# MICHIGAN'S
ROADS & BRIDGES 2015
ANNUAL REPORT

Michigan
Transportation Asset
Management Council

TAMC

2014-2015 Road Condition
Percent Lane Miles

16%
39%
45%

2014-2015 Bridge Condition
Percent Lane Miles

42%
10%
48%

GOOD FAIR POOR

Table of Contents

ACRONYMS AND ABREVIATIONS USED FREQUENTLY IN THIS REPORT

FHWA; Federal Highway Administration
FAST: Fixing America's Surface Transportation Act
Map-21: Moving Ahead For Progress In The 21st Century
MDOT: Michigan Department Of Transportation
MPO: Metropolitan Planning Organization
NBI: National Bridge Inventory
NFC: National Functional Classification
NHS: National Highway System
PASER: Pavement Surface Evaluation And Rating
**RPO: Regional Planning Organization**
STP: State Transportation Program
TAMC: Transportation Asset Management Council

Any reference to Act 51 in this document refers to Public Act 51 of 1951

EXECUTIVE SUMMARY

Last year's annual report from the Transportation Asset Management Council (TAMC) carried a grim tone. Pavement conditions on federal-aid eligible roads were in decline all over Michigan and finding additional money to reverse that trend did not look like a viable option. The forecast for future roads conditions, based on expected revenues in the spring of last year looked like this.

2015 Pavement Condition Forecast
Paved Federal-Aid Roads Only – Before Additional Funds
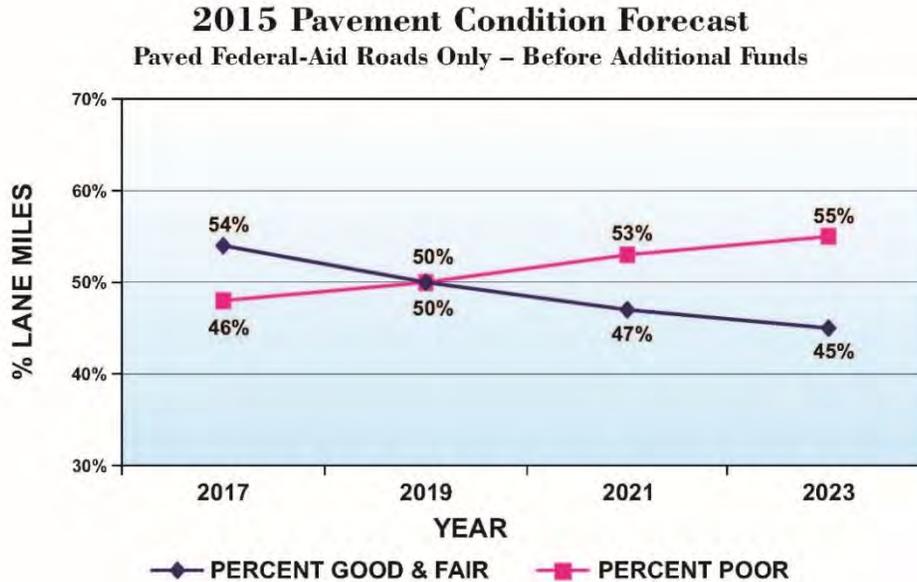
In November of 2015, the Michigan legislature passed a transportation funding package that will generate approximately $453 million in additional funds in fiscal year 2017. This rises to $1.2 billion per year in new transportation funding in fiscal year 2021 and then continues to increase with the rate of inflation as calculated by the Consumer Price Index from 2022 onward.

Then, in December, 2015, Congress passed reauthorization legislation for the Federal Highway Administration (FHWA) which is expected to result in an approximate five percent increase in federal transportation dollars coming to Michigan. Taken together, these influxes of new funds are not sufficient to solve Michigan's transportation problems, but they are adequate to put us on a slow and steady path to improving the overall quality of Michigan's federal-aid eligible roads and bridges. However, since the first of the new funds do not begin to arrive until January 2017, we expect to see a continued deterioration of the condition of Michigan's federal-aid eligible roads, albeit at a slower pace than before, for another couple of years before the trajectory turns toward gradual improvement in 2019. Because the fuel taxes and registration fees will be indexed to inflation after 2022, something the legislature has never done before, it is expected that the gradual improvement of Michigan's federal-aid eligible roads will be sustainable far longer than if the indexing had not been included.
As a result of these new funds, the current forecast for changes in the pavement condition of the paved federal-aid eligible roads in Michigan now looks like this:

