MICHIGAN'S 2023 Roads & Bridges

ANNUAL REPORT

TAMC
Michigan
Transportation Asset
Management Council

Dear Reader,

On behalf of the Michigan Transportation Asset Management Council (TAMC), I am thrilled to present the 2023 Roads and Bridges Annual Report. This report stands as a testament to our collective efforts in advancing asset management practices throughout Michigan's road-owning agencies.

Since its inception under Public Act (PA) 499 of 2002, the TAMC has continually evolved its mission. Today, our focus extends beyond the realms of roads and bridges to encompass a broader strategy in collaboration with the Michigan Infrastructure Council (MIC) and the Water Asset Management Council (WAMC). Together, we strive to develop a comprehensive statewide asset management strategy that addresses the diverse needs of our infrastructure.

I extend my deepest gratitude to every individual and entity that has played a role in shaping the TAMC over the years. Whether through direct participation, data collection, or strategic planning, your contributions have been invaluable in laying the foundation for our present achievements. Our success is indebted to the commitment of the numerous road-owning agencies across the state. Your diligent data collection efforts, informed decision-making, and dedication to public education have been instrumental in our progress.

As we move forward, I urge you to continue engaging with our training programs and utilizing our data visualization tools to showcase your work effectively. Your ongoing participation and feedback are crucial in shaping the future direction of asset management in Michigan. Additionally, I encourage you to consider submitting nominations for TAMC awards, as they provide an opportunity for us to celebrate and recognize your outstanding contributions.

I extend my heartfelt thank you to the current TAMC members for their leadership and dedication to advancing asset management efforts statewide. I want to recognize our supporting administration team for their vision and dedication to asset management principles. Together, our commitment is vital in driving our initiatives forward, and I am grateful for your continued support.

In conclusion, I extend my sincere appreciation to each and every one of you for your unwavering dedication to the TAMC's mission. Together, we will continue to elevate asset management practices and ensure the longevity and resilience of Michigan's infrastructure.

If you have any questions, please contact either me or the TAMC Coordinator at splumer@hrcengr.com

Sincerely,

Joanna I. Johnson

Joanna I. Johnson, TAMC Chair

Major Takeaways from 2023
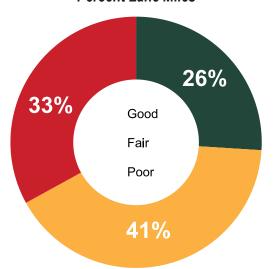
Education and Training

There has been an increase in TAMC-related training and educational seminars throughout the state from 2022 to 2023, including for culvert data collection. (See Training Activities)
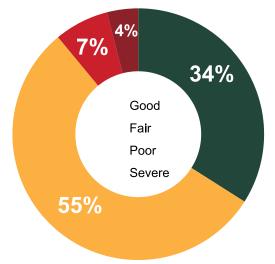
Investment Reporting

Project information from the 617 transportation agencies was used to assist condition forecasts. A first look at Transportation Asset Management Plan (TAMP) submissions provides insights. (See Investment Reporting)

Roads

An increase to 26% of roads in good condition, while 33% remain in poor condition. Continued collection on non-federal-aid roads and gravel road ratings from 2021-2023. (See 2023 Road Condition)

Bridges

Added investment allowed bridges statewide to maintain 2022 conditions. In 2023, 67 local agency bridges were closed due to poor and severe conditions, two less than in 2022. Long-term funding challenges continue. (See 2023 Bridge Condition)

2023 Federal-Aid Pavement Condition

Percent Lane Miles

Good
Fair
Poor

26%
41%
33%

To see dashboards for all agencies and an interactive map, visit www.Michigan.gov/TAMC

2023 Bridge Condition

All Roadway Bridges

Good
Fair
Poor
Severe

34%
55%
7%
4%

Transportation Asset Management Council (TAMC)

To develop and support excellence in managing Michigan's transportation assets by:

- Advising the Legislature, the Michigan Infrastructure Council (MIC), State Transportation Commission, and transportation committees.

- Promote asset management principles.

- Provide tools and practices for road agencies.

- Collaborate and coordinate with the Water Asset Management Council (WAMC).

TAMC members for 2023 and the organizations they represent:

Joanna I. Johnson (TAMC Chair), County Road Association of Michigan
William McEntee (TAMC Vice-Chair), County Road Association of Michigan
Ryan Buck, Michigan Transportation Planning Association
Arthur J. Green, P.E., Michigan Department of Transportation
Eric Mullen, Michigan Department of Transportation
Jacob Hurt, Michigan Association of Regions
James Hurt, Michigan Municipal League
Kelly R. Jones, P.E., Michigan Association of Counties
Robert Slattery Jr., Michigan Municipal League
Rob Surber, Michigan Department of Technology, Management and Budget (Non-Voting)
Jennifer Tubbs, Michigan Townships Association

For added background on TAMC, its members, and its related legislation, please visit the About Us section on the TAMC website at: www.Michigan.gov/mic/TAMC

Special Thanks:

MDOT Administrative Support
Brad Sharlow, Manager
Eric Costa
Dave Jennett
Gloria Strong

Other MDOT Support
Jacob Armour
Keith Cooper
Mike Halloran
Kari Linn
Laura Loomis
Matt Moulton

CSS
John Clark
Cheryl Granger
Mark Holmes
Jeri Kaminski
Courtney Peterson
Thomas Ro

MTU
Scott Bershing
Tim Colling
Chris Gilbertson
Pete Torola

Other Support
Al Halbeisen
Brian Vilmont
Wayne Harrall

Table of Contents

Midland, Michigan

2023 Year in Review

Kalamazoo County

TAMC Highlights and Accomplishments

Below is a 2023 highlights and accomplishments list, with added details spread throughout this report.

- Hosted 23rd Annual Conference.

- Increased participation in asset management training for local officials and culvert training.

- Updated road surface condition and culvert inventory and condition data collection policies.

- Used Investment Reporting Tool (IRT) road and bridge projects in the pavement and bridge condition forecasts.

- Created a new live culvert condition dashboard and interactive map layer that updates as new data is submitted by an agency.

- Over 320 road agencies collected road condition data on 90% of their federal-aid lane miles.

- Over 8,000 road and bridge improvement projects were reported by road agencies covering over 24,000 lane miles. (2022/23)

- Hired Hubbell, Roth & Clark, Inc. (HRC) through a Request for Services to serve as the TAMC Coordinator consultant.

To learn more on TAMC Policies, Dashboards, and Interactive Map:
TAMC Policies
TAMC Dashboards
TAMC Interactive Map (IMAP)

A Special Thank You:

The Center for Technology & Training at Michigan Technological University (MTU) has provided valuable education and data analysis support to the TAMC.

In 2023, they published three reports that provide the TAMC with valuable information that can be utilized in providing statewide guidance and additional asset management efforts.

- AM Plan Evaluation of MI Local Agencies. A look at local road agency TAMPS submitted between 2020-2022.

- Culvert Asset Management (AM) Best Practices. A look at culvert asset management best practices in the country.

Meet the New TAMC Coordinator:

Sarah Plumer, PTP, is a certified Professional Transportation Planner (PTP) through the Transportation Professional Certification Board. Sarah has been in the Transportation Planning field for 12 years and has worked at a metropolitan planning organization, transit agencies, advocacy groups, and local road agencies. She has experience in asset management planning and data collection at the county and local community levels.

Annual TAMC Conference

The annual TAMC Conference was held in September in Grand Rapids, Michigan. This exciting event gave an opportunity for current professionals and experienced veterans to gather and learn more about asset management.

Attendees heard from the (MIC) and Southeast Michigan Council of Governments on their Infrastructure Coordination Project and highlights from the Transportation Research Board Conference. Other topics included the Level of Service for Asset Management, the National State of Practice, and information on the 2022 PASER Data Analysis in Michigan.

In 2024, the annual TAMC conference will be a joint event with the MIC and WAMC titled "Integrated Infrastructure Conference."

Award Winners

The TAMC has established the Organizational Achievement Award to acknowledge those agencies that have incorporated the principles of asset management and adopted an asset management plan to help guide their investment decisions. All Public Act 51 road agencies are eligible to be nominated for this award. Additionally, the TAMC wants to recognize individuals providing outstanding support for Asset Management and the TAMC. Nominees for the Carmine Palombo Individual Achievement Award can include elected officials, support staff from state agencies, regional/metropolitan planning organizations, county road commissions, local units of government, the education community, or other individuals involved in promoting Michigan's TAMC programs.

