Repair SE beam spall

10320 North Burr Oak Road over Big Swan Creek

Constructed: [1964] **Reconstructed:** **General Condition:** [Good]

Description: Single span prestressed concrete box beam with b guardrail system and HMA deck.

Recommendations:

Approach Repair – Add shoulder gravel under guardrail in NE quad.

Remove Debris – Remove debris in upstream and downstream channel

Railing Repair – Upgrade bridge rail and replace approach guardrail

Deck Patching – Patch spall in HMA surface at centerline.

10321 North Burr Oak Road over Little Swan Creek

Constructed: [1963] **Reconstructed:** **General Condition:** [Poor]

Description: Single span timber bridge with HMA deck and b guardrail system load rated at 33/54/71

Recommendations:

Remove Debris - Remove dead trees under bridge and in upstream channel

Railing Repair – Replace bridge rail and approach guardrail

Substructure Repair – Repair rotting abutment piles

Bridge Replacement – Budget for Replacement

10322 Bennett Road over St Joseph River

Constructed: [1972] **Reconstructed:** **General Condition:** [Poor]

Description: Three span prestressed concrete box beam with concrete caissons, HMA deck and dual b guardrail system posted for load at 42/54/64

Recommendations:

Brush Cut – Cut Brush in each quad

Slope Repair – Replace riprap at both slopes, SE and NE corner of deck where run-off is

Remove Debris – Remove log on north pier

Railing Repair – Upgrade bridge rail and replace approach guardrail.

Joint Replacement – Replace joints

Seal Cracks – place new chipseal

Superstructure Repair – Patch spalls in fascia beams

Substructure repair – Repair concrete pile cover

Other – Clean out joints, Remove sediment along approach guardrail and from top of piers.

10323 Fulton Road over Nottawa Creek

Constructed: [1958] **Reconstructed:** **General Condition:** [Fair]

Description: Two span prestressed concrete box beam with concrete caissons, HMA deck and thri beam guardrail over decorative steel railing.

Recommendations:

Joint Repair – Schedule joint replacement

HMA Overlay – Add waterproofing membrane

Superstructure Replacement – Drill holes in bottom of beams with cracks, drain water & seal cracks in bottom of box beams. At least in the fascia beams with leaking cracks

10324 Farrand Road over St. Joseph River

Constructed: [1965] **Reconstructed:** **General Condition:** [Poor]

Description: Structurally deficient 13 span timber bridge with b rail and HMA deck load rated at 30/59/65

Recommendations:

Remove Debris – Continue to check for debris buildup on piers and remove

Bridge Replacement – Scheduled for replacement in 2026

10325 Stowell Road over St. Joseph River

Constructed: [2010] **Reconstructed:** **General Condition:** [Good]

Description: Three span Prestressed concrete box beam on pile bents with HMA deck and b guardrail system.

Recommendations:

Approach Repair – Place wedging on approaches.

Brush Cut – Cut brush around bridge to ground level

Remove Debris – Remove dead trees upstream and downstream

Joint Repair – Clean out expansion joints

Super Repair – Apply silane treatment on fascia beams

Other – Clean edges of deck. Remove sediment under approach guardrail

10326 Heimbach Road over Portage River

Constructed: [1969] **Reconstructed:** **General Condition:** [Fair]

Description: Three span timber bridge with HMA surface and thri beam, retrofitted with post tensioning.

Recommendations:

Seal Cracks – Seal deck HMA cracks

Super Repair – Routinely tighten post-tensioning rods

10327 Thomas Street over White Pigeon River

Constructed: [1969] **Reconstructed:** **General Condition:** [Good]

Description: Two span prestressed concrete box beams on pile bents with HMA deck and b type guardrail system.

Recommendations:

Approach Repair – Wedge south approach.

Brush Cut – Continue to cut brush around bridge

Joint Repair – Clean out expansion joint once or twice per year. Investigate condition of joint seal for possible leakage

Seal Cracks – Continue to seal cracks in HMA surface over bridge

Superstructure Repair – Seal fascia beams

10328 Blue School Road over White Pigeon River

Constructed: [1978] **Reconstructed:** **General Condition:** [Poor]

Description: Structurally deficient four span timber bridge with HMA deck, timber guardrail system and load rated at 30/50/65.

Recommendations:

Approach Repair – Place HMA wedging at reference lines

Remove Debris – Remove dead tree from upstream channel

Railing Repair – Replace cracked/damaged railing panels. Install approach guardrail. Redrive anchors at north posts west rail.

Seal Cracks – seal cracks in HMA surface over bridge

Substructure Repair – Seal gaps in south abutment backwall boards. Repair sway bracing on piers.

Bridge Replacement – Budge for replacement

10329 Dickinson Road over Fawn River

Constructed: [1987] **Reconstructed:** **General Condition:** [Fair]

Description: Four span timber bridge with HMA deck and timber guardrail, load rated at 42/64/82

Recommendations:

Remove Debris – Remove debris from piers.

Railing Repair – Replace rotting south rail panels. Install approach guardrail

Seal Cracks – Place chip seal or mill and fill

10330 Sevison Road over White Pigeon River

Constructed: [1984] **Reconstructed:** **General Condition:** [Good]

Description: Two span prestressed concrete box beam on a pile bent pier with HMA surface and dual b rail guardrail system.

Recommendations:

Scour Repair – Grout under south abutment where bottom is exposed. Add riprap to prevent additional scour

Approach Repair – Add shoulder gravel in NW quad.

Remove Debris – Remove tree caught on pier, also debris under south span and in upstream channel.

Railing Repair – Replace missing bolts at pier. Replace approach guardrail

Joint Repair – Replace joint over pier

Other – Clean out CMP cross culver under south approach.

10331 Stubey Road over Fawn River

Constructed: [2001] **Reconstructed:** **General Condition:** [Fair]

Description: Two span timber with HMA surface and timber guardrail system

Recommendations:

Slope Repair – Repair hole in south behind SE wingwall

Railing Repair – Install approach guardrail

Seal Cracks – Seal cracks in HMA surface over bridge.

Substructure Repair – Extend south abutment backwall boards

10332 Balk Road over Fawn River

Constructed: [2009] **Reconstructed:** **General Condition:** [Poor]

Description: Two span prestressed concrete box beam on pile bent pier with HMA deck and b guardrail system posted for load at 42/54/64.

Recommendations:

Brush Cut – Cut brush around bridge.

Slope Repair - Replace riprap at both slopes, SE and NE corner of deck where run-off is eroding slope.

Remove Debris – Remove log and tree limbs on piers.

Railing Repair – Upgrade bridge rail and replace approach guardrail.

Joint Repair – Replace joints

Superstructure Repair – Patch spalls on bottom of east fascia beam.

Substructure Repair – Repair concrete pile cover

Other – Clean out joints. Remove sediment along approach guardrail and from top of piers.

10333 Miller Road over Fawn River

Constructed: [2017] **Reconstructed:** **General Condition:** [Good]

Description: Skewed single span prestressed concrete box beam with concrete deck and tube rail system.

Recommendations: None

Slope Repair – Place heavy riprap around spillway in SE quad.

Other – Remove dirt along shoulders.

10334 Big Hill Road over Fawn River

Constructed: [2007] **Reconstructed:** **General Condition:** [Good]

Description: Single span prestressed concrete box beam with HMA deck and b guardrail system

Recommendations:

Channel Repair – Replace riprap at north abutment

Slope Repair – Repair washout in NW quadrant

Superstructure Repair – Seal fascias.

10335 Kime Road over Fawn River

Constructed: [2012] **Reconstructed:** **General Condition:** [Good]

Description: Single span prestressed concrete I-beam with concrete deck and concrete barrier.

Recommendations:

Slope Repair – Remove excess gravel in NW quad and repair NE Slope

Joint Repair – Clean out expansion joint.

Seal Cracks – Seal cracks in fascia beams

10336 Carls Road over Fawn River

Constructed: [1964] **Reconstructed:** **General Condition:** [Fair]

Description: Two span timber bridge with HMA deck, b guardrail system and steel temporary support on the south posted at 42/58/76

Recommendations:

Scour Repair – Add fabric and riprap along north abutment.

Railing Repair – Replace bridge rail and install approach guardrail

Superstructure Repair – Post-tension deck in each span

Substructure Repair – Drive new piles along wingwalls

Bridge Replacement – Scheduled for 2028

Other – Install SB advance posting sign

10337 Watt Road over Fawn River

Constructed: [2004] **Reconstructed:** **General Condition:** [Good]

Description: Two span timber bridge with HMA deck and timber guardrail system

Recommendations:

Railing Repair – Install approach guardrail

Seal Cracks – Seal cracks in HMA surface over bridge.

Substructure Repair – Repair sway bracing on pier

Other – Clean edges of deck, open scuppers

10338 Halsey Road over Fawn River

Constructed: [2000] **Reconstructed:** **General Condition:** [Good]

Description: Skewed two span timber with HMA deck and timber rail system

Recommendations:

Approach Repair – Wedge/patch approaches

Remove Debris – Remove debris from pier

Railing Repairs – Add approach guardrail

HMA Overlay – Mill and fill HMA surface.

Substructure Repair – Repair gap in north abutment backwall boards. Add riprap along north abutment.

10339 Quaker Road over Mill Creek

Constructed: [1969] **Reconstructed:** **General Condition:** [Fair]

Description: Single span timber with HMA deck and b type guardrail load rated at 32/54/70

Recommendations:

Scour Repair – Add riprap along east abutment

Approach Repair – Continue to wedge as needed

Railing Repair – Reattach north rail. Budget for railing replacement. Install approach guardrail

HMA Overlay – Mill and Fill HMA surface

Substructure Repair – Extend abutment backwall boards

Bridge Replacement – Start budgeting for replacement.

10340 Withers Road over St. Joseph River

Constructed: [1979] **Reconstructed:** **General Condition:** [Fair]

Description: Four span prestressed concrete box beam bridge on pile bent piers with dual b guardrail system and HMA deck.

Recommendations:

Joint Repair – Clean out joints / replace

Zone Paint – Seal fascia beams

10341 Constantine Street over Fawn River

Constructed: [1965] **Reconstructed:** **General Condition:** [Fair]

Description: Three span timber with HMA deck, b guardrail system and post-tensioned

Recommendations:

Slope Repair – Repair erosion in SW quad

Railing Repair – Replace bridge rail and install approach guardrail

Superstructure Repair – Tighten nuts on Post Tension rods.

Substructure Repair – Repair SW wingwall

Bridge Replacement – Budget for replacement

10343 Mintdale Road over Ditch

Constructed: [1968] **Reconstructed:** **General Condition:** [Fair]

Description: Single span timber with HMA deck and b guardrail system load rated at 32/52/69

Recommendations:

Slope Repair – Fill in hole behind SE wingwall

Railing Repair – Install approach guardrail

HMA overlay – Mill and repave HMA surface

Substructure Repair – Drive sheeting behind abutments to stop loss of backfill under backwall boards and to prevent failure of wingwalls due to rotten piles.

Other – Clean edges of deck.

10344 Sevison Road over Fawn River

Constructed: [1983] **Reconstructed:** **General Condition:** [Fair]

Description: Four span timber bridge with HMA deck and timber guardrail

Recommendations:

Channel Repair – Place riprap at abutments.

Remove Debris – Remove log from under north span

Railing Repair – Replace rotting rail panel in south span. Install approach guardrail that meets current specs.

Seal Cracks – Seal cracks in HMA surface over bridge

Other – Clean edges of deck

10345 Findley Road over Prairie River

Constructed: [1979] **Reconstructed:** **General Condition:** [Poor]

Description: Three span timber bridge with HMA deck and timber guardrail

Recommendations:

Scour Repair – Remove riprap wier under east span and place riprap along abutment.

Approach Repair – Add shoulder gravel in NW quad

Brush Cut – Cut brush in NW quad

Remove Debris – Remove tree limbs from piers and tree trunk under west span

Railing Repair – Install new approach rail

HMA overlay – Mill and Fill HMA surface over bridge

Superstructure Repair – Replace rotten boards along south side of deck

Substructure Repair – Install new backwall repair at east abutment

10348 Hackman Road over Prairie River

Constructed: [1979] **Reconstructed:** **General Condition:** [Fair]

Description: Three span timber bridge with HMA deck and timber guardrail and Texas twist extensions off of timber rail

Recommendations:

Remove Debris – Remove debris from channel

Railing Repair – Install new approach guardrail

Other – Remove dirt and vegetation from ends of pier caps

10349 Townline Road over Big Swan Creek

Constructed: [1982] **Reconstructed:** **General Condition:** [Fair]

Description: Two span timber bridge with HMA deck and timber guardrail

Recommendations:

Remove Debris – Remove dead trees from downstream channel

Railing Repair – Install approach guardrail

Seal Cracks – Seal cracks in HMA

Superstructure Repair – Repair split in east span spreader beam

Substructure Repair – Replace NW wingwall cap. Fill gap at SE abutment corner.

Other – Clean edges of deck

10350 Prairie River Road over Prairie River

Constructed: [1967] **Reconstructed:** **General Condition:** [Poor]

Description: Two span timber bridge with HMA deck and b type guardrail load rated at 42/55/73

Recommendations:

Approach Repair – Continue to wedge approaches. Add shoulder gravel in SW quad

Slope Repair – Add fill and riprap in SW quad behind wingwall

Railing Repair – Install approach guardrail

Seal Cracks – Seal cracks in HMA surface over bridge

Substructure Repair – Extend abutment backwall boards

Other – Clean edges of deck

10351 McKale Road over Prairie River

Constructed: [1965] **Reconstructed:** **General Condition:** [Poor]

Description: Structurally deficient Two span timber bridge with HMA deck and b type guardrail

Recommendations:

Railing Repair – Install approach guardrail

Seal Cracks – Seal HMA cracks

Substructure Repair – Extend abutment backwall boards. Repair rotting abutment Piles. Cover gaps in wingwall boards

Other – Clean edges of deck

10352 Needham Road over Prairie River

Constructed: [1966] **Reconstructed:** **General Condition:** [Poor]

Description: Two span timber bridge with HMA deck and b type guardrail

Recommendations:

Railing Repair – Budget for railing replacement. Install approach guardrail

Substructure Repair – Repair gaps in abutment backwalls. Repair rotting abutment pile

10353 Needham Road over Big Swan Creek

Constructed: [2003] **Reconstructed:** **General Condition:** [Fair]

Description: Two span timber bridge with HMA deck and timber guardrail

Recommendations:

Scour Repair -Add riprap along north abutment

Remove Debris – Remove debris stuck on pier. Remove dead trees from upstream channel.

Railing Repair – Install approach guardrail

HMA Overlay – Remove HMA over bridge and resurface

Substructure Repair – Repair gap below north abutment backwall boards. Place shims under south abutment cap at pile 2W.

Other – Clean edges of deck. Install object marker sign at each end of east rail.

10354 Middle Colon Road over Big Swan Creek

Constructed: [2008] **Reconstructed:** **General Condition:** [Good]

Description: Single span timber bridge with HMA deck and timber guardrail

Recommendations:

Brush Cut – Cut brush around bridge

Railing Repair – Install approach guardrail

Seal Cracks – Seal cracks in HMA along edges

Substructure Repair – Install shims under north abutment cap at pile 1E

Other – Clean edges of deck

10355 Null Road over Rocky River

Constructed: [1966] **Reconstructed:** **General Condition:** [Fair]

Description: Two span timber bridge with HMA deck and b type guardrail

Recommendations:

Scour Repairs – Scour countermeasures needed at abutments to prevent loss of fill from behind backing boards. Steel Sheeting

Approach Repair – Wedge at abutments

Slope Repair – Fill holes in SW Quad

Railing Repair – Retrofit and install approach rail

10356 Cowling Road over Rocky River

Constructed: [1993] **Reconstructed:** **General Condition:** [Good]

Description: Three span prestressed concrete I beams on a curve with superelevation on pile bent piers with HMA deck and b type guardrail

Recommendations:

Railing Repair – Replace guardrail post in SE quadrant

Joint Repair – Clean out joint yearly.