2017 - 2023 Pavement Condition Forecast
Paved Federal-Aid Roads Only – Including General Funds
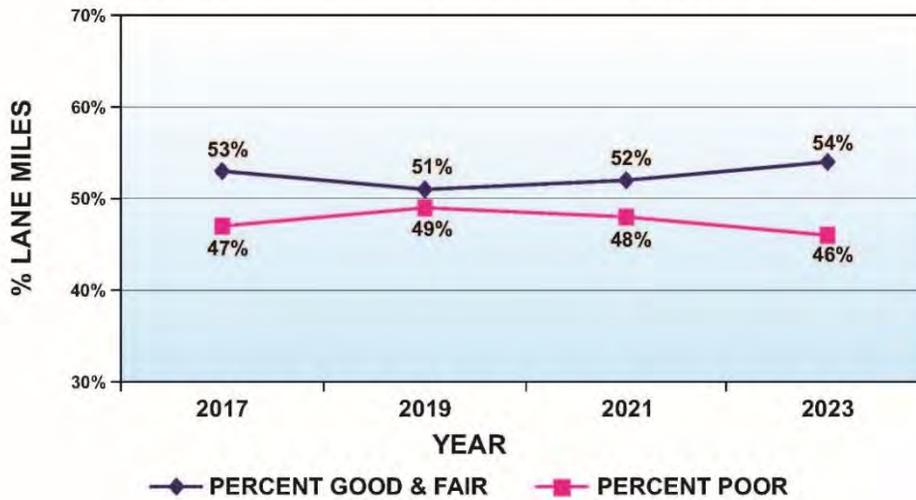
However, half of the new funds included in the Michigan funding package, and all of the new federal funds approved will be coming from the general funds of the State of Michigan and the United States. Unlike the fuel taxes and registration fees which, once adopted, are dedicated to transportation purposes, the allocation of general funds to transportation is subject to the annual appropriations process. Michigan is currently facing several challenges outside of transportation that will be competing for those future general fund appropriations. Because of Michigan's term limits, most of the legislators who passed the Michigan funding package will not be in office when the time comes to appropriate those promised dollars to transportation purposes.

2017 - 2023 Pavement Condition Forecast
Paved Federal-Aid Roads Only – No General Funds
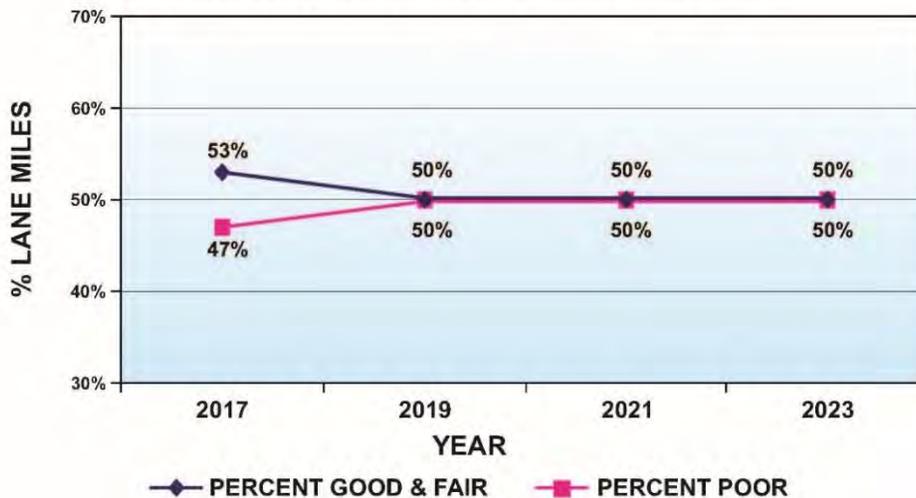
The graph above shows the forecast for changes in the condition of Michigan roads if the $600 million in general funds promised in the Michigan transportation funding package are not appropriated.

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An analysis of bridge conditions in Michigan shows that bridge owners in the state are continuing to "hold their own" despite rising costs and revenue challenges. From 2004 to 2012, the overall network of bridges in the state saw a slight but steady improvement in overall condition. However, from 2012 to 2015 the improvement in bridge condition has stagnated. This can be attributed to:

1. Progress being made initially in reducing the number of structurally deficient bridges under state jurisdiction.
2. More local agencies are implementing preventive maintenance "mix of fixes" strategies on local bridge systems.
3. Rising costs and an increasing inventory of fair bridges creates a preservation need that exceeds available funding.