Carmine Palombo Individual Award Mr. Dennis Randolp, PE, Kalamazoo

Left to Right: Joanna Johnson, TAMC Chair; Tom Palumbo, Senior Civil Engineer, City of Kalamazoo; Anthony Ladd, Public Works Division Manager, City of Kalamazoo; Dennis Randolph, Traffic Engineer, City of Kalamazoo; James Ritsema, City Manager, City of Kalamazoo; Sarah Plumer, TAMC Coordinator; Gloria Strong, TAMC Departmental Technician

Organization Achievement Award Road Commission for Oakland County

Left to Right: Joanna Johnson, TAMC Chair; Gary Piotrowicz, Deputy Managing Director, Road Commission for Oakland County (RCOC); Carissa Markel, RCOC Planning Manager; Sarah Plumer, TAMC Coordinator; Gloria Strong, TAMC Departmental Technician; T.J. Connolly, RCOC Planner III

Training, Work Program, and Budget Overview

MTT/CTT Training Programs	Number of Training Events	Number of Participants
TAMC Conference	1	128
PASER Training	8	412
Tranportation Asset Management and Gravel Road Basics for Local Officials	3	166
Briand AM Training Series Workshop	1	5
IBR System Training	3	219
Pavement AMP Workshop	1	14
Culvert AM Webinar	2	250
Compliance Plan Training Web	3	37
Figures Provided by MTU's Training Report - Total:	22	1231
DTMB/CSS Training Programs	**Number of Training Events**	**Number of Participants**
IRT Training	6 webinars	264

FIGURE 1 – Source: TAMC 2023

Pete Torola, MTU

TAMC training in 2023 included both onsite sessions and continued virtual format training for greater access. Figure 1 shows the numerous trainings and outreach efforts that are defined in the TAMC strategic work program. Overall, there was an increase in attendance from 2022 to 2023 by over 300 additional participants. TAMC FY2023 Budget is shown in Figure 2 with a breakdown of all area expenses.

Note: Administrative staff is provided by MDOT and not included in the TAMC budget.

TAMC Strategic Work Program

FY2023 Budget Overview	
Regional Program and Data Collection	$1,116,400
Central Data Agency and Technology	$380,000
Training and Education Facilities	$350,000
Council Express	$30,000
Total	**$1,876,400**

FIGURE 2 – Source: TAMC 2023

Transportation Asset Management Plans (TAMPs)

Legislation from PA 325 of 2018 requires local road agencies with 100 or more miles of certified roads to submit a TAMP. These comprehensive plans provide local road agencies greater insight into their inventory of assets and future needs.

TAMP required elements include:

1. Asset Inventory (roads, bridges culverts, and signals)

2. Performance Goals

3. Risk of Failure Analysis

4. Anticipated Revenue and Expenditures

5. Performance Outcomes

6. Coordination Clause

7. Proof of Adoption by Governing Body

TAMC has created resources and training opportunities to assist local road agencies, including a template that utilizes the agencies' previous data collection efforts and dashboard summaries.

There are over 123 road agencies that are striving to meet these state legislative requirements. MDOT is mandated by the Moving Ahead for Progress in the 21st Century (MAP-21) legislation to develop a TAMP.

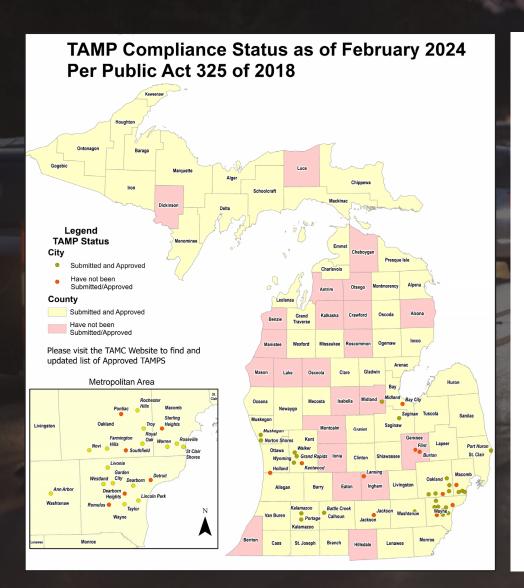To learn more on TAMPs, PA 325, and training opportunities:

Public Act 325
TAMP Resources and FAQs
Training
Asset Management Plan Templates Michigan Largest 123 Road Agencies

Transportation Asset Management Plans (continued)

TAMP Compliance Status as of February 2024 Per Public Act 325 of 2018

Legend
TAMP Status
City
● Submitted and Approved
● Have not been Submitted/Approved
County
  Submitted and Approved
  Have not been Submitted/Approved

Please visit the TAMC Website to find and updated list of Approved TAMPS

Metropolitan Area

As of February 2024, 71% of the local road agency TAMPs covering 2024-2026 have been submitted and approved as compliant. Updates to the TAMPs are due every three years on the schedule prescribed by the TAMC Policy for the Submittal and Review of Asset Management Plans for Roads, Bridges, and Transportation Infrastructure. A list of approved TAMPs can be found on the TAMC website and is updated on a biannual basis. (PA 325 Approved TAMPs)

On the horizon are two additional components of the PA 325 of 2018 legislation:

October 1, 2024 – TAMC will notify local road agencies required to submit a TAMP of their non-compliance if a TAMP or compliant TAMP has not been submitted by the October 1, 2024 deadline. Local road agencies will be given 120 days from notice to submit. If nothing is submitted, the TAMC shall notify MDOT of their non-compliance.
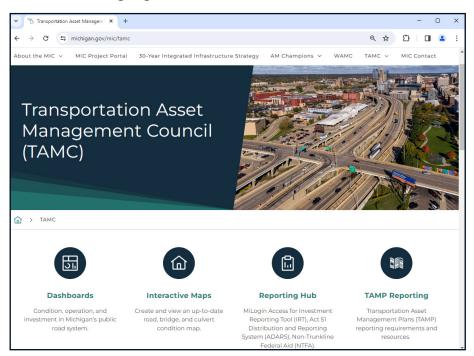
October 1, 2025 – TAMC shall provide notice to the local road agencies if they have not demonstrated progress toward achieving the condition goals described in their TAMP.

Website, Interactive Map, Dashboards, and Other Data Efforts

The TAMC website provides information on training, policies, conferences, and data efforts. It also includes tools to assist decision-makers in telling an accurate story of the conditions of their transportation assets with interactive maps and performance metrics dashboards.

The TAMC Interactive Map and Dashboards display data for Roads, Bridges, and Culverts conditions along with Finance, Traffic, Maintenance, and Safety data. These data sets can be displayed statewide and regionally by city, village, county, and legislative districts.

The dashboards and maps rely heavily on the reporting and data collection efforts of 617 road-owning agencies across the state.

To view the website, Interactive Map, and Dashboards, visit the TAMC website: www.michigan.gov/TAMC

Sign up for TAMC email notifications: TAMC sign up for notifications (Gov. Delivery Email List Serve)

Website, Interactive Map, Dashboards, and Other Data Efforts (continued)

Since the 2018 TAMC Michigan Local Agency Culvert Inventory Pilot, efforts have been made to create a "Live" Culvert Condition Dashboard and Interactive Map layer that is now completed and readily displays data as it is submitted versus other dashboards that are updated annually. This effort is being further expanded in 2024 to support more technology and Geographic Information System (ArcGIS) tools.
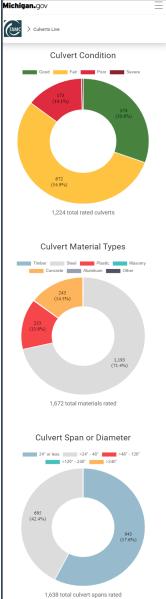
These new Maps and Dashboards give more transparency to the culvert assets that are often overlooked until it's too late, an entire road must be replaced due to a sinkhole, or other major repair effort. Events that are becoming more common with the aging of less visible infrastructure add an incentive for more strides in transparency and collaboration.

Highlights from a recent culvert readiness survey can be found on the Culvert pages in the 2023 Bridge Condition section of this report. Feedback reveals the different levels of development statewide and the increasing importance of these critical transportation assets.

Other data efforts include ongoing Inventory Based Rating (IBR) for gravel road conditions detailed further in the Road Condition section of this report. Results from the first year of a statewide traffic signal inventory reporting effort is also highlighted in the Investment Reporting section.

Report Details

Culvert Condition (1,224 rated out of 1,672 total inventoried culverts)

Rating	Count	Percent of Total
Good	374	30.60%
Fair	672	54.90%
Poor	173	14.10%
Severe	5	0.40%
Unrated	448	N/A

Culvert Material Types (1,672 total materials rated)

Material	Count	Percent of Total
Steel	1193	71.40%
Plastic	233	13.90%
Masonry	2	0.10%
Concrete	243	14.50%
Other	1	0.10%

Culvert Span or Diameter (1,638 total culvert spans rated)

Span	Count	Percent of Total
24" or less	943	57.60%
>24" - 48"	695	42.40%

2023 Road Conditions

City of Bloomfield Hills – Before and After Chip Seal

Paved Federal-Aid Road Condition

One of TAMC's main charges is to determine the condition of paved federal-aid roads, which account for 1/3 of Michigan roads and carry over 95% of the traffic.