10357 Hoshel Road over Prairie River

Constructed: [1976] **Reconstructed:** **General Condition:** [Fair]

Description: Four span timber bridge with HMA deck, timber guardrail and Texas twist guardrail approaches

Recommendations:

Brush Cut – Cut brush in NE quad

Remove Debris – Remove debris in downstream channel

Railing Repair – Update approach railing

Seal Cracks – Seal cracks in HMA along shoulders.

10358 Constantine Street over St. Joseph River

Constructed: [1972] **Reconstructed:** **General Condition:** [Poor]

Description: Structurally deficient 12 Span camel backed timber bridge with 15 degree skew, HMA deck and b guard rail system. Posted for load at 42/64/82

Recommendations:

Slope Repair – Repair erosion in SE quad along south abutment

Railing Repair – Replace section of rotten brush block west side.

Seal Cracks – Continue to seal HMA cracks

HMA overlay – Budget to mill and repave HMA

Bridge Replacement – Start budgeting for future replacement

10359 Neaman Road over Prairie River

Constructed: [2001] **Reconstructed:** **General Condition:** [Fair]

Description: 2 span skewed prestressed concrete box beam on pile bent piers with HMA deck and type b guardrail system.

Recommendations:

Brush Cut – Cut brush around bridge

Remove Debris – Remove tree debris from channel

Joint Repair – Place expansion joint device to stop leakage

Deck Patching – Seal cracks in bit or new chipseal

Superstructure Repair – Patch post tensioning pockets

Other – Seal fascia beams

10360 Carpenter Road over Portage River

Constructed: [1985] **Reconstructed:** **General Condition:** [Fair]

Description: 4 span timber with HMA deck and timber guardrail system

Recommendations:

Remove Debris – Clean shoulders and scuppers. Remove debris from under structure.

Railing Repair – Retrofit and install approach rail

Seal Cracks – Seal HMA Cracks

10361 Findley Road over Prairie River

Constructed: [1971] **Reconstructed:** **General Condition:** [Good]

Description: Two span concrete slab bridge in connection with the dam for water elevations of Lake Templene. Owned by the St. Joseph County Drain Commission.

Recommendations:

Approach Repair – Place wedging at reference lines.

Slope Repair – Place riprap at end of SE wingwall

Railing Repair – Install approach guardrail in NE and SE quad.

Seal Cracks – Seal cracks in concrete slab over pier.

10362 Findley Road over Prairie River

Constructed: [1972] **Reconstructed:** **General Condition:** [Poor]

Description: Five Span timber with HMA deck and b guardrail

Recommendations:

Detailed Inspection – Schedule detailed inspection of piers in 2026

Approach Repair – Install approach rail

Brush Cut – Cut tree in SE quad

Slope Repair – Repair slopes

Seal Cracks – Place new chip seal.

Substructure Repair – Fix gap between backwall boards and mudline at south abutment. Replace/retrofit south abutment pile 3W or reinforce cap.

10363 Truckenmiller Road over Prairie River

Constructed: [2002] **Reconstructed:** **General Condition:** [Good]

Description: Two span prestressed concrete box beam on pile bent pier with HMA deck and b guardrail system

Recommendations:

Channel Repair – Replace riprap along north half of east abutment

Brush Cut – Cut brush in all quads

Remove Debris – Remove dead tree from upstream channel. Remove from pier

Joint Repair – Blow out annually.

Other – Remove dirt under guardrail

10364 Rambadt Road over Prairie River

Constructed: [1971] **Reconstructed:** **General Condition:** [Fair]

Description: Two span timber with HMA deck and b guardrail system load rated at 31/51/67

Recommendations:

Approach Repair – Continue to wedge approaches. Fill hole in NW shoulder

Railing Repair – No approach guardrail

HMA overlay – Mill and fill HMA surface over bridge

Superstructure Repair – Fix gap between deck board along each edge. Consider Post-Tensioning deck.

Substructure Repair – Extend abutment backwall boards and fill gaps between boards. Repair south pier sway bracing.

10365 Rambadt Road over Spring Creek

Constructed: [1999] **Reconstructed:** **General Condition:** [Fair]

Description: Two span timber with HMA deck and timber guardrail

Recommendations:

Approach Repair – Continue to wedge approaches

HMA overlay – Mill and repave HMA surface over bridge

Substructure Repair – Extend abutment backwall boards. Repair damaged piles

10366 Angevine Road over St. Joseph River

Constructed: [1976] **Reconstructed:** **General Condition:** [Fair]

Description: Three span prestressed concrete box beam on pile bent piers with HMA deck and X-31A guardrail system

Recommendations:

Railing Repair – Replace missing tube rail splice bolts and missing nut on anchor bolt.

Joint Repair – Clean out joints yearly

Crack Seal – Seal HMA cracks near centerline

Superstructure Repair – Repair cracks in fascia beams. Patch spalls on bottom of beams

Substructure Repair – Repair concrete pile encasement on south pier

10367 Bucknell Road over Spring Creek

Constructed: [2008] **Reconstructed:** **General Condition:** [Fair]

Description: Skewed single span timber with HMA deck and timber guardrail

Recommendations:

Scour Repair – Place riprap along abutments

Brush Cut – Cut brush around bridge

Remove Debris – Remove debris in downstream channel

HMA Overlay – Remove HMA and resurface

Substructure Repair – Extend backwall boards.

10368 Filmore Road over Prairie River

Constructed: [1970] **Reconstructed:** **General Condition:** [Fair]

Description: Three span timber with HMA deck and b type guardrail

Recommendations:

Approach Repair – Place wedging on approaches

Remove Debris – Remove debris from piers

Railing Repair – Install approach guardrail. Place object marker signs.

Deck Patching – Seal deck cracks

Seal Crack – Seal Cracks over Bridge

Substructure Repair – Extend north abutment backwall boards below stream bottom

Other – Clean edges of deck

10369 Walterspaugh Road over Spring Creek

Constructed: [1901] **Reconstructed:** **General Condition:** [Serious]

Description: Scour critical, functionally obsolete, single span steel bridge on masonry abutments with b guardrail load rated at 6 tons (not technically a bridge)

Recommendations:

Brush Cut – Cut brush around bridge

Railing Repair – Replace bridge rail and install approach guardrail

Bridge Washing – Remove dirt from top of abutments

Shallow Overlay – Place new bituminous wearing surface

Bridge Replacement – Budge for Replacement

10370 Hagelgans Road over Washburn Creek

Constructed: [1909] **Reconstructed:**[1996] **General Condition:** [Fair]

Description: Scour Critical single span timber on concrete abutments, HMA deck and timber guardrail

Recommendations:

Scour Repair – Add riprap along abutments

Remove Debris – Remove debris from channel

Railing Repair – Install approach guardrail

HMA Overlay – Mill and Fill HMA surface

Substructure Repair – Patch abutment spalls

Other – Clean edges of deck. Replace object marker signs in NW & NE quad

10371 Custer Road over Washburn Creek

Constructed: [2009] **Reconstructed:** **General Condition:** [Good]

Description: Single Span timber, HMA deck and timber guardrail

Recommendations:

Slope Repair – Place riprap on NE slope

Remove Debris – Remove dead trees and limbs from channel

HMA Overlay – Budget for a Mill and Fill

Substructure Repair – Place shims on piles in west abutment where cap does not have full bearing

Other – Remove barbed wire at upstream face

10372 Decker Road over Lake Channel

Constructed: [2015] **Reconstructed:** **General Condition:** [Good]

Description: Single span prestressed concrete box beam with concrete deck and two tube guardrail.

Recommendations:

Brush Cut – Cut brush in NW and SW quad. Remove tree frowing in joint between SE slopewall and fascia

Floodseal – Place epoxy overlay on deck.

Other – Remove dirt from shoulders. Clean out NW spillway.

10373 Decker Road over Lake Channel

Constructed: [2017] **Reconstructed:** **General Condition:** [Good]

Description: Single span prestressed concrete box beam with concrete deck and two tube guardrail.

Recommendations:

Joint Repair – Reseal E3 joints

Floodcoat – Place epoxy overlay

Other – Remove dirt from shoulders and spillways.

10374 Delong Road over Rocky River

Constructed: [2001] **Reconstructed:** **General Condition:** [Good]

Description: Single span timber with HMA deck and timber guardrail

Recommendations:

Approach Repair – Replace missing object marker sign in the SE corner

Railing Repair – Investigate need for approach rail

Deck Patching – Seal HMA deck cracks

10375 Flatbush Road over Rocky River

Constructed: [1963] **Reconstructed:** **General Condition:** [Fair]

Description: Two span timber with HMA deck and type b guardrail. Posted at 31/51/67

Recommendations:

Scour Repair – Place steel sheeting hehind north abutment or add riprap to prevent scour

Deck Patching – Seal HMA deck cracks, clean off shoulders

Other – Monitor north abutment scour protection

10376 North Fisher Road over Portage River

Constructed: [1986] **Reconstructed:** **General Condition:** [Fair]

Description: Skewed four span prestressed concrete box beam with HMA deck and dual b guardrail

Recommendations:

Joint Repair – Blow out joints annually

Seal Cracks – Seal HMA cracks

Zone Paint – Seal beam ends each fascia

10377 Prairie Corners Road over St. Joseph River

Constructed: [2026] **Reconstructed:** **General Condition:** [Good]

Description: Three span press break steel tub girder with concrete deck and aesthetic parapet railing

Recommendations:

None

10378 Flach Road over Butternut Creek

Constructed: [1986] **Reconstructed:** **General Condition:** [Fair]

Description: Single span timber with HMA deck and timber guardrail

Recommendations:

Scour Repair – Add riprap along abutment to prevent further loss of approach fill

Slope Repair – Fill hole in SE quad

Railing Repair – Hammer in rail anchors to close gaps in deck fascia. Install approach rail

Seal Cracks – Seal HMA cracks on deck, add wedging to southwest approach

10379 Longnecker Road over Little Portage River

Constructed: [2008] **Reconstructed:** **General Condition:** [Good]

Description: Skewed single span prestressed concrete box beam, HMA deck and X-31A guardrail

Recommendations:

Railing Repair – Replace missing anchor nuts, post 1E north rail

Deck Patching – Seal HMA cracks on deck

Seal Cracks – Seal fascia beams with sealer

10380 Hallum Road over Butternut Creek

Constructed: [1998] **Reconstructed:** **General Condition:** [Good]

Description: Skewed two span timber with HMA deck and timber guardrail

Recommendations:

Remove Debris – Remove brush piled under each span by beavers

Railing Repair – Install approach rail

Seal Cracks – Seal cracks in HMA

10381 McClish Road over Portage River

Constructed: [1968] **Reconstructed:** **General Condition:** [Fair]

Description: Skewed single span timber stringer with HMA deck and b type guardrail load rated at 42 tons

Recommendations:

Railing Repair – Retrofit and install approach rail

Seal Cracks – Seal HMA cracks

Bridge Replacement – Replace Bridge

10382 Kings Mill Road over Mill Race

Constructed: [1906] **Reconstructed:**[1981] **General Condition:** [Poor]

Description: Functionally obsolete single span timber on masonry abutments, HMA deck and timber guardrail with b type approach rails. Posted for load at 30 tons.

Recommendations:

Railing Repair – Replace approach railing

Substructure Repair – Replace missing mortar at abutments

Replace missing object marker in the NW quad, reset the others.

10383 Kings Mill Road over Nottawa Creek

Constructed: [1977] **Reconstructed:** **General Condition:** [Fair]

Description: Four span timber with HMA deck and timber guardrail with Texas twist approaches.

Recommendations:

Scour Repair – Add abutment backing repair

Approach Repair – Wedge HMA each end of bridge

Railing Repair – Install new approach rail and bridge rail

Seal Cracks – Continue sealing deck HMA cracks

10384 Olney Road over Nottawa Creek

Constructed: [1984] **Reconstructed:** **General Condition:** [Fair]

Description: Four span timber with HMA deck and timber guardrail

Recommendations:

Approach Repair – Install new approach rail

HMA Overlay – Repave deck and add waterproofing

Super Repair – Add a post-tension system or spreaders to lessen HMA cracking

10385 Lawrence Road over Bear Creek

Constructed: [2005] **Reconstructed:** **General Condition:** [Good]

Description: Single span timber with HMA deck and timber guardrail

Recommendations:

Railing Repair – Install new approach rail

Seal Cracks – Seal HMA cracks, wedge at abutments

10386 Shorts Road over Bear Creek

Constructed: [1967] **Reconstructed:** **General Condition:** [Fair]

Description: Three span timber with HMA deck and b type guardrail and post-tension system.

Recommendations:

Approach Repair – Wedge at shoulders

Railing Repair – Retrofit and place new approach rails

Seal Cracks – Seal HMA cracks

13850 North River Road over Mill Creek

Constructed: [2015] **Reconstructed:** **General Condition:** [Good]

Description: Prestressed Concrete Box Beam, single span and steel tube guardrail.

Recommendations:

Brush Cut – Cut small trees in each quad

Joint Repair – Clean out expansion joint once or twice per year

Deck Patching – Patch spall in NE desk fascia, allow for expansion movement

Seal Cracks – Seal Deck Cracks

Other – Remove Sediment from downspouts

14344 Coon Hollow Road over Bear Creek

Constructed: [1935] **Reconstructed:**[2020] **General Condition:** [Fair]

Description: Skewed timber single span on masonry abutments with timber railing and b type approach rail (not technically a bridge)

Recommendations:

Approach Repair – Add shoulder gravel in NW quad

Slope Repair – Add rock to steep slopes

Railing Repair – Replace NE guardrail ending

14529 Lawrence Road over Bear Creek

Constructed: [1969] **Reconstructed:** **General Condition:** [Fair]

Description: Four Steel Culverts

Recommendations:

Culvert Replacement – Begin budgeting for replacement with longer structure

14530 Longnecker Road over Bear Creek

Constructed: [1969] **Reconstructed:** **General Condition:** [Serious]

Description: Four Steel Culverts

Recommendations:

Remove Debris – Remove tree limbs as they catch on the inlets

Culvert Replacement – Start budgeting for replacement

14531 Fulton Road over Bear Creek

Constructed: [1969] **Reconstructed:** **General Condition:** [Fair]

Description: Three Steel Culverts

Recommendations:

Remove Debris – Remove trees from inlet

14532 Pulver Road over Flowerfield Creek

Constructed: [1969] **Reconstructed:** **General Condition:** [Fair]

Description: Three Steel Culverts

Recommendations:

Slope Repair – Armor north slope

Remove Debris – Clean out beaver damming in the two end barrels

Railing Repair – Replace the guardrail along each side

14592 Shimmel Road over Sherman Mill Creek

Constructed: [2022] **Reconstructed:** **General Condition:** [Good]

Description: Aluminum Culvert

Recommendations:

Other – Remove silt fence

14698 Stowel Road over Bear Creek

Constructed: [1970] **Reconstructed:** **General Condition:** [Fair]

Description: Timber box culvert with two bays (not technically a bridge)

Recommendations:

Scour Repair – Place riprap in scour hole at outlet

Slope Repair – Place riprap on slope outside of each wingwall

Remove Debriis – Remove dead tree from upstream channel

Substructure Repair – Repair NW wingwall

Culvert Replacement – Budget for replacement with a larger structure.