### 2016 - 2025 Bridge Condition Forecast System
Trunkline and Local Agency Bridges
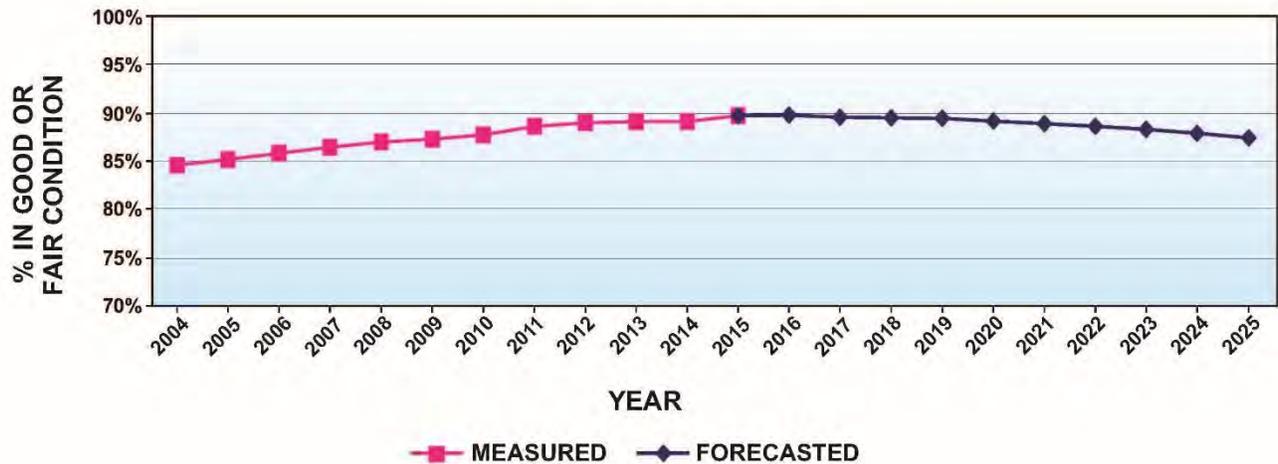
Working from current bridge condition information from the National Bridge Inventory (NBI), the Bridge Condition Forecasting System (BCFS) estimates future condition of MDOT and local bridges using bridge deterioration rates, project costs, expected inflation, and planned fix strategies. The figure below indicates the combined overall bridge condition of all the state's bridges (both on state trunklines and on local agency roads, i.e. counties, cities, and villages) is expected to decline after 2015. By 2025, nearly half of the progress made toward improving bridge conditions since 2004 could be lost. In addition, the condition and forecast data shows the local bridge program could materially benefit from more road agencies actively adopting good capital preventive maintenance strategies.

While additional road funding was approved at both the state and federal level, no new funds were earmarked specifically for bridge programs. Therefore this forecast assumes no additional spending on bridges beyond those funds already designated for that purpose. If the various state road agencies begin programming some of the expected new funds to bridge projects, that will be reflected in future forecasts.

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STATE TRANSPORTATION FUNDING

On November 10, 2015 Governor Snyder signed a package of legislative transportation funding bills (Michigan Revenue Package) designed to generate $1.2 billion in new Michigan Transportation Fund (MTF) revenues by 2021. Approximately half of this total will come from increases in fuel taxes ($400 million) and vehicle registration fees ($200 million) starting in 2017. Then, beginning in 2019, increasing amounts of general fund dollars, reaching $600 million in 2021, will be transferred to the MTF to be further distributed to the various road agencies in the state. Lastly, the fuel taxes will be indexed to inflation, using the Consumer Price Index (CPI), beginning January 1, 2022.

IMPLICATIONS FOR MICHIGAN'S ROADS

The first table shows on a year by year basis how much additional revenue is expected to be generated by the increases in fuel taxes and registration fees, and the amount of future transfers from the State's General Fund that were included in the Michigan Revenue Package.