Beginning in 2003, MDOT, county, regional, and metropolitan planning agencies joined together to pursue this statewide effort.

Under the direction of TAMC, PASER is the measure chosen to identify the condition of pavements. For over 20 years, PASER has been a consistent, reliable data source.

PASER Condition Ratings		
8-10	GOOD CONDITION	Routine Maintenance Candidate
5-7	FAIR CONDITION	Preventative Maintenance or Rehabilitation Candidate
1-4	POOR CONDITION	Rehabilitation or Reconstruction Candidate

In looking at the trend graph in Figure 3, the 2023 roads conditions almost remained the same with approximately 26% of all paved federal-aid roads being in the Good Condition category. This is a positive sign as road conditions did not deteriorate substantially from the significant gains in 2021.

However, this trend is not expected to continue as paved federal-aid roads are expected to deteriorate, outpacing the potential funding available to maintain the network. See the Pavement Condition Forecast section for more details.
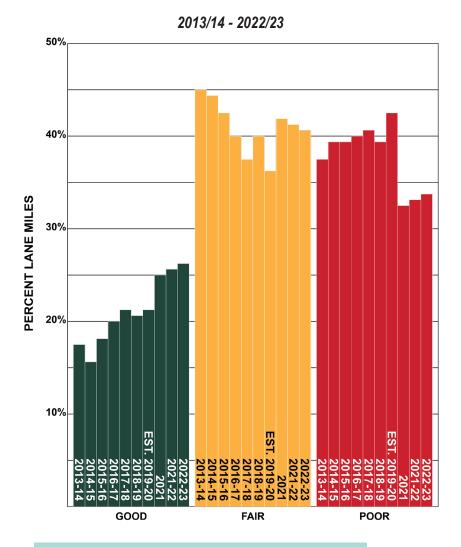

FIGURE 3 – Source: 2013/14 - 2022/23 PASER Data Collection

Due to Covid-19, no data was collected in 2020. Data from 2019-20 is estimated. 100% federal-aid road condition data was collected in 2021.

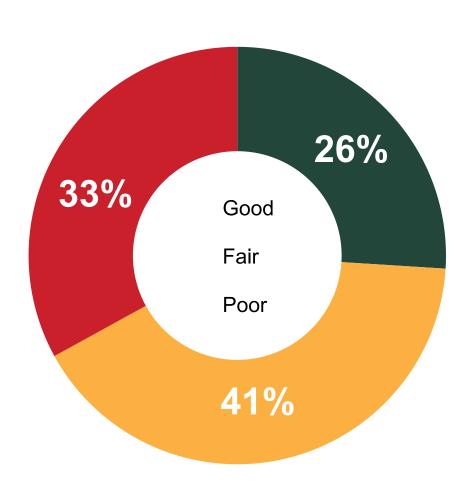# 2023 Paved Federal-Aid Road Condition

FIGURE 5 – Source: 2023 PASER Data Collection

FIGURE 4 – Source: 2023 PASER Data Collection by Lane Miles

Paved Federal-Aid Roads

Road agencies report on the condition of all paved federal-aid roads over the course of two years. Figure 5 is a map showing roads rated in 2022 and 2023. About 68% of the 88,000 lane miles were collected in 2023, and the remaining 32% were used from the 2022 data collection.

To collect PASER data statewide is a coordinated effort made by Regional Planning Agencies (RPA) and Metropolitan Planning Organizations (MPO) working with local agencies in their area. Over 320 road agencies collected 90% or more of their data again in 2023, indicating the value of this inventory effort in data-driven decision making.

Figure 4 shows a composite of these data collection efforts, with 33% of Michigan's lane miles still in poor condition, which has remained steady since 2021.

Pavement Cycle of Life

The pavement cycle of life illustrates the change in paved federal-aid pavement condition over a three year period from 2021-2023.

During this time period, there was a 16.2% increase in the condition of the pavement. Of the total increase, 6.1% of the network improved from poor to good, indicating reconstruction and rehabilitation efforts. A 4.4% improvement of the pavement condition from poor to fair, and 5.8% from fair to good, is indicative of light or heavy capital maintenance projects.

The chart also indicates a total decrease in condition by 21.2% for the same time period. The similar decrease of approximately 9-10% between the rating categories of good to fair and fair to poor is consistent with the regular deterioration rate of untreated roads.

When comparing the 16.2% increase in condition vs. the 21.2% decrease in condition, the overall condition of the network has declined 5%.

In simplified terms, roads are deteriorating faster than the agencies can repair them. Much of this is attributed to increased costs for labor, materials, mobilization, and construction in general. This trend is further examined in the Pavement Condition Forecast.
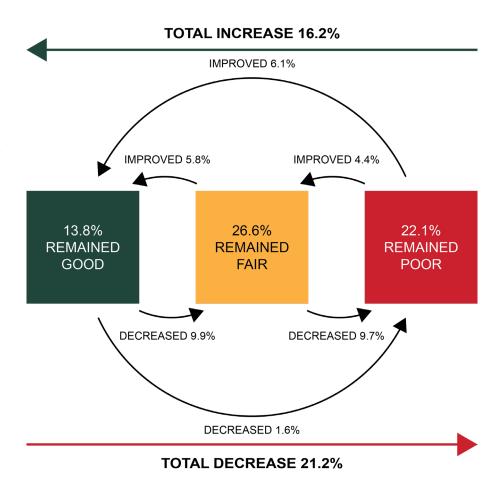
All Paved Federal-Aid Roads 2021-2023

TOTAL INCREASE 16.2%

IMPROVED 6.1%

IMPROVED 5.8%   IMPROVED 4.4%

| 13.8% REMAINED GOOD | 26.6% REMAINED FAIR | 22.1% REMAINED POOR |

DECREASED 9.9%   DECREASED 9.7%

DECREASED 1.6%

TOTAL DECREASE 21.2%

FIGURE 6 – Source: 2021-2023 PASER

Pavement Condition Forecast

Approach for 2025-2035:

The Pavement Condition Forecasting System (PCFS) estimates the future condition of pavements. Examples of criteria that support the PCFS include current pavement condition, road deterioration rates, project costs, expected inflation, fix strategies, and revenues. The forecast also takes into consideration that regions across the state have different challenges when it comes to road repairs and improvements.

Data from the IRT was used to determine varying treatment type costs more accurately across the state. (See Investment Reporting Section). Factors that affect the repairs and improvement costs are:

- Size of the project

- Location

- Impact of frost freeze levels

- Existing soils

- Exposure to extreme heat

- Traffic volume and vehicle classification

- Age and composition of existing base

- Increased cost of materials, mobilization, and labor

In 2023, the path of using two-member rating teams continued to assist agencies in collection efforts as resources remain stretched. Ratings are also compared by quality review teams to ensure a high level of data accuracy.

Using regionally based treatment type costs, individual regional forecasts were developed for 2025-2035. These forecasts were then combined to predict the future condition of pavements across the state.

The statewide pavement forecast indicates a continued decline in the federal-aid roads as seen in Figure 7. By 2035, it is forecast that only 20% of the roads will be in good condition while roads in fair condition will drop to 28%. Over those 10 years, the roads in poor condition will reach 52%.

Significant increased costs for pavement fixes also contribute to less pavement being improved. Without additional and consistent long-term investment, the percentage of roads in poor condition will continue to increase as the increasing construction cost outpaces the ability to fix them.