Appendix 3

Inventory Data												Inspection Findings													Appraisal					
Struct. Nbr.	Bridge ID	Facility Carried	Features Intersected	Structure Type 43A	Structure Type 43B	Number of Main Spans	Year Built	Year Recon	Primary Local	Township	ADT	Year of ADT	Insp. Date	Operational Status (Item 41)	Load Rating	Deck Rating	Deck Bottom Rating	SuperStr Rating	Substr Rating	Channel Rating	Culvert Rating	Surface Rating	Paint Rating	Exp Joint Rating	Other Joints	Structure Evaluation	Structurally Deficient	Functionally Obsolete	Sufficiency Rating	Section Loss	Scour Critical
Concrete I Beams																														
10335	78304H00019B010	Kime Road	Fawn River	Prestressed Conc	Stringer/Girder	1	2012		Local	Fawn River	334	2010	11/24/2025	A		8	7	7	8	7	NA	8	NA	7	7	7 Good	N	N		3	5
10356	78309H00056B010	Cowling Road	Rocky River	Prestressed Conc	Stringer/Girder	3	1993		Local	Fabius	146	2021	11/06/2025	A		8	8	8	7	7	NA	8	NA	6	NA	7 Good	N	N		3	5
13850	78200005000B020	North River Road	Mill Creek	Prestressed Conc	Stringer/Girder	1	2015		Primary	Constantine	3321	2022	11/07/2023	A		7	7	8	7	6	NA	8	NA	8	8	7 Good	N	N		3	5
Concrete Box Beams																														
10290	78200005000B010	North River Road	Black Run River	Prestressed Conc	Mult Box Beam	1	2010		Primary	Constantine	3321	2022	11/13/2025	A		8	NA	7	8	6	NA	8	NA	NA	NA	7 Good	N	N		3	5
10293	78200024000B010	S Fisher Lake Road	Portage River	Prestressed Conc	Sinlge / Spread	2	2024		Primary	Lockport	862	2018	11/06/2025	A		8	7	8	8	5	NA	8	NA	8	7	8 Good	N	N		3	8
10295	78200025000B020	Nottawa Road	St Joseph River	Prestressed Conc	Mult Box Beam	3	1968		Primary (FAS)	Mendon	2701	2019	11/24/2025	A		6	NA	6	5	6	NA	7	NA	7	NA	5 Fair	N	N		2 < 10% LOS	5
10297	78200028000B010	Floating Bridge Road	Rocky River	Prestressed Conc	Mult Box Beam	1	2014		Primary	Flowerfield	143	2018	11/06/2025	A		7	NA	8	8	6	NA	7	NA	6	NA	7 Good	N	N		3	5
10298	78200030000B010	Flowerfield Road	Flowerfield Creek	Prestressed Conc	Mult Box Beam	1	2009		Primary (FAS)	Flowerfield	432	2018	11/04/2025	A		7	NA	7	8	6	NA	7	NA	NA	NA	7 Good	N	N		3	5
10299	78200032000B010	Michigan Avenue	Portage River	Prestressed Conc	Mult Box Beam	2	1964		Primary (FAS)	Mendon	842	2019	11/07/2025	A		5	NA	5	7	7	NA	6	NA	NA	5	5 Fair	N	N		3	5
10302	78200033000B010	Vistula Road	White Pigeon River	Prestressed Conc	Mult Box Beam	2	1985		Primary (FAS)	Mottville	569	2022	11/13/2025	A		7	NA	8	7	5	NA	5	NA	5	NA	7 Good	N	N		NA	5
10304	78200040000B010	Pulver Road	Rocky River	Prestressed Conc	Mult Box Beam	1	2014		Primary	Flowerfield	516	2011	11/06/2025	A		8	NA	8	8	8	NA	7	NA	7	NA	8 Good	N	N		3	5
10305	78200042000B010	Kalamazoo Street	White Pigeon River	Prestressed Conc	Mult Box Beam	2	2019		Primary	White Pigeon	1030	2022	11/21/2025	A		8	NA	8	8	7	NA	8	NA	5	NA	8 Good	N	N		NA	5
10306	78200044000B010	Lutz Road	Fawn River	Prestressed Conc	Mult Box Beam	2	1959		Primary	Florence	3889	2019	11/21/2025	A		6	NA	6	7	6	NA	7	NA	5	NA	6 Fair	N	N		NA	5
10307	78200044000B020	Lutz Road	Prairie River	Prestressed Conc	Mult Box Beam	2	2007		Primary	Lockport	3586	2019	11/04/2025	P	42 / 58 / 82	8	NA	7	7	6	NA	8	NA	7	NA	7 Good	N	N		NA	
10310	78200045000B030	Schweitzer Road	St Joseph River	Prestressed Conc	Mult Box Beam	4	1977		Primary (FAS)	Lockport	1060	2012	11/24/2025	P	42 / 55 / 64	5	NA	5	6	5	NA	6	NA	7	NA	5 Fair	N	N		2 < 10% LOS	5
10312	78200049000B010	Parkville Road	Portage River	Prestressed Conc	Mult Box Beam	2	1961		Primary	Park	1127	2018	11/06/2025	A		5	NA	5	7	6	NA	7	NA	NA	4	5 Fair	N	N		3	5
10313	78200050000B010	Silver Street	Portage River	Prestressed Conc	Mult Box Beam	1	2015		Primary (FAS)	Mendon	3265	2018	11/07/2025	A		8	NA	8	8	7	NA	8	NA	7	NA	8 Good	N	N		3	5
10315	78200050000B030	Clark Street	Prairie River	Prestressed Conc	Mult Box Beam	2	1967		Primary (FAS)	Nottawa	1881	2018	11/06/2025	A		7	NA	7	6	6	NA	8	NA	6	NA	6 Fair	N	N		NA	5
10319	78200055000B010	Fawn River Road	Fawn River	Prestressed Conc	Mult Box Beam	1	1995		Primary (FAS)	Fawn River	615	2012	11/24/2025	P	42 / 58 / 67	6	NA	5	6	4	NA	6	NA	4	NA	5 Fair	N	N		NA	5
10320	78200058000B010	North Burr Oak Road	Big Swan Creek	Prestressed Conc	Mult Box Beam	1	1964		Primary (FAS)	Burr Oak	872	2022	11/04/2025	A		7	NA	7	7	6	NA	7	NA	NA	NA	7 Good	N	N		NA	5
10322	78200059000B010	Bennett	St Joseph River	Prestressed Conc	Mult Box Beam	3	1972		Primary	Leonidas	381	2010	11/24/2025	P	42 / 54 / 64	4	NA	4	5	5	NA	6	NA	5	NA	4 Poor	N	N		3	5
10323	78200060000B010	Fulton Road	Nottawa Creek	Prestressed Conc	Mult Box Beam	2	1958		Primary (FAS)	Leonidas	835	2019	11/14/2025	A		5	NA	6	7	7	NA	7	NA	NA	6	5 Fair	N	N		3	5
10325	78200061000B010	Stowell Road	St Joseph River	Prestressed Conc	Mult Box Beam	3	2010		Primary	Colon	581	2016	11/24/2025	A		7	NA	7	8	7	NA	7	NA	7	NA	7 Good	N	N		2 < 10% LOS	5
10327	78301B00012B010	Thomas Street	White Pigeon River	Prestressed Conc	Mult Box Beam	2	2003		Local	Mottville	416	2011	11/13/2025	A		7	NA	7	8	7	NA	6	NA	6	NA	7 Good	N	N		NA	5
10330	78302A00026B010	Sevison Road	White Pigeon River	Prestressed Conc	Mult Box Beam	2	1984		Local	White Pigeon	563	2010	11/13/2025	A		7	NA	7	7	5	NA	7	NA	4	NA	7 Good	N	N		NA	5
10332	78303H00021B010	Balk Road	Fawn River	Prestressed Conc	Mult Box Beam	2	2009		Local	Sturgis	51	2011	11/21/2025	A		7	NA	7	8	5	NA	7	NA	6	NA	7 Good	N	N		NA	5
10333	78304H00001B010	Miller Road	Fawn River	Prestressed Conc	Mult Box Beam	3	1965		Local	Fawn River	326	2000	11/24/2025	A		8	NA	8	8	8	NA	7	NA	5	NA	8 Good	N	N		NA	5
10334	78304H00014B010	Big Hill Road	Fawn River	Prestressed Conc	Mult Box Beam	1	2007		Local	Fawn River	89	2011	11/24/2025	A		7	NA	7	7	5	NA	7	NA	NA	NA	7 Good	N	N		NA	5
10340	78305H00017B010	Withers Road	St Joseph River	Prestressed Conc	Mult Box Beam	4	1979		Local	Constantine	774	2019	11/04/2025	A		6	NA	6	7	8	NA	6	NA	5	5	6 Fair	N	N		2 < 10% LOS	5
10359	78310H00026B010	Neaman Road	Prairie River	Prestressed Conc	Mult Box Beam	2	2001		Local	Lockport	115	2000	11/04/2025	A		6	NA	6	7	6	NA	6	NA	6	NA	6 Fair	N	N		2 < 10% LOS	5
10363	78311A00005B010	Truckenmiller Road	Prairie River	Prestressed Conc	Mult Box Beam	2	2002		Local	Lockport	232	2011	11/06/2026	A		7	NA	7	7	5	NA	8	NA	6	NA	7 Good	N	N		3	5
10366	78311A00034B010	Angevine Road	St Joseph River	Prestressed Conc	Mult Box Beam	3	1976		Local (FAS)	Nottawa	681	2018	11/24/2025	A		5	NA	5	5	7	NA	6	NA	6	6	5 Fair	N	N		2 < 10% LOS	5
10372	78312H00014B010	Decker Road	Lake Channel	Prestressed Conc	Mult Box Beam	1	2015		Local	Colon	542	2010	11/04/2025	A		8	NA	8	8	8	NA	8	NA	6	NA	8 Good	N	N		NA	5
10373	78312H00015B010	Decker Road	Washburn Creek	Prestressed Conc	Mult Box Beam	1	2017		Local	Colon	297	2010	11/04/2025	A		8	NA	8	8	8	NA	8	NA	6	NA	8 Good	N	N		NA	8
10376	78314H00032B010	N Fisher Lake Road	Portage River	Prestressed Conc	Mult Box Beam	4	1986		Local	Park	221	2021	11/06/2025	A		7	NA	6	7	6	NA	6	NA	7	6	6 Fair	N	N		3	5
10379	78315H00022B010	Longnecker Road	Little Portage Creek	Prestressed Conc	Mult Box Beam	1	2008		Local	Mendon	45	2014	11/07/2025	A		7	NA	7	8	6	NA	7	NA	NA	NA	7 Good	N	N		3	5
Concrete Slab																														
10361	78311A00002B010	Findley Road	Prairie River	Concrete Continuous	Slab	2	1971		Local	Nottawa	682	2011	11/06/2025	A		7	7	7	7	6	NA	7	NA	NA	NA	7 Good	N	N		NA	5
Concrete Culvert																														
10311	78200047000B010	Klinger Lake Road	Sherman Mill Creek	Concrete	Culvert		2021		Primary (FAS)	White Pigeon	789	2013	11/13/2025	A						8	8				8 Good	N	N		NA	8
Timber Slab																														
10289	78200003000B020	Fawn River Road	Fawn River	Wood or Timber	Slab	2	1964		Primary (FAS)	Fawn River	1441	2016	11/24/2025	P	23 / 31 / 57	5	5	6	4	7	NA	5	NA	NA	NA	4 Poor	Y	N		NA	5
10292	78200013000B010	Middle Colon Road	Prairie River	Wood or Timber	Slab	2	1963		Primary	Burr Oak	720	2022	11/17/2025	A		6	6	6	5	6	NA	5	NA	NA	NA	5 Fair	N	N		NA	5
10294	78200025000B010	Dean Street	Prairie River	Wood or Timber	Slab	2	1967		Primary	Nottawa	1314	2017	11/06/2025	P	32 / 56 / 70	5	5	5	5	4	NA	6	NA	NA	NA	5 Fair	N	N		NA	5
10301	78200032000B030	Correll Road	Nottawa Creek	Wood or Timber	Slab	3	1967		Primary (FAS)	Leonidas	577	2016	11/14/2025	A		6	6	6	5	7	NA	7	NA	NA	NA	5 Fair	N	N		NA	5
10303	78200038000B010	Bent Road	Rocky River	Wood or Timber	Slab	3	1981		Primary (FAS)	Flowerfield	472	2018	11/04/2025	A		6	6	6	5	6	NA	6	NA	NA	NA	5 Fair	N	N		NA	5
10308	78200045000B010	Block Road	Sherman Mill Creek	Wood or Timber	Slab	1	1964		Primary	White Pigeon	65	2018	11/21/2025	A		6	6	6	6	6	NA	5	NA	NA	NA	6 Fair	N	N		NA	5
10309	78200045000B020	Stroble Road	Prairie River	Wood or Timber	Slab	3	1967		Primary (FAS)	Lockport	407	2021	11/04/2025	P	31 / 52 / 67	5	5	5	5	6	NA	6	NA	NA	NA	5 Fair	N	N		NA	5
10317	78200051000B020	Nottawa Road	Spring Creek	Wood or Timber	Slab	1	1987		Primary (FAS)	Nottawa	1419	2017	11/06/2025	A		7	7	7	6	4	NA	6	NA	NA	NA	6 Fair	N	N		NA	5
10318	78200052000B010	Nottawa Road	Wood Lake Drain	Wood or Timber	Slab	2	1966		Primary	Mendon	1455	2019	11/07/2025	P	31 / 51 / 67	5	5	5	4	6	NA	6	NA	NA	NA	4 Poor	Y	N		NA	5
10321	78200058000B020	North Burr Oak Road	Little Swan Creek	Wood or Timber	Slab	1	1963		Primary (FAS)	Colon	824	2022	11/04/2025	P	33 / 54 / 71	6	6	6	4	5	NA	7	NA	NA	NA	4 Poor	Y	N		NA	5
10324	78200060000B020	Farrand Road	St Joseph River	Wood or Timber	Slab	13	1965		Primary (FAS)	Colon	1482	2022	11/24/2025	P	30 / 59 / 65	5	5	5	4	6	NA	4	NA	NA	NA	4 Poor	Y	N		NA	5
10326	78200062000B010	Heimbach Road	Portage River	Wood or Timber	Slab	3	1969		Primary	Park	1725	2018	11/06/2025	A		5	5	6	5	6	NA	6	NA	NA	NA	5 Fair	N	N		NA	5
10328	78301B00016B010	Blue School Road	White Pigeon River	Wood or Timber	Slab	4	1978		Local	Mottville	502	2021	11/21/2025	P	30 / 50 / 65	4	5	4	6	5	NA	6	NA	NA	NA	4 Poor	Y	N		NA	5
10329	78302A00025B010	Dickinson Road	Fawn River	Wood or Timber	Slab	4	1987		Local	White Pigeon	282	2021	11/13/2025	P	42 / 64 / 82	6	6	6	6	5	NA	5	NA	NA	NA	6 Fair	N	N		NA	5
10331	78303H00009B010	Stubey Road	Fawn River	Wood or Timber	Slab	2	2001		Local	Sturgis	284	2011	11/21/2025	A		7	7	7	6	7	NA	7	NA	NA	NA	6 Fair	N	N		NA	5
10336	78304H00021B010	Carls Road	Fawn River	Wood or Timber	Slab	2	1964		Local	Fawn River	593	2010	11/24/2025	P	42 / 58 / 76	6	6	6	5	6	NA	6	NA	NA	NA	5 Fair	N	N		NA	5
10337	78304H00026B010	Watt Road	Fawn River	Wood or Timber	Slab	2	2004		Local	Fawn River	44	2003	11/24/2025	A		7	7	8	8	6	NA	5	NA	NA	NA	7 Good	N	N		NA	5
10338	78304H00030B010	Halsey Square Road	Fawn River	Wood or Timber	Slab	1	2001		Local	Fawn River	34	2011	11/24/2025	A		7	7	7	7	6	NA	5	NA	NA	NA	7 Good	N	N		NA	5
10339	78305H00005B010	Quaker Road	Mill Creek	Wood or Timber	Slab	1	1969		Local	Constantine	230	2021	11/13/2025	P	32 / 54 / 70	5	5	5	5	6	NA	5	NA	NA	NA	5 Fair	N	N		NA	5
10341	78305H00034B010	Constantine Street	Fawn River	Wood or Timber	Slab	3	1965		Local	Florence	1370	2022	11/21/2025	A		6	6	6	5	6	NA	6	NA	NA	NA	5 Fair	N	N		NA	5
10343	78306H00005B010	Mintdale Road	Ditch	Wood or Timber	Slab	1	1968		Local	Florence	146	2021	11/21/2025	P	32 / 52 / 69	5	5	6	5	5	NA	5	NA	NA	NA	5 Fair	N	N		NA	5
10344	78306H00022B010	Sevison Road	Fawn River	Wood or Timber	Slab	4	1983		Local	Florence	307	2021	11/21/2025	A		6	6	6	6	6	NA	5	NA	NA	NA	6 Fair	N	N		NA	5
10345	78307H00017B010	Findley Road	Prairie River	Wood or Timber	Slab	3	1979		Local	Nottawa	556	2011	11/17/2025	A		4	6	4	5	6	NA	5	NA	NA	NA	4 Poor	Y	N		NA	5
10348	78308H00009B010	Hackman Road	Prairie River	Wood or Timber	Slab	3	1979		Primary	Burr Oak	777	2016	11/17/2025	A		6	6	6	5	6	NA	6	NA	NA	NA	5 Fair	N	N		NA	5
10349	78308H00016B010	Townline Road	Big Swan Creek	Wood or Timber	Slab	2	1982		Local	Colon	118	2011	11/04/2025	A		6	6	6	6	5	NA	6	NA	NA	NA	6 Fair	N	N		NA	5
10350	78308H00020B010	Prairie River Road	Prairie River	Wood or Timber	Slab	2	1967		Local	Burr Oak	160	2010	11/17/2025	P	42 / 55 / 73	5	5	6	4	6	NA	6	NA	NA	NA	4 Poor	Y	N		NA	5
10351	78308H00024B010	McKale Road	Prairie River	Wood or Timber	Slab	2	1965		Local	Burr Oak	87	2003	11/17/2025	A		6	6	6	4	5	NA	6	NA	NA	NA	4 Poor	Y	N		NA	5
10352	78308H00030B010	Needham Road	Prairie River	Wood or Timber	Slab	2	1966		Local	Burr Oak	70	2011	11/17/2025	A		6	6	6	4	6	NA	6	NA	NA	NA	4 Poor	Y	N		NA	5
10353	78308H00031B010	Needham Road	Big Swan Creek	Wood or Timber	Slab	2	2003		Local	Burr Oak	54	2003	11/04/2025	A		7	7	7	6	5	NA	5	NA	NA	NA	6 Fair	N	N		NA	5
10354	78308H00032B010	Middle Colon Road	Big Swan Creek	Wood or Timber	Slab	1	2008		Local	Burr Oak	234	2010	11/04/2025	A		8	7	8	7	6	NA	7	NA	NA	NA	7 Good	N	N		NA	5
10355	78309H00027B010	Null Road	Rocky River	Wood or Timber	Slab	2	1966		Local	Flowerfield	710	2021	11/06/2025	P	42 / 55 / 73	6	6	6	6	7	NA	7	NA	NA	NA	6 Fair	N	N		NA	5
10357	78310H00002B010	Hoshel Road	Prairie River	Wood or Timber	Slab	4	1976		Local	Lockport	142	2021	11/04/2025	A		6	6	6	6	5	NA	6	NA	NA	NA	6 Fair	N	N		NA	5
10358	78310H00019B010	Constantine Street	St Joseph River	Wood or Timber	Slab	12	1972		Local	Lockport	1384	2010	11/12/2024	P	42 / 64 / 82	5	5	5	4	5	NA	4	NA	NA	NA	4 Poor	Y	N		NA	5
10360	78310H00030B010	Carpenter Road	Portage River	Wood or Timber	Slab	4	1985		Local	Lockport	57	2021	11/06/2025	A		6	6	6	6	5	NA	6	NA	NA	NA	6 Fair	N	N		NA	5
10362	78311A00003B010	Findley Road	Prairie River	Wood or Timber	Slab	5	1972		Local	Nottawa	527	2011	11/06/2025	A		5	5	5	4	6	NA	5	NA	NA	NA	4 Poor	Y	N		NA	5
10364	78311A00029B010	Rambadt Road	Prairie River	Wood or Timber	Slab	3	1971		Local	Nottawa	304	2011	11/06/2025	P	31 / 51 / 67	5	5	5	5	6	NA	5	NA	NA	NA	5 Fair	N	N		NA	5
10365	78311A00031B010	Rambadt Road	Spring Creek	Wood or Timber	Slab	2	1999		Local	Nottawa	97	2003	11/06/2025	A		7	7	7	6	6	NA	4	NA	NA	NA	6 Fair	N	N		NA	5