Forecasts indicate that a decline in the condition of the federal-aid system is inevitable. Looking at past forecasts and current actual ratings, there is confidence in the results of the pavement forecasts. In 2021, it was forecasted that the condition of the system would show the road network at 25% good, 40% fair, and 35% poor. Condition data collected in 2023 shows the forecast developed in 2021 was not far off from the measured 26% good, 41% fair, and 33% poor. This analysis shows the forecasts are valuable, and good asset management strategies used by road agencies may be slowing down the rate of deterioration. Analysis in future years will determine forecast accuracy and the effect of asset management strategies.
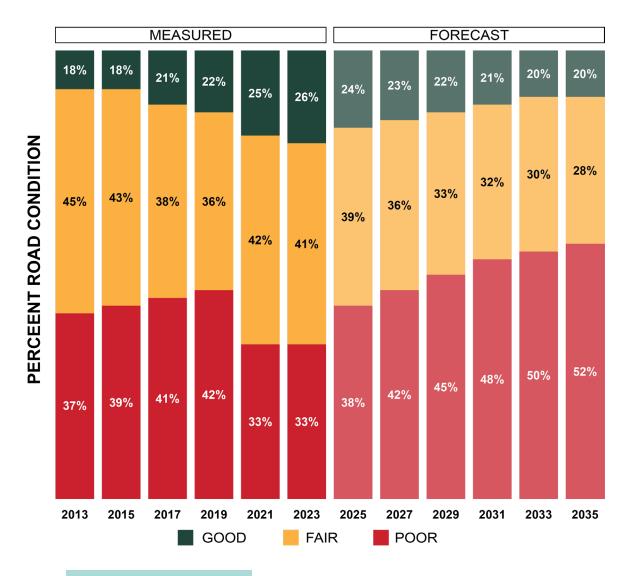
Pavement Condition Forecast

2023-2035

FIGURE 7 – Source: 2023 TAMC

2023 Non-Federal-Aid Road Condition

FIGURE 8 – Source: 2023 PASER Data

Non-Federal-Aid Roads

There are over 165,000 lane miles of both paved and unpaved NFA roads in Michigan. The federal government classifies these roads as being "local roads." Each year, many local road agencies choose to rate some or all of their NFA roads. The TAMC is working to promote and provide resources for the collection of NFA data, as a full data set does not currently exist. To provide a more accurate look at the condition of the NFA system and to stay consistent with FA data analysis, two years' worth of NFA data was analyzed.

Approximately 41,667 NFA lane miles were rated in 2022 and 2023. Figure 8 shows a map of these ratings collected by local road agencies. Of these roads, 47% were found to be in poor condition, as displayed in Figure 9, which is 2% more than from 2021 and 2022.

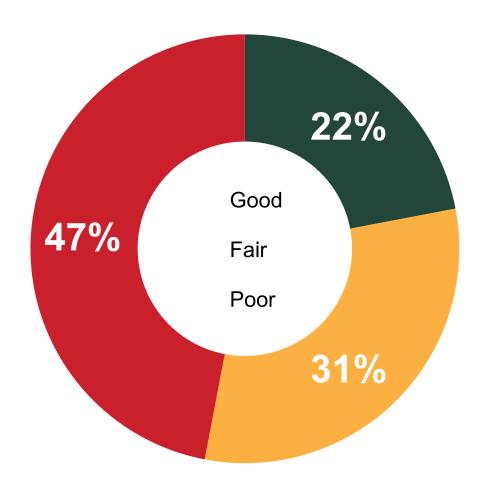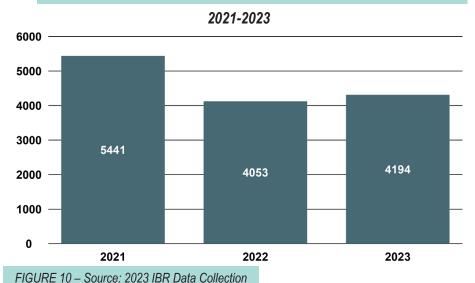Local road agencies use ratings on both FA and NFA roads to help manage their road network.

22%
47%
31%

Good
Fair
Poor

FIGURE 9 – Source: 2023 PASER Data Collection by Lane Miles

TRANSPORTATION ASSET MANAGEMENT ROADS & BRIDGES ANNUAL REPORT

Gravel Roads and Inventory Based Rating (IBR)

In 2018, gravel roads IBR was introduced. This is a similar effort to PASER on paved roads with supported training by TAMC based on a 0-9 rating scale. See example IBR numbers on page 17. The IBR rating system provides added tools to manage this important and often missed element of Michigan's road infrastructure.

Figure 10 shows the total lane miles of IBR ratings collected on gravel roads from 2021-2023. (This chart was revised from the 2022 report to show both Federal Aid and NFA gravel roads.) At this time, the total number of gravel road lane miles is unknown. The TAMC continues to promote the collection of inventory and condition data throughout the state to develop a more accurate database.

Some road agencies make the decision to return a paved road back to a gravel road. This is often due to costs but also as an asset management strategy that helps balance the total road network and improve the level of service expectations.

To learn more about IBR and gravel road condition ratings:

https://ctt.mtu.edu/inventory-based- rating-system

https://ctt.mtu.edu/sites/default/files/ resources/ibr-system/ibrmanual.pdf

http://www.ctt.mtu.edu/sites/ctt/files/ flyers/2023paseribr.pdf

Note: Teams collecting PASER ratings for paved roads can also attend training to collect IBR for gravel roads.

Miles of Gravel Roads Rated Per Year (IBR)

2021-2023

Year	Miles
2021	5441
2022	4053
2023	4194

FIGURE 10 – Source: 2023 IBR Data Collection

Examples of IBR Numbers on Gravel Roads

9 IBR Number 9

Surface Width: Good
Drainage Adequacy: Fair
Structural Adequacy: Good

8 IBR Number 8

Surface Width: Fair
Drainage Adequacy: Good
Structural Adequacy: Good

5 IBR Number 5

Surface Width: Good
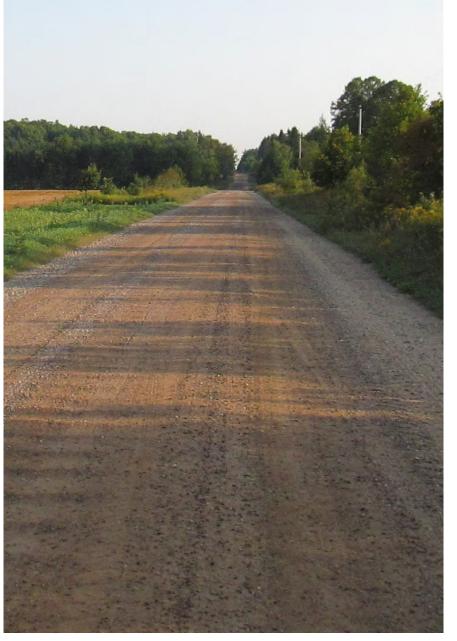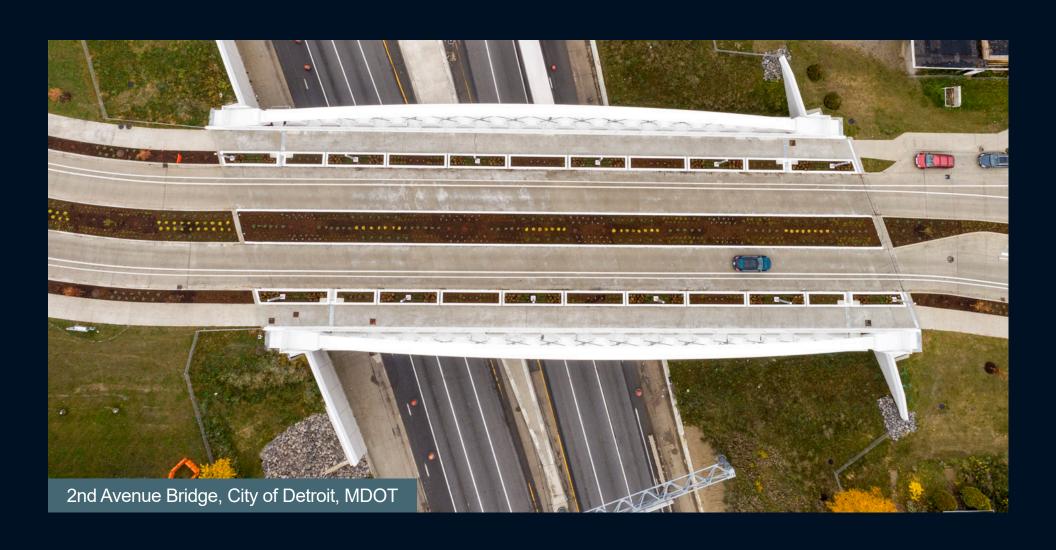Drainage Adequacy: Poor
Structural Adequacy: Poor

5 IBR Number 5

Surface Width: Poor
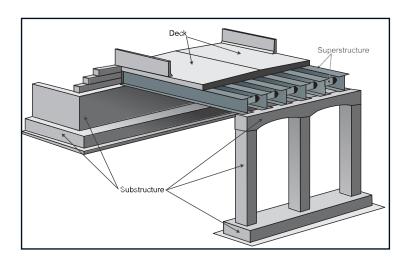Drainage Adequacy: Good
Structural Adequacy: Good

TRANSPORTATION ASSET MANAGEMENT ROADS & BRIDGES ANNUAL REPORT

Keweenaw County, Michigan

2023 Bridge Conditions

2nd Avenue Bridge, City of Detroit, MDOT

Statewide Bridge Conditions

The National Bridge Inspection Standards (NBIS) define a bridge as a structure carrying traffic with a span greater than 20 feet. Condition ratings are based on a 0-9 scale and assigned for each culvert or the deck, superstructure, and substructure of each bridge. These ratings are recorded in the National Bridge Inventory (NBI) database.

FIGURE 11 – Source: 2014-2023 Michigan Bridge Inventory

As shown in Figure 11, in 2023, over 11.2% of NBI structures in Michigan are in poor/severe condition. This means that 1,264 bridges need major rehabilitation or are candidates for replacement.

Since 2014, there has been a steady decline of bridges in good condition and a rise of bridges in fair condition. These trends indicate the continued statewide deterioration of bridges and the significant need for increased investment.

Comparing Bridge Conditions
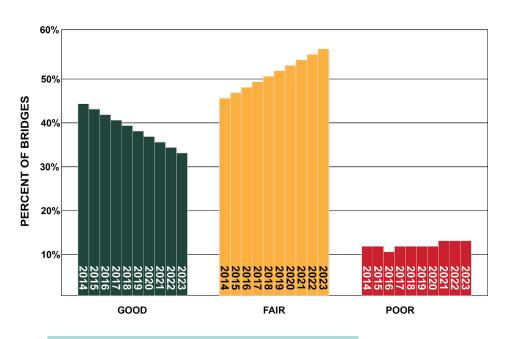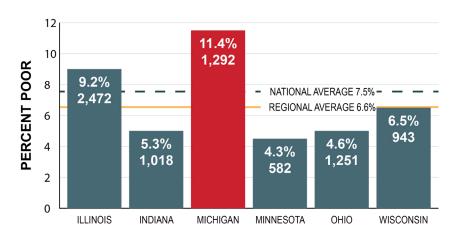
Michigan lags behind its neighboring Great Lakes States in terms of bridge condition. As seen in Figure 12, Michigan has the highest percentage of poor bridges in the Great Lakes Region and also has significantly more poor bridges than the national average. More concerning, when measuring the bridges in severe condition or those requiring additional monitoring, immediate action, or at risk of closure, Michigan has over double the percentage of bridges with NBI ratings of three or less than the regional and national average. Bridge counts have been added below the percent condition ratings.

NBI Condition Ratings		
7-9	GOOD CONDITION	Routine Maintenance Candidate
5-6	FAIR CONDITION	Preventative Maintenance or Rehabilitation Candidate
4	POOR CONDITION	Major Rehabilitation or Reconstruction Candidate
2-3	SERIOUS OR CRITICAL CONDITION	Emergency repair, high-priority major rehabilitation, or replacement candidate. Unless closely monitored, it may be necessary to close until corrective action can be taken.
0-1	SERIOUS OR CRITICAL CONDITION	Major Rehabilitation or Replacement Candidate (road is closed to traffic)

2023 Percent Poor Bridges

NBI 4 or Less

ILLINOIS 9.2% 2,472 — INDIANA 5.3% 1,018 — MICHIGAN 11.4% 1,292 — MINNESOTA 4.3% 582 — OHIO 4.6% 1,251 — WISCONSIN 6.5% 943

NATIONAL AVERAGE 7.5%
REGIONAL AVERAGE 6.6%

2023 Percent Severe Bridges

NBI 3 or Less

ILLINOIS 2.9% 771 — INDIANA 0.8 163 — MICHIGAN 3.7% 419 — MINNESOTA 0.8% 104 — OHIO 0.9% 242 — WISCONSIN 1.2% 171

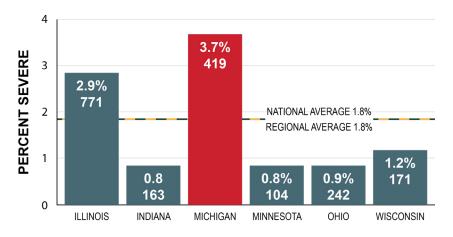NATIONAL AVERAGE 1.8%
REGIONAL AVERAGE 1.8%

FIGURE 12 – Source: 2023 Michigan Bridge Inventory

2023 MDOT Bridge Conditions

Unlike roads, all bridges are considered federal-aid eligible. Figure 13 shows that of the 4,505 owned by MDOT, nearly 7% of bridges are in poor or severe condition, and 70% are in fair condition. This large population of bridges in fair condition represents the previous investments in preservation. Until recently, MDOT has been able to maintain the number of bridges in fair condition before they reach the poor category while increasing the number of bridges in good and fair condition. An aging infrastructure and rising costs, along with not enough existing revenue or new revenue to maintain our aging bridges, have reversed some of that progress.

Maintaining or improving the bridges rated in good or fair condition is imperative to prevent the number of bridges in the poor category from increasing.
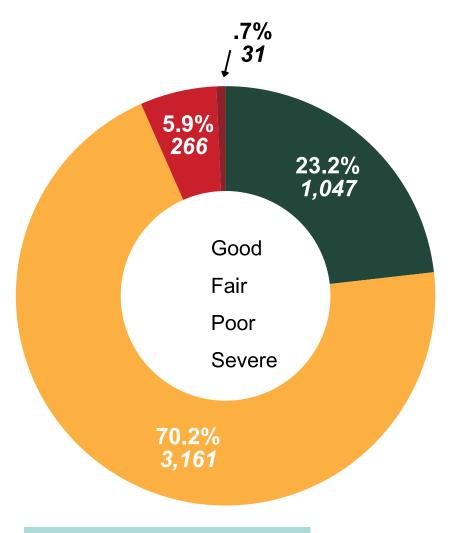
.7%
31

5.9%
266

23.2%
1,047

Good

Fair

Poor

Severe

70.2%
3,161

FIGURE 13 – Source: 2023 Michigan Bridge Inventory

2023 Local Road Agency Bridge Conditions

Good
Fair
Poor
Severe

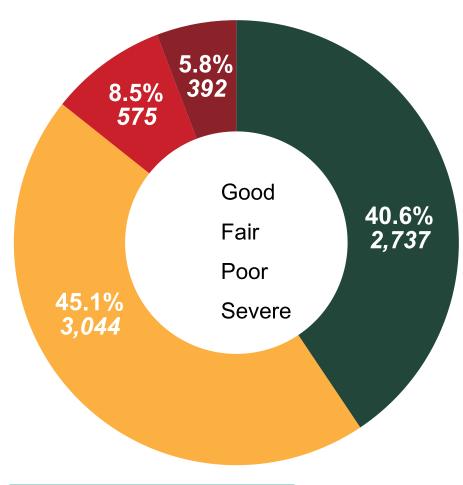40.6%
2,737

45.1%
3,044

8.5%
575

5.8%
392

FIGURE 14 – Source: 2023 National Bridge Inventory

There are 6,748 local road agency bridges. Figure 14 shows that local road agencies continue to manage both a larger percentage of good bridges and a larger percentage of poor and severe bridges than MDOT. Many local road agencies are working to embrace preservation strategies but are prevented by the overwhelming need of the bridges in the worst conditions.

A bridge in poor condition is a candidate for major rehabilitation or replacement. When the bridge no longer has the strength to bear the loads for which it was designed, the bridge must be posted for lower loads in order to maintain safety.

A bridge in severe condition often needs expensive emergency repairs, temporary supports, or shoulder closures. Ultimately, the inability to obtain funding will result in a safety risk to the public, and the bridge will have to be closed. At the end of 2023, 67 local road agency bridges were closed due to conditions. Even with the increase in bridge funding, this number is close to the 69 bridges that were closed in 2022.

Changes in Bridge Conditions

Figure 15 illustrates the changes in the condition of bridges throughout Michigan over a four-year period from 2020-2023.
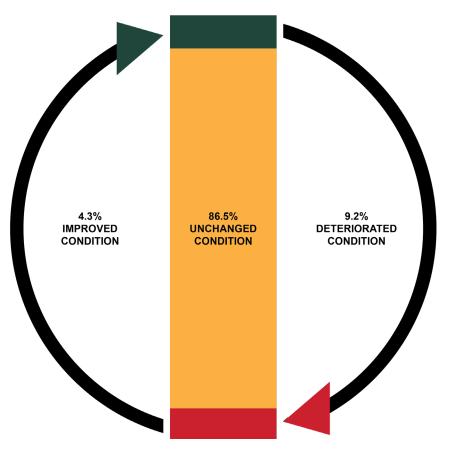
During this period of time, there was a 4.3% increase and a 9.2% decrease in the condition of bridges statewide. The bridge system experienced an overall decline of 4.9%.

Bridges are deteriorating faster than road agencies can repair or replace them. Much of this is attributed to increased costs for labor, materials, mobilization, and construction in general. This trend is further examined in the Bridge Condition Forecast section.