Inventory Data													Inspection Findings													Appraisal					
Struct. Nbr.	Bridge ID	Facility Carried	Features Intersected	Structure Type 43A	Structure Type 43B	Number of Main Spans	Year Built	Year Recon	Primary Local	Township	ADT	Year of ADT	Insp. Date	Operational Status (Item 41)	Load Rating	Deck Rating	Deck Bottom Rating	SuperStr Rating	Substr Rating	Channel Rating	Culvert Rating	Surface Rating	Paint Rating	Exp Joint Rating	Other Joints	Structure Evaluation	Structurally Deficient	Functionally Obsolete	Sufficiency Rating	Section Loss	Scour Critical
Timber Slab																															
10367	78311A00040B010	Bucknell Road	Spring Creek	Wood or Timber	Slab	1	2008		Local	Nottawa	40	2003	11/06/2025	A		8	8	8	6	5	NA	4	NA	NA	NA	6 Fair	N	N		NA	5
10368	78311A00042B010	Filmore Road	Prairie River	Wood or Timber	Slab	3	1970		Local	Nottawa	127	2011	11/17/2025	A		6	6	6	5	6	NA	5	NA	NA	NA	5 Fair	N	N		NA	5
10370	78312H00009B010	Hagelgans Road	Washburn Creek	Wood or Timber	Slab	1	1909	1996	Local	Colon	38	2003	11/04/2025	A		7	8	7	5	5	NA	5	NA	NA	NA	5 Fair	N	N		NA	U
10371	78312H00011B010	Custer Road	Washburn Creek	Wood or Timber	Slab	1	2009		Local	Colon	56	2011	11/04/2025	A		7	8	8	7	4	NA	6	NA	NA	NA	7 Good	N	N		NA	5
10374	78313H00030B010	Delong Road	Rocky River	Wood or Timber	Slab	2	2002		Local	Flowerfield	49	2003	11/04/2025	A		8	8	8	7	6	NA	5	NA	NA	NA	7 Good	N	N		NA	5
10375	78313H00038B010	Flatbush Road	Rocky River	Wood or Timber	Slab	2	1963		Local	Flowerfield	104	2021	11/06/2025	P	31 / 51 / 67	5	5	5	6	5	NA	6	NA	NA	NA	5 Fair	N	N		NA	5
10378	78315H00019B010	Flach Road	Beak Creek	Wood or Timber	Slab	1	1986		Local	Mendon	152	2014	11/07/2025	A		7	7	7	5	6	NA	6	NA	NA	NA	5 Fair	N	N		NA	5
10380	78315H00032B010	Hallam Road	Beak Creek	Wood or Timber	Slab	2	1998		Local	Mendon	159	2010	11/07/2025	A		7	7	7	7	6	NA	6	NA	NA	NA	7 Good	N	N		NA	5
10382	78316H00013B010	Kings Mill Road	Mill Race	Wood or Timber	Slab	1	1906	1981	Local	Leonidas	167	2014	11/14/2025	A		6	6	6	4	6	NA	6	NA	NA	NA	4 Poor	Y	Y		NA	5
10383	78316H00013B020	Kings Mill Road	Nottawa Creek	Wood or Timber	Slab	4	1977		Local	Leonidas	167	2014	11/14/2025	A		6	6	6	5	6	NA	6	NA	NA	NA	5 Fair	N	N		NA	5
10384	78316H00029B010	Olney Road	Nottawa Creek	Wood or Timber	Slab	4	1984		Local	Leonidas	115	2010	11/14/2025	A		7	7	7	6	6	NA	5	NA	NA	NA	6 Fair	N	N		NA	5
10385	78316H00033B010	Lawrence Road	Beak Creek	Wood or Timber	Slab	1	2005		Local	Leonidas	26	2003	11/14/2025	A		7	8	7	8	8	NA	7	NA	NA	NA	7 Good	N	N		NA	5
10386	78316H00040B010	Shorts Road	Nottawa Creek	Wood or Timber	Slab	3	1967		Local	Leonidas	159	2010	11/14/2025	A		5	5	5	5	6	NA	7	NA	NA	NA	5 Fair	N	Y		NA	5
14344	78309H00018N010	Coon Hollow Road	Little Pheasant Lake Outlet	Wood or Timber	Slab	1	2020		Local	Fabius	705	2011	11/29/2023	A		8	8	8	6	5	NA	8	NA	NA	NA	6 Fair	N	N		NA	6
Timber Stringer/Girder																															
10300	78200032000B020	Michigan Avenue	Little Portage Creek	Wood or Timber	Stringer/Girder	1	1968		Primary (FAS)	Mendon	596	2016	11/07/2025	P	42	6	6	6	5	6	NA	6	NA	NA	NA	5 Fair	N	N		2 < 10% LOS	4
10381	78315H00046B010	McClish Road	Portage Creek	Wood or Timber	Stringer/Girder	1	1968		Local	Mendon	59	2003	11/07/2025	P	42	5	5	6	5	6	NA	5	NA	NA	NA	5 Fair	N	N		3	5
Timber Culvert																															
10291	78200006000B010	Crooked Creek Road	Klinger Lake Outlet	Wood or Timber	Culvert	3	1963		Primary (FAS)	White Pigeon	709	2019	11/13/2025	A		NA	NA	NA	NA	6	6	NA	NA	NA	NA	6 Fair	N	N		NA	8
Timber Truss																															
10314	78200050000B020	Covered Bridge Road	St Joseph River	Wood or Timber	Truss-Thru	3	1885	2008	Primary	Lockport	1144	2018	11/24/2025	P	3	7	7	7	6	6	NA	8	NA	NA	7	6 Fair	4	N		1 > 10% LOS	5
Steel Stringer/Girder																															
10288	78200003000B010	Fawn River Road	Fawn River	Steel	Stringer/Girder	1	1954		Primary (FAS)	White Pigeon	1594	2012	11/13/2025	A		6	6	5	5	6	NA	7	5	NA	5	5 Fair	N	Y		2 < 10% LOS	5
10296	78200027000B010	Wattles Road	McArty Drain	Steel	Stringer/Girder	1	1950		Primary (FAS)	Colon	1496	2016	11/04/2025	A		6	6	6	7	5	NA	8	6	NA	NA	6 Fair	N	N		1>10% LOS	5
10369	7811A0043B010	Waterspaugh Rd	Spring Creek	Steel	Stringer/Girder	1	1950		Local	Mendon	50	2017	11/06/2025	P	6	5	6	3	3	6	NA	5	3	NA	NA	3 Serious	Y	Y		0	U
Steel Culvert																															
14529	78316H00016C010	Lawrence Road	Bear Creek	Streel	Culvert	4	1969		Local	Leonidas	26	2003	11/14/2025	A		NA	NA	NA	NA	5	5	NA	NA	NA	NA	5 Fair	N	N		NA	6
14530	78316H00019C010	Longnecker Road	Bear Creek	Streel	Culvert	4	1969		Local	Leonidas	57	2003	11/07/2025	A		NA	NA	NA	NA	6	3	NA	NA	NA	NA	3 Serious	Y	N		NA	7
14531	78200060000C010	Fulton Road	Bear Creek	Streel	Culvert	3	1969		Primary	Leonidas	1113	2019	11/07/2025	A		NA	NA	NA	NA	5	5	NA	NA	NA	NA	5 Fair	N	N		NA	6
14532	78200040000C010	Pulver Road	Bear Creek	Streel	Culvert	3	1969		Primary	Flowerfield	336	2009	11/04/2025	A		NA	NA	NA	NA	6	5	NA	NA	NA	NA	5 Fair	N	N		NA	5
Steel Tub Girder																															
10316	78200051000B010	Nottawa Road	Prairie River	Steel	Mult Box Beam	2	1963		Primary (FAS)	Nottawa	1212	2019	11/17/2025	A		8	8	8	6	6	NA	8	NA	7	NA	6 Fair	N	N		3	5
10377	78315H00004B010	Prairie Corner Road	St Joseph River	Steel	Mult Box Beam	3	2026		Local	Mendon	599	2010																			
Aluminum Culvert																															
14592	78200048000C010	Shimmel Road	Sherman Mill Creek	Aluminum	Culvert	1	2022		Primary	Sherman	2225	2022	11/21/2025	A		NA	NA	NA	NA	7	8	NA	NA	NA	NA	8 Good	N	N		NA	6