All Roadway Bridges

2020-2023

4.3% IMPROVED CONDITION

86.5% UNCHANGED CONDITION

9.2% DETERIORATED CONDITION

Bridges Decline 4.9%

FIGURE 15 – Source: 2020-2023 Michigan Bridge Inventory

Bridge Condition Forecast

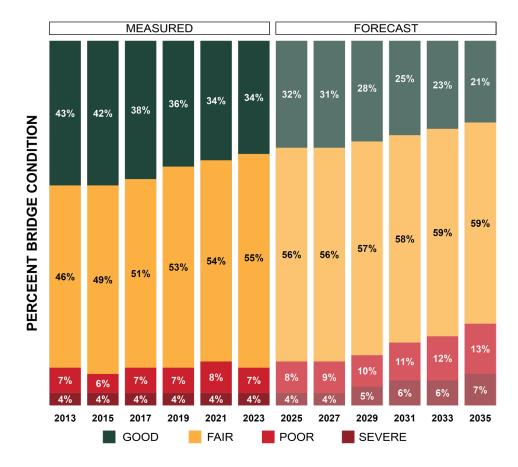## All Roadway Bridges
2025-2035

FIGURE 16 – Source: 2023 TAMC

Working from current NBI bridge condition information, bridge deterioration rate, project costs, expected inflation, and fixed strategies, the Bridge Condition Forecasting System (BCFS) estimates the future condition of bridges. Figure 16 indicates that the combined overall bridge condition of all Michigan's bridges is expected to continue to decline.

This analysis includes the bridge funding designated in the Infrastructure Investment Jobs Act (IIJA) for both MDOT and local agencies as well as other bridge program funds.

Comparing historical forecast information, the actual measured condition of bridges closely follows the predicted condition in past years. The measured condition in 2023 matches poor and severe as predicted. The measured condition of good and fair bridges varies by 2%. This analysis shows there is confidence in bridge condition forecasts as measured results are comparable.

This forecast for the severe condition category predicts an increase in future years, with 20% of all bridges to be in the poor or severe category by 2035. This indicates that without additional investment in bridge programs, an increased number of bridges will be at high risk for emergency repairs and closures over the next 10 years.

Local Bridge Analysis (NBI only)

The overall system continues to be at risk, as seen by the forecasted increase in fair, poor, and severe structures. Local road agencies are responsible for more severe and poor bridges, 14.2%, than MDOT, with 6.6%. Currently, there is a dedicated $50 million in funding annually for local road agency bridges. Due to increased costs for transportation infrastructure materials and labor, this amount will not help maintain or improve the condition of local road agency bridges.

Figure 17 illustrates how existing and increased funding could influence the number of bridges in good and fair categories. With fewer bridges rated good and fair, there is an increase in poor and severe, leading to

safety concerns and closures. Indicated in red is how the percentage of bridges in good and fair condition will decline rapidly if funding remains the same. In 2023, 67 bridges were closed, at this rate of decline, more bridges will be closed in the future.

To maintain existing condition levels at 85% good and fair, a funding increase to $125M annually is needed, indicated in yellow. To improve overall bridge system conditions and reduce the number of bridges rated severe and poor, approximately $237M in annual funding is needed, as indicated in green. An increase in bridge improvement funding is necessary to prevent the deterioration of the system and imminent closures.
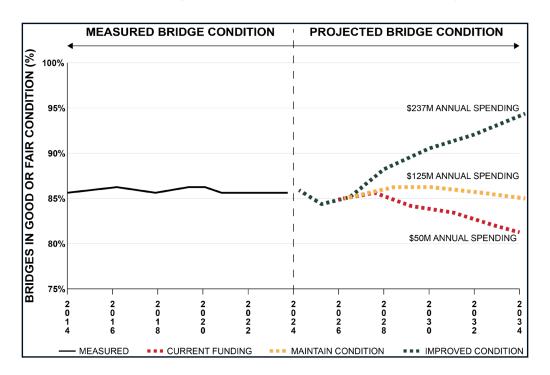

FIGURE 17 – Source: MDOT

Culverts

The collection of culvert inventory and condition data provides a foundation for successful asset management planning and practice. A good asset management strategy requires having the location and condition of culverts to prevent failure and avoid injury or loss of life for travelers. Culvert asset management also ensures rivers, streams, and drains remain free-flowing to protect ecosystem health and make smart investments in transportation infrastructure.

The TAMC, with guiding support from the Bridge Committee, continues to promote and develop direction for culvert inventory and condition data collection.

FIGURE 18 – Source: TAMC Interactive Map

Culvert Asset Management Resources

The Policy for Collection of Culvert Inventory and Condition Data was developed and adopted by the TAMC in 2022 and updated in the winter of 2024. The policy includes recommended information on training, reimbursable expenses, and the responsibilities of regional planning agencies and metropolitan planning organizations. It also includes guidance on data collection, including how it should be collected and the frequency of collection.

The Center for Training & Technology offers a biannual Culvert Condition Assessment Webinar. This session is developed in line with the Michigan Non-NBI Culvert Structure Inspection guide. Attendance at the webinar grew by over 130 participants from 2022 to 2023, a positive trend showing increasing interest in the effort.
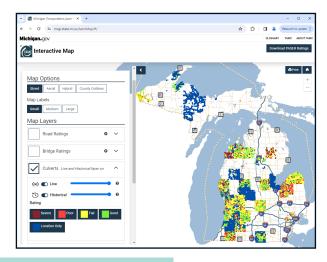
In addition to training resources, the CTT also conducts studies such as the Culvert Asset Management Best Practices report as mentioned in the TAMC Highlights & Accomplishments section. The results of these studies assist the TAMC and associated committees to develop and provide statewide guidance.

As of 2023, submitting culvert data through Roadsoft became an option for local agencies. Once submitted, the data is added to the TAMC dashboards and Interactive Map. The TAMC is developing alternatives for culvert data submission that can expedite data submission from sources outside of Roadsoft, which will then assist efforts in completing a data set in the future. Presently, the TAMC has data on approximately 54,000 culverts, and there is no firm estimate of the total number of culverts in the state. Figure 18 is a display of culvert data submitted since 2018.
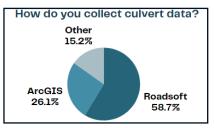
Culverts (continued)

The TAMC Bridge Committee, to learn about local agencies and their culvert data collection efforts, distributed a culvert survey during the winter of 2024 to all local road agencies in Michigan. Based on the responses, the Bridge Committee has a better understanding of the state of culvert asset management practice throughout Michigan.

Many respondents indicated they had not collected culvert data or had not attended the Culvert Condition Assessment Webinar offered by CTT. Although the responses from the survey indicate a small effort toward culvert data collection, 68% of respondents indicated they are interested in learning more. Of the agencies that indicated they have collected culvert and inventory data, many indicated that the data is valuable and assists with determining budgets for capital improvement plans and risk assessment plans, and is critical for successful systemic planning of maintenance and replacement of these assets. The value of being proactive in replacing culverts before they fail was indicated as a primary reason for collecting data.

With less active participation but growing interest, further outreach and training opportunities will be necessary to encourage more agencies to consider taking on the data collection effort and lead them through the process.

As 48% of agencies responded they have collected data, TAMC records were showing less data had been submitted. This may indicate agencies didn't know they could submit through Roadsoft or did not collect the data in Roadsoft. Alternatively, of the 52% not collecting data, what was the reasoning behind it?
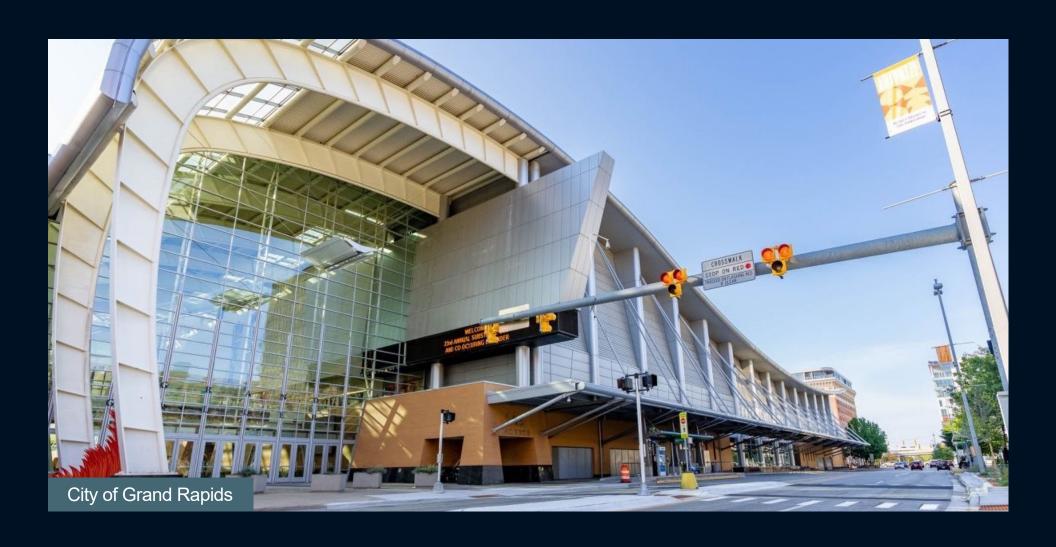

The responses provided the foundation for future Bridge Committee efforts. The TAMC is developing alternative submittal processes for data collected outside of Roadsoft, as well as how to promote culvert asset data collection for agencies that lack resources or interest in the effort.

Jackson County, Michigan

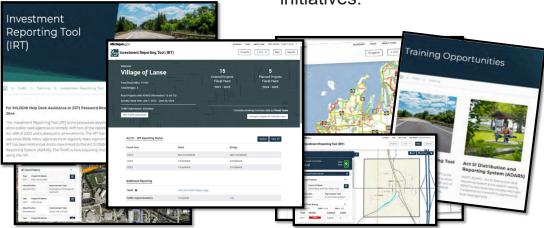# Investment Reporting

City of Grand Rapids

Investment Reporting Tool (IRT)

The IRT is tool free to local road agencies that was developed to allow all Michigan road owning agencies to satisfy the requirements of Act 51. The basic requirement is to report road and bridge projects they have completed and projects that are planned in the next three years. The IRT integrates with other software programs such as Roadsoft, Act 51 Distribution and Reporting System (ADARS), and JobNet to assist users in saving time and improving data quality and efficiency.

A road agency can also use the IRT as a tool to manage its road and bridge assets with customized maps, data exports, and a variety of summary reports. The interactive map in the IRT can display project information for presentations and public outreach.

Other IRT features include:

- Submission and review status of TAMPs.

- Project reporting integration with Roadsoft software.

- PASER submission and review for planning agencies.

- Entering Traffic Signal Inventory information.

- Options to import major planned projects.

- Submission of local agency pavement warranties.

- Free training with online webinars, Help Desk, and YouTube videos.

What follows in this section are more details on the new traffic signal inventory survey, asset management plan study results, and road and bridge project summaries. This information is used in road and bridge condition forecasting efforts, statewide investment strategies, and initiatives.

Road Project Details

Michigan has over 122,000 miles of public roads. These roads are owned collectively by 617 agencies consisting of 83 counties, 533 cities/villages, and MDOT.

Although Michigan has one of the most complex road networks, it also offers opportunities for collaboration and cost-saving through partnerships, open communication, and solid asset management planning. The dig once "motto" is the underlying theme in trying to balance multiple infrastructure efforts.

The IRT Road Projects are reported as these four classifications that assist in analysis and forecasting efforts:

- Reconstruction

- Rehabilitation

- Heavy Capital Preventive Maintenance

- Light Capital Preventive Maintenance

As seen in Figure 19, 2021-2023 road projects submitted to the IRT total roughly $4.93B* of total investment over the last three years. (Note: IRT projects do not include newly developed roads.)

Year	Projects Reported	Total Cost	Total Lane Miles
2021	5,437	$1.62 Billion	18,975
2022	5,426	$1.66 Billion	17,779
2023	2,256*	$1.65 Billion*	7,115*
Total	**13,119***	**$4.93 Billion***	**43,869***

FIGURE 19 – Source: 2021-2023 TAMC

* IRT reporting is based on each agency's Fiscal Year to sync with Act 51 financial reporting. This correlation is significant as many counties and cities have an annual 2023 reporting deadline of May or June, which is after this report is released. A more complete 2023 IRT data set will be available in the fall of 2024.

Bridge Project Details

Bridge IRT Project Summaries		
Year	Projects Reported	Total Cost
2021	308	$401 Million
2022	265	$200 Million
2023	122*	$146 Million*
Total	**862***	**$747 Million***

FIGURE 20 – Source: 2021-2023 TAMC

Of Michigan's 617 road agencies, 352 own and maintain bridges. Approximately half of Michigan's 11,000 bridges are owned by local road agencies and the other half by MDOT. Bridge asset management considerations for individual road owning agencies can greatly impact planning and project considerations.

Bridges can vary substantially in their length, deck area, and other factors. Replacing a bridge can often significantly impact the local economy as well as emergency services, regardless of agency size.

As seen in Figure 20, investment in bridge projects ranged from $146M to $401M with roughly $747M reported from 2021-2023. More costly bridge replacements contributed to the sharp increase in total cost for 2021.

Note: The Rouge River Bridge, Zilwaukee Bridge, and other large bridges are not included in statewide totals since the high cost of this type of project would significantly shift totals and averages.

Traffic Signal Inventory Survey

Following the progress with inventory and condition data of roads, TAMC is now looking at traffic signals as another key transportation asset. This effort started in 2018 and involved multiple discussions with stakeholders across the state, as traffic signals are owned and maintained in vastly different ways. One county may maintain signals for a city, or a different city may maintain the signals for several counties and villages in its nearby area, or even a consulting firm may maintain signals for one or more agencies. Some cities and villages may not own any signals, with the primary traffic light being owned and maintained by a county or MDOT.

A survey of traffic signalized intersections was initiated in 2023 using the (IRT). Of 617 road-owning agencies statewide, 283 responded to the survey. As seen in Figure 21, a total of 170 agencies indicated that they do not own signalized intersections, while 113 agencies indicated they do own these types of assets. The survey also indicated an annual cost to operate and maintain these signals was approximately $22,600,000. This does not include planned upgrades or new investments.

Type of Road Owning Agency (Number of Responses)	Number of Agencies Owning Signalized Intersection		Total Number Signalized Intersections Assets Owned	% Total of Number Owned	Total Annual Maintenance Cost
	Don't own	Own			
Village (127)	112	35	76	1%	$77,570
City (118)	74	90	1879	27%	$77,393,761
County (37)	19	21	1930	27%	$8,219,733
MDOT (1)	N/A	1	3144	45%	$7,600,000
Total based on 283 responses	205	147	7029	100%	$23,291,063

FIGURE 21 – Source: IRT Traffic Survey Responses (Revised to show Number of Agencies Don't Own vs Own)

Traffic Signal Inventory Survey (continued)

Breakdown by Number of Signals Owned	Number of Agencies	Total Signals	% of Total Reported Signals	Total Annual Maintenance Cost	% of Total Cost
Agencies that own 1-5 signals	86	162	2%	$341,162	1.5%
Agencies that own 6-20	31	336	5%	$601,111	2.6%
Agencies that own 21-100	21	951	14%	$2,777,546	11.9%
Agencies that own 101-600	6	1067	15%	$5,444,212	23.4%
Agencies that own 601+	3	4513	64%	$14,127,032	60.6%
Total based on 283 responses	**147**	**7029**	**100%**	**$23,291,063.00**	**100%**

FIGURE 22 – Source: IRT Traffic Signals Maintenance by Number Owned

* Includes MDOT

Figure 22 shows a significant difference in how this type of asset is maintained versus roads or bridges. Due often to specialized equipment or available work crews, many road agencies or utilities help maintain signals for their neighbors or statewide partnerships with MDOT. Of the total response, three agencies have ownership of over 2/3 of the total signals and over 60% of the total cost reported.
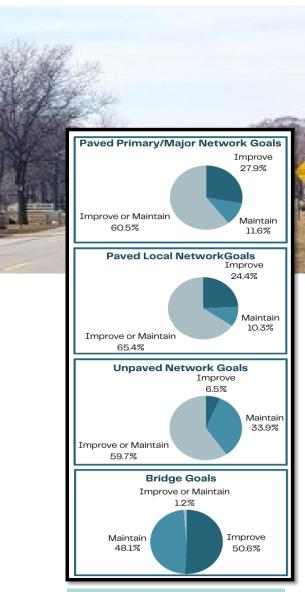
Evaluating Local Agency TAMPs

Paved Primary/Major Network Goals
- Improve 27.9%
- Maintain 11.6%
- Improve or Maintain 60.5%

Paved Local Network Goals
- Improve 24.4%
- Maintain 10.3%
- Improve or Maintain 65.4%

Unpaved Network Goals
- Improve 6.5%
- Maintain 33.9%
- Improve or Maintain 59.7%

Bridge Goals
- Improve or Maintain 1.2%
- Maintain 48.1%
- Improve 50.6%

FIGURE 23 – Source: 2023 Local Road Asset Management State of Practice Project Report

The Center for Technology & Training at MTU conducted an evaluation of Michigan's Local Agency TAMPs to examine all compliant local agency TAMPs that were submitted between 2020 and 2022. The purpose of this was to compile aggregate statistics of the plans, identify trends and concerns, and provide recommendations on how the process, tools, or training could be improved.