Appendix 4

Inventory Data													Replacement			Rehabilitation							Preventative Maintenance					Scheduled Maintenance										
Struct. Nbr.	Bridge ID	Facility Carried	Features Intersected	Structure Type 43A	Structure Type 43B	Number of Main Spans	ADT	Posted	Load Rating	Total Str Length	Total Str Width	Total Str Area	Total	Super-Structure	Deck	HMA Overlay w/ Membrane	Mill and Repave Deck	Replace / Retrofit Railing	Steel Beam Repairs	P/S Conc. Beam Repairs	Substructure Timber Repair	Patch Substr Conc	Joint Repair Replace	Seal Deck	Complete Painting	Zone Painting	Deck Patching	Vegatation Control	Debris Removal	Fix Drainage	Spot Painting	Seal Cracks / Joints	Joint Cleaning	Repair or Replace Guardrail	Repave Approaches	Repair Slopes / Erosion	Detailed Inspection	Signs and Markers	Install Riprap
Concrete I Beams																																						
10335	78304H00019B010	Kime Road	Fawn River	Prestressed Conc	Stringer/Girder	1	334			80	34.71	2776.8																		M		M							
10356	78309H00056B010	Cowling Road	Rocky River	Prestressed Conc	Stringer/Girder	3	127			117	38.39	4491.63																M					H	M					
13850	78200005000B020	North River Road	Mill Creek	Prestressed Conc	Stringer/Girder	1	822			70	38.9	2723															L	L	M	M		M	M			L				
Concrete Box Beams																																						
10290	78200005000B010	North River Road	Black Run River	Prestressed Conc	Mult Box Beam	1	1075			42	33.6	1411.2								M					Silane M			M	L	M					M				
10293	78200024000B010	S Fisher Lake Road	Portage River	Prestressed Conc	Sinlge / Spread	2	862			120	32.9	3948												M											M				
10295	78200025000B020	Nottawa Road	St Joseph River	Prestressed Conc	Mult Box Beam	3	1915			165	33.14	5468.1																M	M				L						
10297	78200028000B010	Floating Bridge Road	Rocky River	Prestressed Conc	Mult Box Beam	1	225			90	34.9	3141												L								L							
10298	78200030000B010	Flowerfield Road	Flowerfield Creek	Prestressed Conc	Mult Box Beam	1	423			56	31.1	1741.6																		L		L							
10299	78200032000B010	Michigan Avenue	Portage River	Prestressed Conc	Mult Box Beam	2	863			68	30.18	2052.24						H		H			M										H						
10302	78200033000B010	Vistula Road	White Pigeon River	Prestressed Conc	Mult Box Beam	2	439			131	37.4	4899.4						L						M				M				M	M					H
10304	78200040000B010	Pulver Road	Rocky River	Prestressed Conc	Mult Box Beam	1	516			72	34.9	2512.8												M					L			L						
10305	78200042000B010	Kalamazoo Street	White Pigeon River	Prestressed Conc	Mult Box Beam	2	1560			120	41.2	4944																	M		L	M	M					
10306	78200044000B010	Lutz Road	Fawn River	Prestressed Conc	Mult Box Beam	2	2319			90	33.79	3041.1									L											M		H	M		M		L
10307	78200044000B020	Lutz Road	Prairie River	Prestressed Conc	Mult Box Beam	2	2938	Posted	42 / 64 / 77	114.5	38.81	4443.745														M		M	M	M			M						
10310	78200045000B030	Schweitzer Road	St Joseph River	Prestressed Conc	Mult Box Beam	4	1060	Posted	42 / 55 / 64	252	30.18	7605.36																				M	M				H	H
10312	78200049000B010	Parkville Road	Portage River	Prestressed Conc	Mult Box Beam	2	983			80	33.14	2651.2						H		H			H					L				H				H		
10313	78200050000B010	Silver Street	Portage River	Prestressed Conc	Mult Box Beam	1	3570			85	40.9	3476.5																							L				
10315	78200050000B030	Clark Street	Prairie River	Prestressed Conc	Mult Box Beam	2	NA			72	33.46	2409.12						L											L			M						M
10319	78200055000B010	Fawn River Road	Fawn River	Prestressed Conc	Mult Box Beam	1	615	Posted	42 / 58 / 67	64	37.4	2393.6								H			H			H		M										H
10320	78200058000B010	North Burr Oak Road	Big Swan Creek	Prestressed Conc	Mult Box Beam	1	588			52	30.51	1586.52						M											L			L			L			
10322	78200059000B010	Bennett	St Joseph River	Prestressed Conc	Mult Box Beam	3	570	Posted	42 / 54 / 64	174	30.18	5251.32						M		M		M	M	M				M	L				M					M
10323	78200060000B010	Fulton Road	Nottawa Creek	Prestressed Conc	Mult Box Beam	2	756			80	33.46	2676.8				M				H			L															
10325	78200061000B010	Stowell Road	St Joseph River	Prestressed Conc	Mult Box Beam	3	485			146.75	33.6	4930.8														M		M	L	L		M	L		L			
10327	78301B00012B010	Thomas Street	White Pigeon River	Prestressed Conc	Mult Box Beam	2	416			118	33.6	3964.8														M		M	M			M	M	M	M			
10330	78302A00026B010	Sevison Road	White Pigeon River	Prestressed Conc	Mult Box Beam	2	563			116	30.84	3577.44											H					M	H	M			M	M				H
10332	78303H00021B010	Balk Road	Fawn River	Prestressed Conc	Mult Box Beam	2	51			90.5	33.6	3040.8														M		L	M				M					
10333	78304H00001B010	Miller Road	Fawn River	Prestressed Conc	Mult Box Beam	1	326			95	32.9	3125.5																		L								M
10334	78304H00014B010	Big Hill Road	Fawn River	Prestressed Conc	Mult Box Beam	1	89			84	31.2	2620.8														M				L				L				H
10340	78305H00017B010	Withers Road	St Joseph River	Prestressed Conc	Mult Box Beam	4	830			242	30.18	7303.56											M			M							M					
10359	78310H00026B010	Nearman Road	Prairie River	Prestressed Conc	Mult Box Beam	2	115			125	31.4	3925					H			M			M			M		M	M			H					
10363	78311A00005B010	Truckenmiller Road	Prairie River	Prestressed Conc	Mult Box Beam	2	232			75	33.3	2497.5																L	M	L			L					L
10366	78311A00034B010	Angevine Road	St Joseph River	Prestressed Conc	Mult Box Beam	3	713			225	33.14	7456.5								M		M										M	M	L				
10372	78312H00014B010	Decker Road	Lake Channel	Prestressed Conc	Mult Box Beam	1	542			65	32.9	2138.5												L				M		M								L
10373	78312H00015B010	Decker Road	Washburn Creek	Prestressed Conc	Mult Box Beam	3	297			45	28.9	1300.5												L						L		M						
10376	78314H00032B010	N Fisher Lake Road	Portage River	Prestressed Conc	Mult Box Beam	4	230			200	30.84	6168														M						H	M					
10379	78315H00022B010	Longnecker Road	Little Portage Creek	Prestressed Conc	Mult Box Beam	1	45			56	33.6	1881.6														L						L		M				
Concrete Slab																																						
10361	78311A00002B010	Findley Road	Prairie River	Concrete Continuous	Slab	2	682			40	32.81	1312.4						H																M				M
Concrete Culvert																																						
10311	78200047000B010	Klinger Lake Road	Sherman Mill Creek	Concrete	Culvert	1	789			25	30.1	752.5																											
Timber Slab																																						
10289	78200003000B020	Fawn River Road	Fawn River	Wood or Timber	Slab	2	1593	Posted	23 / 31 / 57	52	31.5	1638	Replace 2027					M																	H			
10292	78200013000B010	Middle Colon Road	Prairie River	Wood or Timber	Slab	2	793			44	27.23	1198.12						L			M			L					L	L			L					
10294	78200025000B010	Dean Street	Prairie River	Wood or Timber	Slab	2	950	Posted	32 / 56 / 70	44	31.82	1400.08						L			H									L								H
10301	78200032000B030	Correll Road	Nottawa Creek	Wood or Timber	Slab	3	545			78	32.15	2507.7						H		M												M		M		L		
10303	78200038000B010	Bent Road	Rocky River	Wood or Timber	Slab	3	495			38	31.17	1184.46						H		L												H						
10308	78200045000B010	Block Road	Sherman Mill Creek	Wood or Timber	Slab	1	57			28	26.21	733.88									M									L		M						M
10309	78200045000B020	Stroble Road	Prairie River	Wood or Timber	Slab	3	350		31 / 52 / 67	72	31.5	2268						H														M						H
10317	78200051000B020	Nottawa Road	Spring Creek	Wood or Timber	Slab	1	1160			28	33.79	946.12						L										H	M	L		M		M	M			
10318	78200052000B010	Nottawa Road	Wood Lake Drain	Wood or Timber	Slab	2	1401	Posted	31 / 51 / 67	50	31.17	1558.5	M					M			H									M								L
10321	78200058000B020	North Burr Oak Road	Little Swan Creek	Wood or Timber	Slab	1	763	Posted	33 / 54 / 71	26	29.49	766.74	M					L			M				L					L								
10324	78200060000B020	Farrand Road	St Joseph River	Wood or Timber	Slab	13	1576	Posted	30 / 59 / 65	312	31.5	9828	Replace 2026																L									
10326	78200062000B010	Heimbach Road	Portage River	Wood or Timber	Slab	3	943			72	33.01	2376.72																				M			L			
10328	78301B00016B010	Blue School Road	White Pigeon River	Wood or Timber	Slab	4	191	Posted	30 / 50 / 65	96	32.15	3086.4	M					M			M								M			M			M			
10329	78302A00025B010	Dickinson Road	Fawn River	Wood or Timber	Slab	4	319	Posted	42 / 64 / 82	96	33.79	3243.84					M	M											H			M						
10331	78303H00009B010	Stubey Road	Fawn River	Wood or Timber	Slab	2	284			48	33.46	1606.08						M			H											M						M
10336	78304H00021B010	Carls Road	Fawn River	Wood or Timber	Slab	2	593	Posted	42 / 58 / 76	52	25.59	1330.68	Replace 2028					M			M															H		M
10337	78304H00026B010	Watt Road	Fawn River	Wood or Timber	Slab	2	44			52	29.3	1523.6						M			L									M		M						
10338	78304H00030B010	Halsey Square Road	Fawn River	Wood or Timber	Slab	1	34			52	31.82	1654.64					M	M			M								M			M						
10339	78305H00005B010	Quaker Road	Mill Creek	Wood or Timber	Slab	1	280	Poasted	32 / 54 / 70	24	31.17	748.08	M				M	H			M																	M
10341	78305H00034B010	Constantine Street	Fawn River	Wood or Timber	Slab	3	1880			66	26.21	1729.86	L					H			M														L	M		
10343	78306H00005B010	Mintdale Road	Ditch	Wood or Timber	Slab	1	244	Posted	32 / 52 / 69	26	27.89	725.14					M	M			M									M					M	H			
10344	78306H00022B010	Sevison Road	Fawn River	Wood or Timber	Slab	4	350			88	31.17	2742.96						M											L	L		M			M			L
10345	78307H00017B010	Findley Road	Prairie River	Wood or Timber	Slab	3	556			66	31.62	2086.92					M	M			H							M	L						M	M	H		
10348	78308H00009B010	Hackman Road	Prairie River	Wood or Timber	Slab	3	793			66	33.01	2178.66						M										L	L									
10349	78308H00016B010	Townline Road	Big Swan Creek	Wood or Timber	Slab	2	118			48	31.17	1496.16						L		L									L	L		M						
10350	78308H00020B010	Prairie River Road	Prairie River	Wood or Timber	Slab	2	160	Posted	42 / 55 / 73	52	31.82	1654.64						M			M									L		M			L			M
10351	78308H00024B010	McKale Road	Prairie River	Wood or Timber	Slab	2	87			44	26.21	1153.24						L			M									L								
10352	78308H00030B010	Needham Road	Prairie River	Wood or Timber	Slab	2	70			44	28.22	1241.68						M			M																	
10353	78308H00031B010	Needham Road	Big Swan Creek	Wood or Timber	Slab	2	54			64	29.49	1887.36					L	L			M								M	L				M				H
10354	78308H00032B010	Middle Colon Road	Big Swan Creek	Wood or Timber	Slab	1	234			28	29.69	831.32						M			M							L		L		M						
10355	78309H00027B010	Null Road	Rocky River	Wood or Timber	Slab	2	418	Posted	42 / 55 / 73	52	30.51	1586.52						H			H											H		H	H			
10357	78310H00002B010	Hoshel Road	Prairie River	Wood or Timber	Slab	4	182			80	32.15	2572						M										M	M			M						
10358	78310H00019B010	Constantine Street	St Joseph River	Wood or Timber	Slab	12	1384	Posted	42 / 64 / 82	240	31.82	7636.8	H				M	M			M											M		M	L			
10360	78310H00030B010	Carpenter Road	Portage River	Wood or Timber	Slab	4	66			88	31.17	2742.96						H												L		H						
10362	78311A00003B010	Findley Road	Prairie River	Wood or Timber	Slab	5	527			100	31.82	3182						M			M			M				M							M	2026			
10364	78311A00029B010	Rambadt Road	Prairie River	Wood or Timber	Slab	3	304	Posted	31 / 51 / 67	78	31.82	2481.96					M	L			H													H				
10365	78311A00031B010	Rambadt Road	Spring Creek	Wood or Timber	Slab	2	97			32	31.5	1008					M				M													M				
10367	78311A00040B010	Bucknell Road	Spring Creek	Wood or Timber	Slab	1	40			28	29.49	825.72					M				M							M	M					M				M
10368	78311A00042B010	Filmore Road	Prairie River	Wood or Timber	Slab	3	127			66	31.82	2100.12						M			M								L	L		M			L		M	

Inventory Data													Replacement			Rehabilitation						Preventative Maintenance					Scheduled Maintenance										
Struct. Nbr.	Bridge ID	Facility Carried	Features Intersected	Structure Type 43A	Structure Type 43B	Number of Main Spans	ADT	Posted	Load Rating	Total Str Length	Total Str Width	Total Str Area	Total	Super-Structure	Deck	HMA Overlay w/ Membrane	Mill and Repave Deck	Replace / Retrofit Railing	Steel Beam Repairs	P/S Conc. Beam Repairs	Substructure Timber Repair	Patch Substr Conc	Joint Repair Replace	Seal Deck	Complete Painting	Zone Painting	Deck Patching	Vegatation Control	Debris Removal	Fix Drainage	Spot Painting	Seal Cracks / Joints	Joint Cleaning	Repair or Replace Guardrail	Repave Approaches	Repair Slopes / Erosion	Detailed Inspection	Signs and Markers	Install Riprap
Timber Slab																																						
10370	78312H00009B010	Hagelgans Road	Washburn Creek	Wood or Timber	Slab	1	38			30	22.51	675.3					M	L				L							L	L					M			L
10371	78312H00011B010	Custer Road	Washburn Creek	Wood or Timber	Slab	1	56			28	29	812					M				M								M			M			M			L
10374	78313H00030B010	Delong Road	Rocky River	Wood or Timber	Slab	2	49			32	31.2	998.4						H														H					H	
10375	78313H00038B010	Flatbush Road	Rocky River	Wood or Timber	Slab	2	126	Posted	31 / 51 / 67	52	26.25	1365									H											H						
10378	78315H00019B010	Flach Road	Beak Creek	Wood or Timber	Slab	1	152			28	31.17	872.76						H														M			M			H
10380	78315H00032B010	Hallam Road	Beak Creek	Wood or Timber	Slab	2	100			32	31.82	1018.24						H											L			H						
10382	78316H00013B010	Kings Mill Road	Mill Race	Wood or Timber	Slab	1	167			24	20.01	480.24						M				H														H		
10383	78316H00013B020	Kings Mill Road	Nottawa Creek	Wood or Timber	Slab	4	167			88	31.17	2742.96						M														H		H	H			
10384	78316H00029B010	Olney Road	Nottawa Creek	Wood or Timber	Slab	4	115			88	31.17	2742.96					M	M			M																	
10385	78316H00033B010	Lawrence Road	Beak Creek	Wood or Timber	Slab	1	26			27	29.49	796.23						M														L		L				
10386	78316H00040B010	Shorts Road	Nottawa Creek	Wood or Timber	Slab	3	159			66	31.18	2057.88						M														L		L				
14344	78309H00018N010	Coon Hollow	Little Pheasant Lake Outlet	Steel	Stringer/Girder	1				18	24	432											L											H				H
Timber Stringer/Girder																																						
10300	78200032000B020	Michigan Avenue	Little Portage Creek	Wood or Timber	Stringer/Girder	1	456	Posted	42	32	31.82	1018.24	M																			M						
10381	78315H00046B010	McClish Road	Portage Creek	Wood or Timber	Stringer/Girder	1	NA	Posted	42	32	31.5	1008	M					H														H						
Timber Culvert																																						
10291	78200006000B010	Crooked Creek Road	Klinger Lake Outlet	Wood or Timber	Culvert	3	579			21	37.73	792.33						M																				M
Timber Truss																																						
10314	78200050000B020	Covered Bridge Road	St Joseph River	Wood or Timber	Truss-Thru	3	2099	Posted	3	280	16.08	4502.4							H																L			
Steel Stringer/Girder																																						
10288	78200003000B010	Fawn River Road	Fawn River	Steel	Stringer/Girder	1	1594			80	29.2	2336						H	H			M	H		H				M			M						M
10296	78200027000B010	Wattles Road	McArty Drain	Steel	Stringer/Girder	1	1362			30	31.82	954.6																L	H									
10369	7811A0043B010	Waterspaugh Rd	Spring Creek	Steel	Stringer/Girder	1	50	Posted	6	19.5	20.3	395.85	H				H	H										M	M							H	H	
Steel Culvert																																						
14529	78316H00016C010	Lawrence Road	Bear Creek	Streel	Culvert	4	26			25.2			M																										
14530	78316H00019C010	Longnecker Road	Bear Creek	Streel	Culvert	4	57			26.4			H																H									
14531	78200060000C010	Fulton Road	Bear Creek	Streel	Culvert	3	1113			24																		H									
14532	78200040000C010	Pulver Road	Bear Creek	Streel	Culvert	3	336			20.8																		H					H		M		
Steel Tub Girder																																						
10316	78200051000B010	Nottawa Road	Prairie River	Steel	Box Beam Spread	2	1177			60	33.46	2007.6																		M			M					
10377	78315H00004B010	Prairie Corner Road	St Joseph River	Steel	Box Beam Spread	6	NA (532)			179	33	5907																										
Aluminum Culvert																																						
14592	78200048000C010	Shimmel Road	Sherman Mill Creek	Aluminum	Culvert	1	2225			21.9	99	2168.1																	M									