Some recommendations provided in the study include:

- Updates to the template for consistency and ease of development.

- New tools in Roadsoft that provide a network needs assessment to assist in forecasting future conditions.

- Improve TAMP training to assist in areas where there were commonly asked questions.

In addition to these recommendations, aggregate statistics that were compiled included information on how local road agencies were reporting, what they were reporting, when they planned to update their plans, and what content they included in the required sections of the TAMP Compliance Plan. Information on roads and bridge asset inventory and condition data TAMP sections were analyzed. However, the study also evaluated what was reported in the coordination with other entities, risk of failure analysis, culvert, and signals sections.

More in-depth evaluation examined the local road agency goals and strategies for improving or maintaining conditions and the level of investment needed. Most agencies set performance goals aimed to maintain or improve the current condition levels. Goals were set for bridges and each road network that local road agencies were required to report on Paved Primary/Major, Paved Local, and Unpaved.

Evaluating Local Agency TAMPs (continued)

After identifying goals to improve and/or maintain the primary, local, and unpaved network, each local road agency is required to report their estimated expenditures each year for the next three years. Once the goals and estimated expenditures are reported, agencies then calculate the additional funds needed each year to meet their goals. The average annual funding gap was estimated at $1.07 billion in needs for the local road agencies that submitted TAMPS.

Figures 24 and 25 show the estimated spending as reported in the TAMPs and the additional funds needed to meet established goals.

Estimating statewide transportation funding needs is a continuous effort that has been studied by many organizations. A recent estimate from the County Road Association in their 2023 County Road Investment Plan identified that the necessary level of investment needed on the county only road and bridge system to meet performance goals is $2.4 billion.

The process of calculating this figure can be done in a variety of ways using data from diverse sources, ultimately the outcome of these studies is consistent: additional funding is needed.
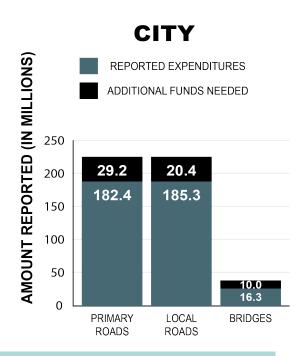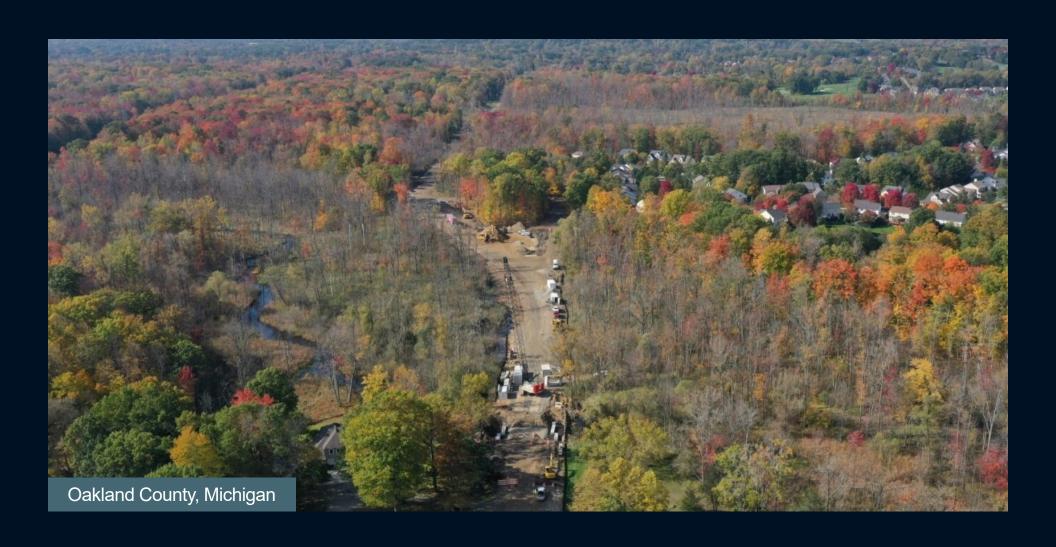
COUNTY

FIGURE 24 – Source: 2023 Local Road Asset Management State of Practice Project Report

CITY

FIGURE 25 – Source: 2023 Local Road Asset Management State of Practice Project Report

Looking into 2024

Oakland County, Michigan

Looking into 2024 (continued)

Integrated Infrastructure Conference

In 2024, the TAMC, along with the (MIC) and the (WAMC), will be hosting their first joint conference, "Creating a Culture of Asset Management for a Brighter Future." It will be a day-and-a-half event held at Grand Valley State University's L.V. Eberhard Center on August 13 and 14. The event will offer a fresh format with valuable resources for agencies and asset management professionals throughout the state.

NFA Data Collection Reimbursement

Using carryover funds from fiscal year 2023, the TAMC initiated a one-time reimbursement program to assist local agencies in collecting condition data on their NFA network. This program provides much-needed assistance to local agencies to help fill in data gaps on their network. Local agencies that received reimbursement through this program for their data collection include those that have no data or have not collected data in the past three years.

Additional Guidance

As asset management practice throughout the state grows in popularity, the TAMC continues to address needs and improve support to local, regional, and statewide partners. Transportation Asset Management does not end with pavement. Future efforts will include the promotion and guidance of asset management strategies for culverts and signals. Other endeavors to gauge advanced technology for data collection will keep Michigan a nationwide leader in Asset Management.
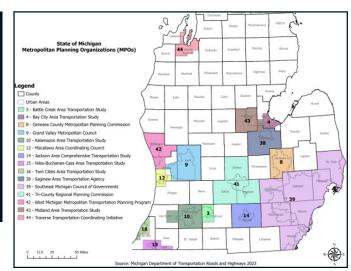
Regions at Work

Regional Planning Agencies (RPA) and Metropolitan Planning Organizations (MPO) throughout the state have the responsibility to manage and coordinate inventory and data collection and asset management efforts in their regions. Every year, the TAMC develops a unified work program outlining work items and eligible work items. In 2024, the TAMC is making efforts to enhance collaboration with the regional partners on activities. By providing guidance and developing congruent annual timelines, the TAMC hopes to enhance the asset management program and strengthen partnerships statewide.

In 2023, a new MPO, Traverse Transportation Coordinating Initiative, was established. This new MPO is the result of 2020 census data and the rapid growth in the Grand Traverse region. Figure 26 shows the updated map of MPOs in Michigan.

Did you know... Michigan has 14 Regional Planning Agencies and 15 Metropolitan Planning Organizations?

FIGURE 26

Acronyms and Abbreviations

All references to Act 51 in this document refer to Public Act 51 of 1951, as amended.

ADARS: Act 51 Distribution and Reporting System

APWA: American Public Works Association

BCFS: Bridge Condition Forecasting System

CPM: Capital Preventive Maintenance

CRA: County Road Association (of Michigan)

CSS: Center for Shared Solutions (DTMB)

CTT: Center for Training and Technology (MTU)

DTMB: Department of Technology, Management and Budget

EGLE: Department of Environment, Great Lakes, and Energy

FHWA: Federal Highway Administration

FA: Federal Aid

FAST: Fixing America's Surface Transportation Act

IBR: Inventory Based Rating (Gravel Roads)

IIJA: Infrastructure Investment and Jobs Act

IRT: Investment Reporting Tool

MAC: Michigan Association of Counties

MAR: Michigan Association of Regions

MDNR: Michigan Department of Natural Resources

MDOT: Michigan Department of Transportation

MIC: Michigan Infrastructure Council

MML: Michigan Municipal League

MPO: Metropolitan Planning Organization

MTA: Michigan Townships Association

MTPA: Michigan Transportation Planning Association

MTU: Michigan Technological University

NBI: National Bridge Inventory

NBIS: National Bridge Inspection Standards

NFA: Non-Federal Aid

NFC: National Functional Classification

NHS: National Highway System

PASER: Pavement Surface Evaluation and Rating

RPA: Regional Planning Agency

STIP: State Transportation Improvement Program

TAMC: Transportation Asset Management Council

TAMP: Transportation Asset Management Plan

WAMC: Water Asset Management Council

TAMC was created by Public Act (PA) 499 of 2002.

To act as a resource for independent objective data on the condition of Michigan's roads and bridges and as a resource for implementing the concepts of asset management.

"All public roads in Michigan will be managed using the principles of asset management."

– Public Act (PA) 499 of 2002 created the Michigan TAMC

Michigan Transportation Asset Management Council

Transportation Asset Management Council (TAMC) (michigan.gov)