Appendix 5

Inventory Data													Inspection Items							
Struct. Nbr.	Bridge ID	Facility Carried	Features Intersected	Structure Type 43A	Structure Type 43B	Number of Main Spans	ADT	Posted	Load Rating	Total Str Length	Total Str Width	Total Str Area	Initial Inspection	In Depth Steel Inspection	Pin and Hanger Inspection	Diving Inspection	Provide Monitoring	Review Scour Criticality	Load Rating	Update SIA
Concrete I Beams																				
10335	78304H00019B010	Kime Road	Fawn River	Prestressed Conc	Stringer/Girder	1	334			80	34.71	2776.8	x							
10356	78309H00056B010	Cowling Road	Rocky River	Prestressed Conc	Stringer/Girder	3	127			117	38.39	4491.63	x							
13850	78200005000B020	North River Road	Mill Creek	Prestressed Conc	Stringer/Girder	1	822			70	38.9	2723	x							
Concrete Box Beams																				
10290	78200005000B010	North River Road	Black Run River	Prestressed Conc	Mult Box Beam	1	1075			42	33.6	1411.2	x							
10293	78200024000B010	S Fisher Lake Road	Portage River	Prestressed Conc	Sinlge / Spread	2	862			120	32.9	3948	x							
10295	78200025000B020	Nottawa Road	St Joseph River	Prestressed Conc	Mult Box Beam	3	1915			165	33.14	5468.1	x			x				
10297	78200028000B010	Floating Bridge Road	Rocky River	Prestressed Conc	Mult Box Beam	1	225			90	34.9	3141	x							
10298	78200030000B010	Flowerfield Road	Flowerfield Creek	Prestressed Conc	Mult Box Beam	1	423			56	31.1	1741.6	x							
10299	78200032000B010	Michigan Avenue	Portage River	Prestressed Conc	Mult Box Beam	2	863			68	30.18	2052.24	x							
10302	78200033000B010	Vistula Road	White Pigeon River	Prestressed Conc	Mult Box Beam	2	439			131	37.4	4899.4	x							
10304	78200040000B010	Pulver Road	Rocky River	Prestressed Conc	Mult Box Beam	1	516			72	34.9	2512.8	x							
10305	78200042000B010	Kalamazoo Street	White Pigeon River	Prestressed Conc	Mult Box Beam	2	1560			120	41.2	4944	x							
10306	78200044000B010	Lutz Road	Fawn River	Prestressed Conc	Mult Box Beam	2	2319			90	33.79	3041.1	x							
10307	78200044000B020	Lutz Road	Prairie River	Prestressed Conc	Mult Box Beam	2	2938			114.5	38.81	4443.745	x							
10310	78200045000B030	Schweitzer Road	St Joseph River	Prestressed Conc	Mult Box Beam	4	1060	Posted	42 / 55 / 64	252	30.18	7605.36	x			x				
10312	78200049000B010	Parkville Road	Portage River	Prestressed Conc	Mult Box Beam	2	983			80	33.14	2651.2	x							
10313	78200050000B010	Silver Street	Portage River	Prestressed Conc	Mult Box Beam	1	3570			85	40.9	3476.5	x							
10315	78200050000B030	Clark Street	Prairie River	Prestressed Conc	Mult Box Beam	2	NA			72	33.46	2409.12	x							
10319	78200055000B010	Fawn River Road	Fawn River	Prestressed Conc	Mult Box Beam	1	615	Posted	42 / 58 / 67	64	37.4	2393.6	x							
10320	78200058000B010	North Burr Oak Road	Big Swan Creek	Prestressed Conc	Mult Box Beam	1	588			52	30.51	1586.52	x							
10322	78200059000B010	Bennett	St Joseph River	Prestressed Conc	Mult Box Beam	3	570	Posted	42 / 54 / 64	174	30.18	5251.32	x							
10323	78200060000B010	Fulton Road	Nottawa Creek	Prestressed Conc	Mult Box Beam	2	756			80	33.46	2676.8	x							
10325	78200061000B010	Stowell Road	St Joseph River	Prestressed Conc	Mult Box Beam	3	485			146.75	33.6	4930.8	x			x				
10327	78301B00012B010	Thomas Street	White Pigeon River	Prestressed Conc	Mult Box Beam	2	416			118	33.6	3964.8	x							
10330	78302A00026B010	Sevison Road	White Pigeon River	Prestressed Conc	Mult Box Beam	2	563			116	30.84	3577.44	x							
10332	78303H00021B010	Balk Road	Fawn River	Prestressed Conc	Mult Box Beam	2	51			90.5	33.6	3040.8	x							
10333	78304H00001B010	Miller Road	Fawn River	Prestressed Conc	Mult Box Beam	1	326			95	32.9	3125.5	x							
10334	78304H00014B010	Big Hill Road	Fawn River	Prestressed Conc	Mult Box Beam	1	89			84	31.2	2620.8	x							
10340	78305H00017B010	Withers Road	St Joseph River	Prestressed Conc	Mult Box Beam	4	830			242	30.18	7303.56	x			x				
10359	78310H00026B010	Neaman Road	Prairie River	Prestressed Conc	Mult Box Beam	2	115			125	31.4	3925	x							
10363	78311A00005B010	Truckenmiller Road	Prairie River	Prestressed Conc	Mult Box Beam	2	232			75	33.3	2497.5	x							
10366	78311A00034B010	Angevine Road	St Joseph River	Prestressed Conc	Mult Box Beam	3	713			225	33.14	7456.5	x			x				
10372	78312H00014B010	Decker Road	Lake Channel	Prestressed Conc	Mult Box Beam	1	542			65	32.9	2138.5	x							
10373	78312H00015B010	Decker Road	Washburn Creek	Prestressed Conc	Mult Box Beam	3	297			45	28.9	1300.5	x							
10376	78314H00032B010	N Fisher Lake Road	Portage River	Prestressed Conc	Mult Box Beam	4	230			200	30.84	6168	x							
10379	78315H00022B010	Longnecker Road	Little Portage Creek	Prestressed Conc	Mult Box Beam	1	45			56	33.6	1881.6	x							
Concrete Slab																				
10361	78311A00002B010	Findley Road	Prairie River	Concrete Continuous	Slab	2	682			40	32.81	1312.4	x							
Concrete Culvert																				
10311	78200047000B010	Klinger Lake Road	Sherman Mill Creek	Concrete	Culvert	1	789			25	30.1	752.5	x							
Timber Slab																				
10289	78200003000B020	Fawn River Road	Fawn River	Wood or Timber	Slab	2	1593	Posted	31 / 51 / 67	52	31.5	1638	x							
10292	78200013000B010	Middle Colon Road	Prairie River	Wood or Timber	Slab	2	793			44	27.23	1198.12	x							
10294	78200025000B010	North Angling Road	Prairie River	Wood or Timber	Slab	2	950	Posted	32 / 56 / 70	44	31.82	1400.08	x							
10301	78200032000B030	Correll Road	Nottawa Creek	Wood or Timber	Slab	3	545			78	32.15	2507.7								
10303	78200038000B010	Bent Road	Rocky River	Wood or Timber	Slab	3	495			38	31.17	1184.46	x							
10308	78200045000B010	Block Road	Sherman Mill Creek	Wood or Timber	Slab	1	57			28	26.21	733.88	x							
10309	78200045000B020	Stroble Road	Prairie River	Wood or Timber	Slab	3	350			72	31.5	2268	x							
10317	78200051000B020	Nottawa Road	Spring Creek	Wood or Timber	Slab	1	1160			28	33.79	946.12	x							
10318	78200052000B010	Nottawa Road	Wood Lake Drain	Wood or Timber	Slab	2	1401	Posted	33 / 55 / 71	50	31.17	1558.5	x							
10321	78200058000B020	North Burr Oak Road	Little Swan Creek	Wood or Timber	Slab	1	763	Posted	33 / 54 / 71	26	29.49	766.74	x							
10324	78200060000B020	Farrand Road	St Joseph River	Wood or Timber	Slab	13	1576	Posted	30 / 59 / 65	312	31.5	9828	x							
10326	78200062000B010	Heimbach Road	Portage River	Wood or Timber	Slab	3	943			72	33.01	2376.72	x							
10328	78301B00016B010	Blue School Road	White Pigeon River	Wood or Timber	Slab	4	191	Posted	30 / 50 / 65	96	32.15	3086.4	x							
10329	78302A00025B010	Dickinson Road	Fawn River	Wood or Timber	Slab	4	319	Posted	42 / 64 / 82	96	33.79	3243.84	x							
10331	78303H00009B010	Stubey Road	Fawn River	Wood or Timber	Slab	2	284			48	33.46	1606.08	x							
10336	78304H00021B010	Carls Road	Fawn River	Wood or Timber	Slab	2	593	Posted	42 / 58 / 76	52	25.59	1330.68	x							
10337	78304H00026B010	Watt Road	Fawn River	Wood or Timber	Slab	2	44			52	29.3	1523.6	x							
10338	78304H00030B010	Halsey Square Road	Fawn River	Wood or Timber	Slab	1	34			52	31.82	1654.64	x							
10339	78305H00005B010	Quaker Road	Mill Creek	Wood or Timber	Slab	1	280	Poasted	32 / 54 / 70	24	31.17	748.08	x							
10341	78305H00034B010	Constantine Street	Fawn River	Wood or Timber	Slab	3	1880			66	26.21	1729.86	x							
10343	78306H00005B010	Mintdale Road	Ditch	Wood or Timber	Slab	1	244	Posted	32 / 52 / 69	26	27.89	725.14	x							
10344	78306H00022B010	Sevison Road	Fawn River	Wood or Timber	Slab	4	350			88	31.17	2742.96	x							
10345	78307H00017B010	Findley Road	Prairie River	Wood or Timber	Slab	3	556			66	31.62	2086.92	x							
10348	78308H00009B010	Hackman Road	Prairie River	Wood or Timber	Slab	3	793			66	33.01	2178.66	x							
10349	78308H00016B010	Townline Road	Big Swan Creek	Wood or Timber	Slab	2	118			48	31.17	1496.16	x							
10350	78308H00020B010	Prairie River Road	Prairie River	Wood or Timber	Slab	2	160	Posted	42 / 55 / 73	52	31.82	1654.64	x							
10351	78308H00024B010	McKale Road	Prairie River	Wood or Timber	Slab	2	87			44	26.21	1153.24	x							
10352	78308H00030B010	Needham Road	Prairie River	Wood or Timber	Slab	2	70			44	28.22	1241.68	x							
10353	78308H00031B010	Needham Road	Big Swan Creek	Wood or Timber	Slab	2	54			64	29.49	1887.36	x							
10354	78308H00032B010	Middle Colon Road	Big Swan Creek	Wood or Timber	Slab	1	234			28	29.69	831.32	x							
10355	78309H00027B010	Null Road	Rocky River	Wood or Timber	Slab	2	418	Posted	42 / 55 / 73	52	30.51	1586.52	x							
10357	78310H00002B010	Hoshel Road	Prairie River	Wood or Timber	Slab	4	182			80	32.15	2572	x							
10358	78310H00019B010	Constantine Street	St Joseph River	Wood or Timber	Slab	12	1384	Posted	42 / 64 / 82	240	31.82	7636.8	x			x				
10360	78310H00030B010	Carpenter Road	Portage River	Wood or Timber	Slab	4	66			88	31.17	2742.96	x							
10362	78311A00003B010	Findley Road	Prairie River	Wood or Timber	Slab	5	527			100	31.82	3182	x							
10364	78311A00029B010	Rambadt Road	Prairie River	Wood or Timber	Slab	3	304	Posted	31 / 51 / 67	78	31.82	2481.96	x							
10365	78311A00031B010	Rambadt Road	Spring Creek	Wood or Timber	Slab	2	97			32	31.5	1008	x							
10367	78311A00040B010	Bucknell Road	Spring Creek	Wood or Timber	Slab	1	40			28	29.49	825.72	x							
10368	78311A00042B010	Filmore Road	Prairie River	Wood or Timber	Slab	3	127			66	31.82	2100.12	x							
10370	78312H00009B010	Hagelgans Road	Washburn Creek	Wood or Timber	Slab	1	38			30	22.51	675.3	x							
10371	78312H00011B010	Custer Road	Washburn Creek	Wood or Timber	Slab	1	56			28	29	812	x							
10374	78313H00030B010	Delong Road	Rocky River	Wood or Timber	Slab	2	49			32	31.2	998.4	x							
10375	78313H00038B010	Flatbush Road	Rocky River	Wood or Timber	Slab	2	126	Posted	31 / 51 / 67	52	26.25	1365	x							
10377	78315H00004B010	Prairie Corner Road	St Joseph River	Wood or Timber	Slab	6	NA (532)	Posted	8	156	31.5	4914	x			x				
10378	78315H00019B010	Flach Road	Beak Creek	Wood or Timber	Slab	1	152			28	31.17	872.76	x							
10380	78315H00032B010	Hallam Road	Beak Creek	Wood or Timber	Slab	2	100			32	31.82	1018.24	x							
10382	78316H00013B010	Kings Mill Road	Mill Race	Wood or Timber	Slab	1	167			24	20.01	480.24	x							
10383	78316H00013B020	Kings Mill Road	Nottawa Creek	Wood or Timber	Slab	4	167			88	31.17	2742.96	x			x				
10384	78316H00029B010	Olney Road	Nottawa Creek	Wood or Timber	Slab	4	115			88	31.17	2742.96	x							
10385	78316H00033B010	Lawrence Road	Beak Creek	Wood or Timber	Slab	1	26			27	29.49	796.23	x							
10386	78316H00040B010	Shorts Road	Nottawa Creek	Wood or Timber	Slab	3	159			66	31.18	2057.88	x							
14344	78309H00018N010	Coon Hollow	Little Pheasant Lake Outlet	Steel	Stringer/Girder	1				18	24	432	x							
Timber Stringer/Girder																				
10300	78200032000B020	Michigan Avenue	Little Portage Creek	Wood or Timber	Stringer/Girder	1	456	Posted	42	32	31.82	1018.24	x							
10381	78315H00046B010	McClish Road	Portage Creek	Wood or Timber	Stringer/Girder	1	NA	Posted	42	32	31.5	1008	x							

Inventory Data													Inspection Items							
Struct. Nbr.	Bridge ID	Facility Carried	Features Intersected	Structure Type 43A	Structure Type 43B	Number of Main Spans	ADT	Posted	Load Rating	Total Str Length	Total Str Width	Total Str Area	Initial Inspection	In Depth Steel Inspection	Pin and Hanger Inspection	Diving Inspection	Provide Monitoring	Review Scour Criticality	Load Rating	Update SIA
Timber Culvert																				
10291	78200006000B010	Crooked Creek Road	Klinger Lake Outlet	Wood or Timber	Culvert	3	579			21	37.73	792.33								
Timber Truss																				
10314	78200050000B020	Covered Bridge Road	St Joseph River	Wood or Timber	Truss-Thru	3	2099	Posted	3	280	16.08	4502.4	x			x				
Steel Stringer/Girder																				
10288	78200003000B010	Fawn River Road	Fawn River	Steel	Stringer/Girder	1	1594			80	29.2	2336	x							
10296	78200027000B010	Wattles Road	McArty Drain	Steel	Stringer/Girder	1	1362			30	31.82	954.6	x							
10369	7811A0043B010	Waterspaugh Rd	Spring Creek	Steel	Stringer/Girder	1	50	Posted	6	19.5	20.3	395.85	x							
Steel Culvert																				
14529	78316H00016C010	Lawrence Road	Bear Creek	Streel	Culvert	4	26			25.2			x							
14530	78316H00019C010	Longnecker Road	Bear Creek	Streel	Culvert	4	57			26.4			x							
14531	78200060000C010	Fulton Road	Bear Creek	Streel	Culvert	3	1113			24			x							
14532	78200040000C010	Pulver Road	Bear Creek	Streel	Culvert	3	336			20.8			x							
Steel Tub Girder																				
10316	78200051000B010	Nottawa Road	Prairie River	Steel	Box Beam Spread	2	1177			60	33.46	2007.6	x			x				
10377	78315H00004B010	Prairie Corner Road	St Joseph River	Steel	Box Beam Spread	3	532			179	33	5907								
Aluminum Culvert																				
14592	78200048000C010	Shimmel Road	Sherman Mill Creek	Aluminum	Culvert	1	2225			21.9	99	2168.1	x							

C. CULVERT ASSET MANAGEMENT PLAN SUPPLEMENT

Culvert Primer

Culverts are structures that lie underneath roads, enabling water to flow from one side of the roadway to the other (Figure C-1 and Figure C-2). The important distinguishing factor between a culvert and a bridge is the size. Culverts are considered anything under 20 feet while bridges, according to the Federal Highway Administration, are 20 feet or more. While similar in function to storm sewers, culverts differ from storm sewers in that culverts are open on both ends, are constructed as straight-line conduits, and lack intermediate drainage structures like manholes and catch basins. Culverts are critical to the service life of a road because of the important role they play in keeping the pavement layers well drained and free from the forces of water building up on one side of the roadway.

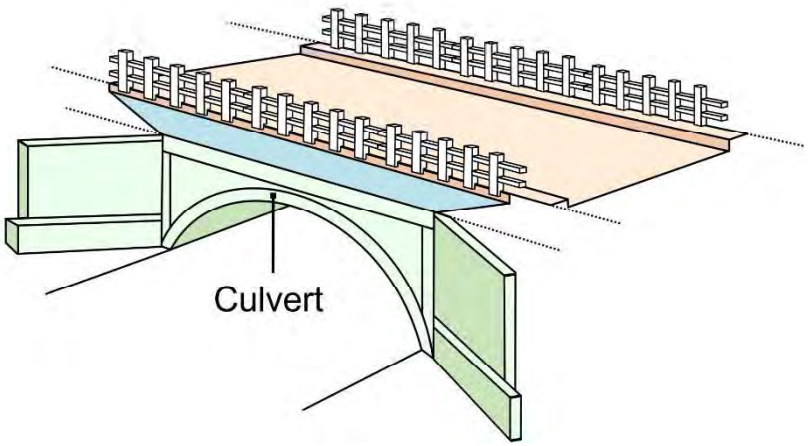


Figure C-1: Diagram of a culvert structure

Figure C-2: Examples of culverts. Culverts allow water to pass under the roadway (left), they are straight-line conduits with no intermediate drainage structures (middle), and they come in various materials (left: metal; middle and right: concrete) and shapes (left: arch; middle: round; right: box).

Culvert Types

Michigan conducted its first pilot data collection on local agency culverts in the state in 2018. Of almost 50,000 culverts inventoried as part of the state-wide pilot project, the material type used for constructing culverts ranged from (in order of predominance) corrugated steel, concrete, plastic, aluminum, and masonry/tile, to timber materials. The shapes of the culverts were (in order of predominance) circular, pipe arch, arch, rectangular, horizontal ellipse, or box. The diameter for the majority of culverts ranged from less than 12 inches to 24 inches; a portion, however, ranged from 30 inches to more than 48 inches.

Culvert Condition

Several culvert condition assessment practices exist. The FHWA has an evaluation method in its 1986 *Culvert Inspection Manual*. In conjunction with descriptions and details in the Ohio Department of Transportation's 2017 *Culvert Inspection Manual* and Wisconsin DOT's *Bridge Inspection Field Manual*, the FHWA method served as the method for evaluating Michigan culverts in the pilot. In 2018, Michigan local agencies participated in a culvert pilot data collection, gathering inventory and condition data; full detail on the condition assessment system used in the data collection can be found in Appendix G of the final report (https://www.michigan.gov/documents/tamc/TAMC_2018_Culvert_Pilot_Report_Complete_634795_7.pdf).

The Michigan culvert pilot data collection used a 1 through 10 rating system, where 10 is considered a new culvert with no deterioration or distress and 1 is considered total failure. Each of the different culvert material types requires the assessment of features unique to that material type, including structural deterioration, invert deterioration, section deformation, blockage(s) and scour. Corrugated metal pipe, concrete pipe, plastic pipe, and masonry culverts require an additional assessment of joints and seams. Slab abutment culverts require an additional assessment of the concrete abutment and the masonry abutment. Assessment of timber culverts only relied on blockage(s) and scour. The assessments come together to generate condition rating categories of good (rated as 10, 9, or 8), fair (rated as 7 or 6), poor (rated as 5 or 4), or failed (rated as 3, 2, or 1).

Culvert Treatments

The *MDOT Drainage Manual* addresses culvert design and treatments. Of most importance to the longevity of culverts is regular cleaning to prevent clogs. More extensive treatments may include re-positioning the pipe to improve its grade and lining a culvert to achieve more service life after structural deterioration has begun.

D. TRAFFIC SIGNALS ASSET MANAGEMENT PLAN SUPPLEMENT

Traffic Signals Primer

Types

Electronic traffic control devices come in a large array of configurations, which include case signs (e.g., keep right/left, no right/left turn, reversible lanes), controllers, detection (e.g., cameras, push buttons), flashing beacons, interconnects (e.g., DSL, fire station, phone line, radio), pedestrian heads (e.g., hand-man), and traffic signals. This asset management plan is only concerned with traffic signals (Figure D-1) as a functioning unit and does not consider other electronic traffic control devices.

Figure D-1: Example of traffic signals

Condition

Traffic signal assessment considers the functioning of basic tests on a pass/fail basis. These tests include battery backup testing, components testing, conflict monitor testing, radio testing, and underground detection.

Treatments

Traffic signals are maintained in accordance with the *Michigan Manual on Uniform Traffic Control Devices*. Maintenance of traffic signals includes regular maintenance of all components, cleaning and servicing to prevent undue failures, immediate maintenance in the case of emergency calls, and provision of stand-by equipment. Timing changes are restricted to authorized personnel only.

E. GLOSSARY & ACRONYMS

Glossary

Alligator cracking: Cracking of the surface layer of an asphalt pavement that creates a pattern of interconnected cracks resembling alligator hide. This is often due to overloading a pavement, sub-base failure, or poor drainage.[5]

Asset management: A process that uses data to manage and track road assets in a cost-effective manner using a combination of engineering and business principles. Public Act 325 of 2018 provides a legal definition: "an ongoing process of maintaining, preserving, upgrading, and operating physical assets cost effectively, based on a continuous physical inventory and condition assessment and investment to achieve established performance goals".[6]

Biennial inspection: Inspection of an agency's bridges every other year, which happens in accordance with National Bridge Inspection Standards and Michigan Department of Transportation requirements.

Bridge inspection program: A program implemented by a local agency to inspect the bridges within its jurisdiction systematically in order to ensure proper functioning and structural soundness.

Capital preventative maintenance: Also known as CPM, a planned set of cost-effective treatments to address of fair-rated infrastructure before the structural integrity of the system has been severely impacted. These treatments aim to slow deterioration and to maintain or improve the functional condition of the system without significantly increasing the structural capacity. Light capital preventive maintenance is a set of treatments designed to seal isolated areas of the pavement from water, such as crack and joint sealing, to protect and restore pavement surface from oxidation with limited surface thickness material, such as fog seal; generally, application of a light CPM treatment does not provide a corresponding increase in a segment's PASER score. Heavy capital preventive maintenance is a set of surface treatments designed to protect pavement from water intrusion or environmental weathering without adding significant structural strength, such as slurry seal, chip seal, or thin (less than 1.5-inch) overlays for bituminous surfaces or patching or partial-depth (less than 1/3 of pavement depth) repair for concrete surfaces.

Chip seal: An asphalt pavement treatment method consisting of, first, spraying liquid asphalt onto the old pavement surface and, then, a single layer of small stone chips spread onto the wet asphalt layer.

City major: A road classification, defined in Michigan Public Act 51, that encompasses the generally more important roads in a city or village. City major roads are designated by a municipality's governing body and are subject to approval by the State Transportation Commission. These roads do not include roads under the jurisdiction of a county road commission or trunkline highways.

City minor: A road classification, defined in Michigan Public Act 51, that encompasses the generally less important roads in a city or village. These roads include all city or village roads that are not city major road and do not include roads under the jurisdiction of a county road commission.

[5] https://en.wikipedia.org/wiki/Crocodile_cracking
[6] Inventory-based Rating System for Gravel Roads: Training Manual

Composite pavement: A pavement consisting of concrete and asphalt layers. Typically, composite pavements are old concrete pavements that were overlaid with HMA in order to gain more service life.

Concrete joint resealing: Resealing the joints of a concrete pavement with a flexible sealant to prevent moisture and debris from entering the joints. When debris becomes lodged inside a joint, it inhibits proper movement of the pavement and leads to joint deterioration and spalling.

Concrete pavement: Also known as rigid pavement, a pavement made from portland cement concrete. Concrete pavement has an average service life of 30 years and typically does not require as much periodic maintenance as HMA.

Cost per lane mile: Associated cost of construction, measured on a per lane, per mile basis. Also see *lane-mile segment*.

County local: A road classification, defined in Michigan Public Act 51, that encompasses the generally less important and low-traffic roads in a county. This includes all county roads that are not classified as county primary roads.

County primary: A road classification, defined in Michigan Public Act 51, that encompasses the generally more important and high-traffic roads in a county. County primary roads are designated by board members of the county road commissions and are subject to approval by the State Transportation Commission.

CPM: See *Capital preventive maintenance*.

Crack and seat: A concrete pavement treatment method that involves breaking old concrete pavement into small chunks and leaving the broken pavement in place to provide a base for a new surface. This provides a new wear surface that resists water infiltration and helps prevent damaged concrete from reflecting up to the new surface.

Crack seal: A pavement treatment method for both asphalt and concrete pavements that fills cracks with asphalt materials, which seals out water and debris and slows down the deterioration of the pavement. Crack seal may encompass the term "crack filling".

Crush and shape: An asphalt pavement treatment method that involves pulverizing the existing asphalt pavement and base and then reshaping the road surface to correct imperfections in the road's profile. Often, a layer of gravel is added along with a new wearing surface such as an HMA overlay or chip seal.

Crust: A very tightly compacted surface on an unpaved road that sheds water with ease but takes time to be created.

Culvert: A pipe or structure used under a roadway that allows cross-road drainage while allowing traffic to pass without being impeded; culverts span up to 20 feet.[7]

Dowel bar retrofit repair: A concrete pavement treatment method that involves cutting slots in a cracked concrete slab, inserting steel bars into the slots, and placing concrete to cover the new bars and fill the slots. It aims to reinforce cracks in a concrete pavement.

[7] Adapted from Inventory-based Rating System for Gravel Roads: Training Manual

Dust control: A gravel road surface treatment method that involves spraying chloride or other chemicals on the gravel surface to reduce dust loss, aggregate loss, and maintenance. This is a relatively short-term fix that helps create a crusted surface.

Expansion joint: Joints in a bridge that allow for slight expansion and contraction changes in response to temperature. Expansion joints prevent the build up of excessive pressure, which can cause structural damage to the bridge.

Federal Highway Administration: Also known as FHWA, this is an agency within the U.S. Department of Transportation that supports state and local governments in the design, construction, and maintenance of the nation's highway system.[8]

Federal-aid network: Portion of road network that is comprised of federal-aid routes. According to Title 23 of the United States Code, federal-aid-eligible roads are "highways on the federal-aid highways systems and all other public roads not classified as local roads or rural minor collectors".[9] Roads that are part of the federal-aid network are eligible for federal gas-tax monies.

FHWA: See *Federal Highway Administration*.

Flexible pavement: See *hot-mix asphalt pavement*.

Fog seal: An asphalt pavement treatment method that involves spraying a liquid asphalt coating onto the entire pavement surface to fill hairline cracks and prevent damage from sunlight and oxidation. This method works best for good to very good pavements.

Full-depth concrete repair: A concrete pavement treatment method that involves removing sections of damaged concrete pavement and replacing it with new concrete of the same dimensions in order to restore the riding surface, delay water infiltration, restore load transfer from one slab to the next, and eliminate the need to perform costly temporary patching.

Geographic divides: Areas where a geographic feature (e.g., river, lake, mountain) limits crossing points of the feature.

Grants: Competitive funding gained through an application process and targeted at a specific project type to accomplish a specific purpose. Grants can be provided both on the federal and state level and often make up part of the funds that a transportation agency receives.

Gravel surfacing: A low-cost, easy-to-maintain road surface made from aggregate and fines.

Heavy capital preventive maintenance: See *Capital preventive maintenance*.

HMA: See *hot-mix asphalt pavement*.

Hot-mix asphalt overlay: Also known as HMA overlay, this a surface treatment that involves layering new asphalt over an existing pavement, either asphalt or concrete. It creates a new wearing surface for traffic and to seal the pavement from water, debris, and sunlight damage, and it often adds significant structural strength.

Hot-mix asphalt pavement: Also known as HMA pavement, this type of asphalt creates a flexible pavement composed of aggregates, asphalt binder, and air voids. HMA is heated for placement and

[8] Federal Highway Administration webpage https://www.fhwa.dot.gov/
[9] Inventory-based Rating System for Gravel Roads: Training Manual

compaction at high temperatures. HMA is less expensive to construct than concrete pavement, however it requires frequent maintenance activities and generally lasts 18 years before major rehabilitation is necessary. HMA makes up the vast majority of local-agency-owned pavements.

IBR: See *IBR element*, *IBR number*, and/or *Inventory-based Rating System™*.

IBR element: A feature used in the IBR System™ for assessing the condition of roads. The system relies on assessing three elements: surface width, drainage adequacy, and structural adequacy.[10]

IBR number: The 1-10 rating determined from assessments of the weighted IBR elements. The weighting relates each element to the intensity road work needed to improve or enhance the IBR element category.[11]

Interstate highway system: The road system owned and operated by each state consisting of routes that cross between states, make travel easier and faster. The interstate roads are denoted by the prefix "I" or "U.S." and then a number, where odd routes run north-south and even routes run east-west. Examples are I-75 or U.S. 2.[12]

Inventory-based Rating System™: Also known as the IBR System™, a rating system designed to assess the capabilities of gravel and unpaved roads to support intended traffic volumes and types year round. It assesses roads based on how three IBR elements, or features—surface width, drainage adequacy, and structural adequacy—compare to a baseline, or "good", road.[13]

Investment Reporting Tool: Also known as IRT, a web-based system used to manage the process for submitting required items to the Michigan Transportation Asset Management Council. Required items include planned and completed maintenance and construction activity for roads and bridges and comprehensive asset management plans.

IRT: See *Investment Reporting Tool*.

Jurisdiction: Administrative power of an entity to make decisions for something. In Michigan, the three levels of jurisdiction classification for transportation assets are state highways, county roads, and city and village streets. State highways are under the jurisdiction of the Michigan Department of Transportation, county roads are under the jurisdiction of the road commission for the county in which the roads are located, and city and village streets are under the jurisdiction of the municipality in which the roads are located.

Jurisdictional borders: Borders between two road-owning-agency jurisdictions, or where the roads owned by one agency turn into roads owned by another agency. Examples of jurisdictional borders are township or county lines.

Lane-mile segment: A segment of road that is measured by multiplying the centerline miles of a roadway by the number of lanes present.

Lane-mile-years: A network's total lane-miles multiplied by one year; a method to quantify the measurable loss of pavement life.

[10] Inventory-based Rating System for Gravel Roads: Training Manual
[11] Inventory-based Rating System for Gravel Roads: Training Manual
[12] https://www.fhwa.dot.gov/interstate/faq.cfm#question3
[13] Adapted from Inventory-based Rating System for Gravel Roads: Training Manual

Light capital preventive maintenance: See *Capital preventive maintenance*.

Limited access areas: Areas—typically remote areas—serviced by few or seasonal roads that require long detours routes if servicing roads are closed.

Main access to key commercial districts: Areas where large number or large size business will be significantly impacted if a road is unavailable.

Maintenance grading: A surface treatment method for unpaved roads that involves re-grading the road to remove isolated potholes, washboarding, and ruts, and then restoring the compacted crust layer.

MDOT: See *Michigan Department of Transportation*.

MDOT's Local Bridge Program Call for Projects: A call for project proposals for replacement, rehabilitation, and/or preventive maintenance of local bridges that, if granted, receives bridge funding from the Michigan Department of Transportation. The Call for Projects is made by the Local Bridge Program.

MGF: See *Michigan Geographic Framework*.

Michigan Department of Transportation: Also known as MDOT, this is the state of Michigan's department of transportation, which oversees roads and bridges owned by the state or federal government in Michigan.

Michigan Geographic Framework: Also known as MGF, this is the state of Michigan's official digital base map that contains location and road information necessary to conduct state business. The Michigan Department of Transportation uses the MGF to link transportation assets to a physical location.

Michigan Public Act 51 of 1951: Also known as PA 51, this is a Michigan legislative act that served as the foundation for establishing a road funding structure by creating transportation funding distribution methods and means. It has been amended many times.[14]

Michigan Public Act 325 of 2018: Also known as PA 325, this legislation modified PA 51 of 1951 in regards to asset management in Michigan, specifically 1) re-designating the TAMC under Michigan Infrastructure Council (MIC); 2) promoting and overseeing the implementation of recommendations from the regional infrastructure asset management pilot program; 3) requiring local road three-year asset management plans beginning October 1, 2020; 4) adding asset classes that impact system performance, safety or risk management, including culverts and signals; 5) allowing MDOT to withhold funds if no asset management plan submitted; and 6) prohibiting shifting finds from a country primary to a county local, or from a city major to a city minor if no progress toward achieving the condition goals described in its asset plan.[15]

Michigan Public Act 499 of 2002: Also known as PA 499, this legislation requires road projects for the upcoming three years to be reported to the TAMC.

Michigan Transportation Asset Management Council: Also known as the TAMC, a council comprised of professionals from county road commissions, cities, a county commissioner, a township official, regional and metropolitan planning organizations, and state transportation department personnel. The

[14] Inventory-based Rating System for Gravel Roads: Training Manual
[15] Inventory-based Rating System for Gravel Roads: Training Manual

council reports directly to the Michigan Infrastructure Council.[16] The TAMC provides resources and support to Michigan's road-owning agencies, and serves as a liaison in data collection requirements between agencies and the state.

Michigan Transportation Fund: Also known as MTF, this is a source of transportation funding supported by vehicle registration fees and the state's per-gallon gas tax.

Microsurface treatment: An asphalt pavement treatment method that involves applying modified liquid asphalt, small stones, water, and portland cement for the purpose of protecting a pavement from damage caused by water and sunlight.

Mill and hot-mix asphalt overlay: Also known as a mill and HMA overlay, this is a surface treatment that involves the removal of the top layer of pavement by milling and the replacement of the removed layer with a new HMA layer.

Mix-of-fixes: A strategy of maintaining roads and bridges that includes generally prioritizes the spending of money on routine maintenance and capital preventive maintenance treatments to impede deterioration and then, as money is available, performing reconstruction and rehabilitation.

MTF: See *Michigan Transportation Fund*.

National Bridge Inspection Standards: Also known as NBIS, standards created by the Federal Highway Administration to locate and evaluate existing bridge deficiencies in the federal-aid highway system to ensure the safety of the traveling public. The standards define the proper safety for inspection and evaluation of all highway bridges.[17]

National Center for Pavement Preservation: Also known as the NCPP, a center that offers education, research, and outreach in current and innovative pavement preservation practices. This collaborative effort of government, industry, and academia entities was established at Michigan State University.

National Functional Class: Also known as NFC, a federal grouping system for public roads that classifies roads according to the type of service that the road is intended to provide.

National highway system: Also known as NHS, this is a network of roads that includes the interstate highway system and other major roads managed by state and local agencies that serve major airports, marine, rail, pipelines, truck terminals, railway stations, military bases, and other strategic facilities.

NBIS: See *National Bridge Inspection Standards*.

NCPP: See *National Center for Pavement Preservation*.

NCPP Quick Check: A system created by the National Center for Pavement Preservation that works under the premise that a one-mile road segment loses one year of life each year that it is not treated with a maintenance, rehabilitation, or reconstruction project.

NFC: See *National Functional Class*.

Non-trunkline: A local road intended to be used over short distances but not recommended for long-distance travel.

[16] Inventory-based Rating System for Gravel Roads: Training Manual
[17] https://www.fhwa.dot.gov/bridge/nbis/

Other funds: Expenditures for equipment, capital outlay, debt principal payment, interest expense, contributions to adjacent governmental units, principal, interest and bank fees, and miscellaneous for cities and villages.

PA: See *Michigan Public Act 51*, *Michigan Public Act 325*, and/or *Michigan Public Act 499*.

Partial-depth concrete repair: A concrete pavement treatment method that involves removing spalled or delaminated areas of concrete pavement, usually near joints and cracks, and replacing with new concrete. This is done to provide a new wearing surface in isolated areas, to slow down water infiltration, and to help delay further freeze-thaw damage.

PASER: See *Pavement Surface Evaluation and Rating system*.

Pavement reconstruction: A complete removal of the old pavement and base and construction of an entirely new road. This is the most expensive rehabilitation of the roadway and also the most disruptive to traffic patterns.

Pavement Surface Evaluation and Rating system: Also known as the PASER system, the PASER system rates surface condition on a 1-10 scale, where 10 is a brand new road with no defects, 5 is a road with distress but that is structurally sound and requires only preventative maintenance, and 1 is a road with extensive surface and structural distresses that is in need of total reconstruction. This system provides a simple, efficient, and consistent method for evaluating the condition of paved roads.[18]

Pothole: A defect in a road that produces a localized depression.[19]

Preventive maintenance: Planned treatments to an existing asset to prevent deterioration and maintain functional condition. This can be a more effective use of funds than the costly alternative of major rehabilitation or replacement.

Proactive preventive maintenance: Also known as PPM, a method of performing capital preventive maintenance treatments very early in a pavement's life, often before it exhibits signs of pavement defect.

Public Act 51: See *Michigan Public Act 51 of 1951*

Public Act 325: See *Michigan Public Act 325 of 2018*

Public Act 499: See *Michigan Public Act 499 of 2002*

Reconstruction and rehabilitation programs: Programs intended to reconstruct and rehabilitate a road.

Restricted load postings: A restriction enacted on a bridge structure when is incapable of transporting a state's legal vehicle loads.

Rights-of-way ownership: The owning of the right-of-way, which is the land over which a road or bridge travels. In order to build a road, road agencies must own the right-of-way or get permission to build on it.

Rigid pavement: See *concrete pavement*.

[18] Adapted from Inventory-based Rating System for Gravel Roads: Training Manual
[19] Inventory-based Rating System for Gravel Roads: Training Manual

Road infrastructure: An agency's road network and assets necessary to make it function, such as traffic signage and ditches.

Road: The area consisting of the roadway (i.e., the travelled way or the portion of the road on which vehicles are intended to drive), shoulders, ditches, and areas of the right of way containing signage.[20]

Roadsoft: An asset management software suit that enables agencies to manage road and bridge related infrastructure. The software provides tools for collecting, storing, and analyzing data associated with transportation infrastructure. Built on an optimum combination of database engine and GIS mapping tools, Roadsoft provides a quick, smooth user experience and almost unlimited data handling capabilities.[21]

Ruts/rutting: Deformation of a road that usually forms as a permanent depression concentrated under the wheel path parallel to the direction of travel.[22]

Scheduled maintenance: Low-cost, day-to-day activities applied to bridges on a scheduled basis that mitigates deterioration.[23]

Sealcoat pavement: A gravel road that has been sealed with a thin asphalt binder coating that has stone chips spread on top.

Service life: Time from when a road or treatment is first constructed to when it reaches a point where the distresses present change from age-related to structural-related (also known as the critical distress point).[24]

Slurry seal: An asphalt pavement treatment method that involves applying liquid asphalt, small stones, water, and portland cement in a very thin layer with the purpose of protecting an existing pavement from being damaged by water and sunlight.

Structural improvement: Pavement treatment that adds strength to the pavement. Roads requiring structural improvement exhibit alligator cracking and rutting and are considered poor by the TAMC definitions for condition.

Subsurface infrastructure: Infrastructure maintained by local agencies that reside underground, for example, drinking water distribution systems, wastewater collection systems, and storm sewer systems.

TAMC: See *Michigan Transportation Asset Management Council*.

TAMC pavement condition dashboard: Website for viewing graphs of pavement and bridge conditions, traffic and miles travelled, safety statistics, maintenance activities, and financial data for Michigan's cities and villages, counties, and regions, as well as the state of Michigan.

TAMC's good/fair/poor condition classes: Classification of road conditions defined by the Michigan Transportation Asset Management Council based on bin ranges of PASER scores and similarities in defects and treatment options. Good roads have PASER scores of 8, 9, or 10, have very few defects, and require minimal maintenance. Fair roads have PASER scores of 5, 6, or 7, have good structural support but a deteriorating surface, and can be maintained with CPM treatments. Poor roads have PASER scores

[20] Inventory-based Rating System for Gravel Roads: Training Manual
[21] Inventory-based Rating System for Gravel Roads: Training Manual
[22] Paving Class Glossary
[23] Inventory-based Rating System for Gravel Roads: Training Manual
[24] Inventory-based Rating System for Gravel Roads: Training Manual

of 1, 2, 3, or 4, exhibit evidence that the underlying structure is failing, such as alligator cracking and rutting. These roads must be rehabilitated with treatments like heavy overlay, crush and shape, or total reconstruction.

Tax millages: Local tax implemented to supplement an agency's budget, such as road funding.

Thin hot-mix asphalt overlay: Application of a thin layer of hot-mix asphalt on an existing road to re-seal the road and protect it from damage caused by water. This also improves the ride quality and provides a smoother, uniform appearance that improves visibility of pavement markings.[25]

Transportation infrastructure: All of the elements that work together to make the surface transportation system function including roads, bridges, culverts, traffic signals, and signage.

Trigger: When a PASER score gives insight to the preferred timeline of a project for applying the correct treatment at the correct time.

Trunkline abbreviations: The prefixes *M-*, *I-*, and *US* indicate roads in Michigan that are part of the state trunkline system, the Interstate system, and the US Highway system. These roads consist of anything from 10-lane urban freeways to two-lane rural highways and even one non-motorized highway; they cover 9,668 centerline miles. Most of the roads are maintained by MDOT.

Trunkline bridges: Bridge present on a trunkline road, which typically connects cities or other strategic places and is the recommended rout for long-distance travel.[26]

Trunkline maintenance funds: Expenditures under a maintenance agreement with MDOT for maintenance activities performed on MDOT trunkline routes.

Trunkline: Major road that typically connects cities or other strategic places and is the recommended route for long-distance travel.[27]

Washboarding: Ripples in the road surface that are perpendicular to the direction of travel.[28]

Wedge/patch sealcoat treatment: An asphalt pavement treatment method that involves correcting the damage frequently found at the edge of a pavement by installing a narrow, 2- to 6-foot-wide wedge along the entire outside edge of a lane and layering with HMA. This extends the life of an HMA pavement or chip seal overlay by adding strength to significantly settled areas of the pavement.

Worst-first strategy: Asset management strategy that treats only the problems, often addressing the worst problems first, and ignoring preventive maintenance. This strategy is the opposite of the "mix of fixes" strategy. An example of a worst-first approach would be purchasing a new automobile, never changing the oil, and waiting till the engine fails to address any deterioration of the car.

[25] [second sentence] http://www.kentcountyroads.net/road-work/road-treatments/ultra-thin-overlay
[26] https://en.wikipedia.org/wiki/Trunk_road
[27] https://en.wikipedia.org/wiki/Trunk_road
[28] Inventory-based Rating System for Gravel Roads: Training Manual

List of Acronyms

CPM: capital preventive maintenance

FHWA: Federal Highway Administration

HMA: hot-mix asphalt

I: trunkline abbreviation for routes on the Interstate system

IBR: Inventory-based Rating

M: trunkline abbreviation for Michigan state highways

MDOT: Michigan Department of Transportation

MTF: Michigan Transportation Fund

NBIS: National Bridge Inspection Standards

NCPP: National Center for Pavement Preservation

NHS: National Highway System

PA 51: Michigan Public Act 51 of 1951

PASER: Pavement Surface Evaluation and Rating

R&R: reconstruction and rehabilitation programs

TAMC: (Michigan) Transportation Asset Management Council

US: trunkline abbreviation for routes on the US Highway system