Table 1
Estimated Additional MTF Revenue
Michigan Revenue Package signed into law on November 10, 2015 (in $millions)

Fiscal Year:	2015	2016	2017	2018	2019	2020	2021	2022	2023
Gasoline Tax	0	0	230	313	311	310	308	314	321
Diesel-fuel Tax	0	0	76	93	94	95	96	98	99
Vehicle Registrations	0	0	147	189	193	197	201	205	210
Income Tax; Gen. Fund	0	400	0	0	150	325	600	600	600
Total Additional Funds	0	400	453	595	748	927	1,205	1,217	1,230

The next table shows how the new fuel taxes and registration fees are expected to be distributed through the existing Act 51 formula. Under the terms of the legislation, the future transfers from the general fund beginning in 2019 are also distributed to road agencies via the existing Act 51 formula, however they skip the part of the formula that generates funds for transit agencies. This alteration of the Act 51 formula only applies to general fund transfers beginning in 2019.

Table 2
Estimated Distribution of Additional MTF Revenue
Michigan Revenue Package signed into law on November 10, 2015 (in $millions)

Fiscal Year:	2015	2016	2017	2018	2019	2020	2021	2022	2023
State Trunkline Fund (MDOT)	0	215	161	211	270	340	449	452	456
Comprehensive Transportation Fund (Transit Agencies)	0	25	44	58	58	59	59	62	63
83 Counties	0	102	154	204	263	333	442	452	456
533 Cities and Villages	0	57	86	114	147	186	246	252	254
Total Additional Funds*	0	399	445	587	738	918	1,196	1,218	1,229

* A small portion of the new fuel tax revenues are diverted to a rail grade crossing account and another small portion is diverted to a recreational improvement account (for off road vehicle activities). These two diversions explain the differences in the totals between the new funds generated table, and the new funds distributed table

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The following table shows how the totals of the existing transportation revenues (2015) combined with the additional funds generated from the Michigan Revenue Package will be distributed to the various agencies during the next several years.

Table 3
Estimated Total MTF Distributions And General Fund Appropriations

Fiscal Year:	2015	2016	2017	2018	2019	2020	2021	2022	2023
State Trunkline Fund (MDOT)	673	883	829	879	939	1,008	1,117	1,120	1,124
Comprehensive Transportation Fund (Transit Agencies)	167	169	213	227	228	228	228	231	232
83 Counties	646	671	800	849	909	979	1,087	1,097	1,102
533 Cities and Villages	368	425	454	482	515	554	615	620	623
Total Act 51 Funds:	1,854	2,148	2,296	2,437	2,591	2,769	3,047	3,068	3,081

The Michigan Revenue Package includes:
a 20% increase in *ad valorem* cars and elected-GVW truck registrations, starting Jan. 1 2017;
new flat fees for hybrid and electric vehicles;
a 25.9-cent/gallon gasoline tax starting on Jan. 1, 2017, inflating with CPI after 2021;
a 26.3-cent/gallon Diesel-fuel tax starting on Jan. 1, 2017, inflating with CPI after 2021;
a transfer of income-tax revenue, starting with $150 million in 2019 and increasing to $600 million by 2021, for roads agencies only

FEDERAL HIGHWAY FUNDING

On December 4, 2015, President Obama signed the Fixing America's Surface Transportation (FAST) Act which provides funding for transportation programs through 2020. This act includes $70 billion in new funding to be transferred from the federal general fund into the Highway Trust Fund through 2020. Michigan expects to see an increase of approximately five percent in federal transportation dollars over the next 5 years. In addition, the FAST Act continues the requirement for a statewide Transportation Asset Management Plan that was originally part of the Moving Ahead for Progress in the 21st Century (MAP-21) Act that preceded FAST.

FORECASTS OF EXPECTED CHANGES WITH NEW FUNDS

Prior to the passage of the Michigan Revenue Package and the FAST Act, the forecast showed a continued slow deterioration on Michigan's federal-aid eligible roads. This is what last year's forecast looked like with no expectation of additional funding becoming available:

2015 Pavement Condition Forecast
Paved Federal-Aid Roads Only – Before Additional Funds

YEAR	2017	2019	2021	2023
PERCENT GOOD & FAIR	54%	50%	47%	45%
PERCENT POOR	46%	50%	53%	55%
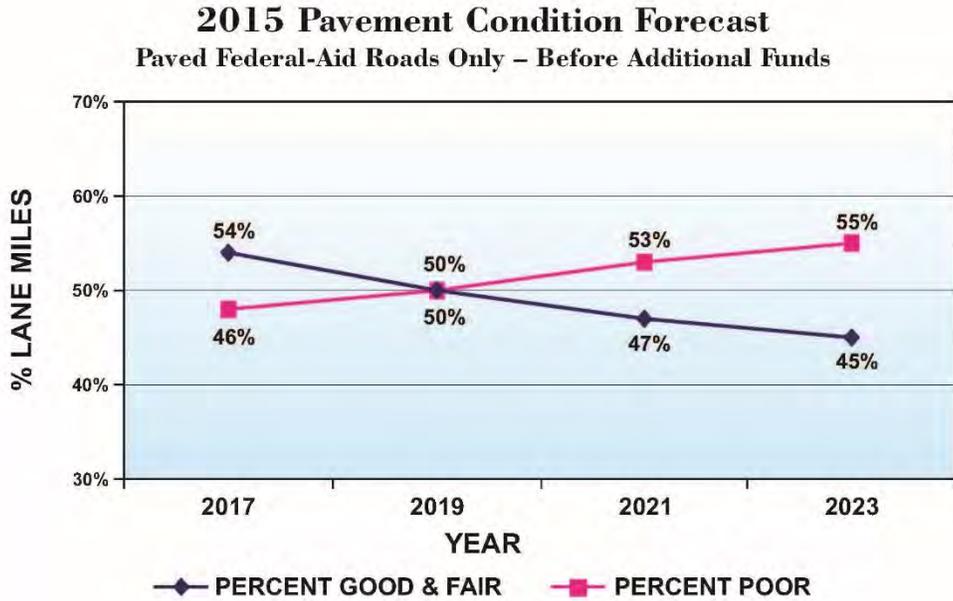
However, the revised forecast shows that with the new funds, the decline in the overall condition of Michigan's federal-aid roads is expected to be arrested in 2019, with a gradual improvement in the overall roadway conditions after that date.

2017 - 2023 Pavement Condition Forecast
Paved Federal-Aid Roads Only – Including General Funds

YEAR	2017	2019	2021	2023
PERCENT GOOD & FAIR	53%	51%	52%	54%
PERCENT POOR	47%	49%	48%	46%
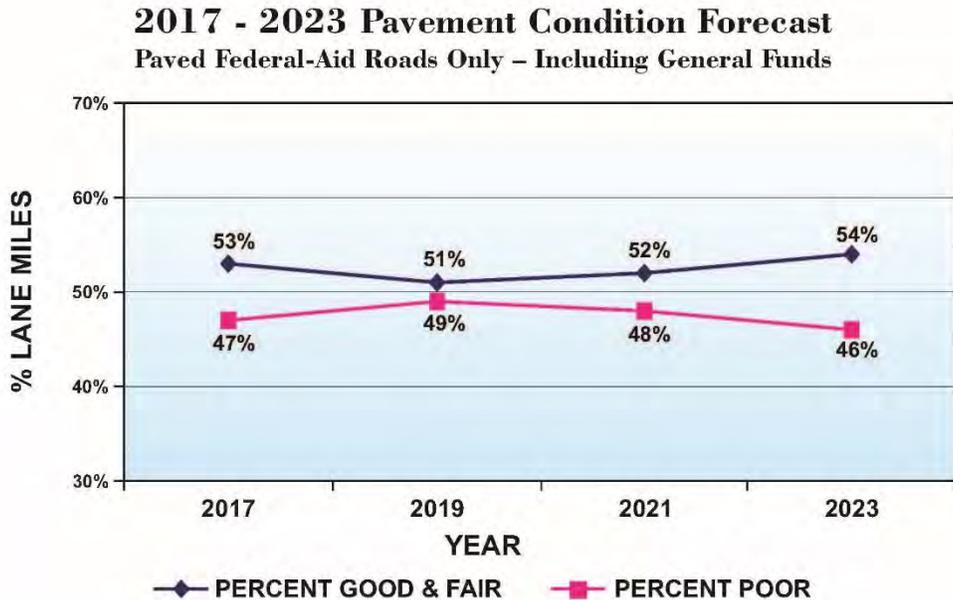
ROAD DATA REVIEW

The TAMC was created by statute in 2002 and began collecting reliable annual PASER data in 2006. Now that there are several years' worth of reliable road condition data available, TAMC has the ability to begin to analyze that data in conjunction with other infrastructure related data that has been collected over the years. However, drawing definitive conclusions may require additional data collection efforts in the future. Further analysis is necessary across all 617 transportation agencies.

The following three graphs show the overall changes in the condition of Michigan's federal aid eligible roads over the past eight years separated into the three major groupings of road ownership (green is "good" condition, yellow is "fair" condition and red is "poor" condition).
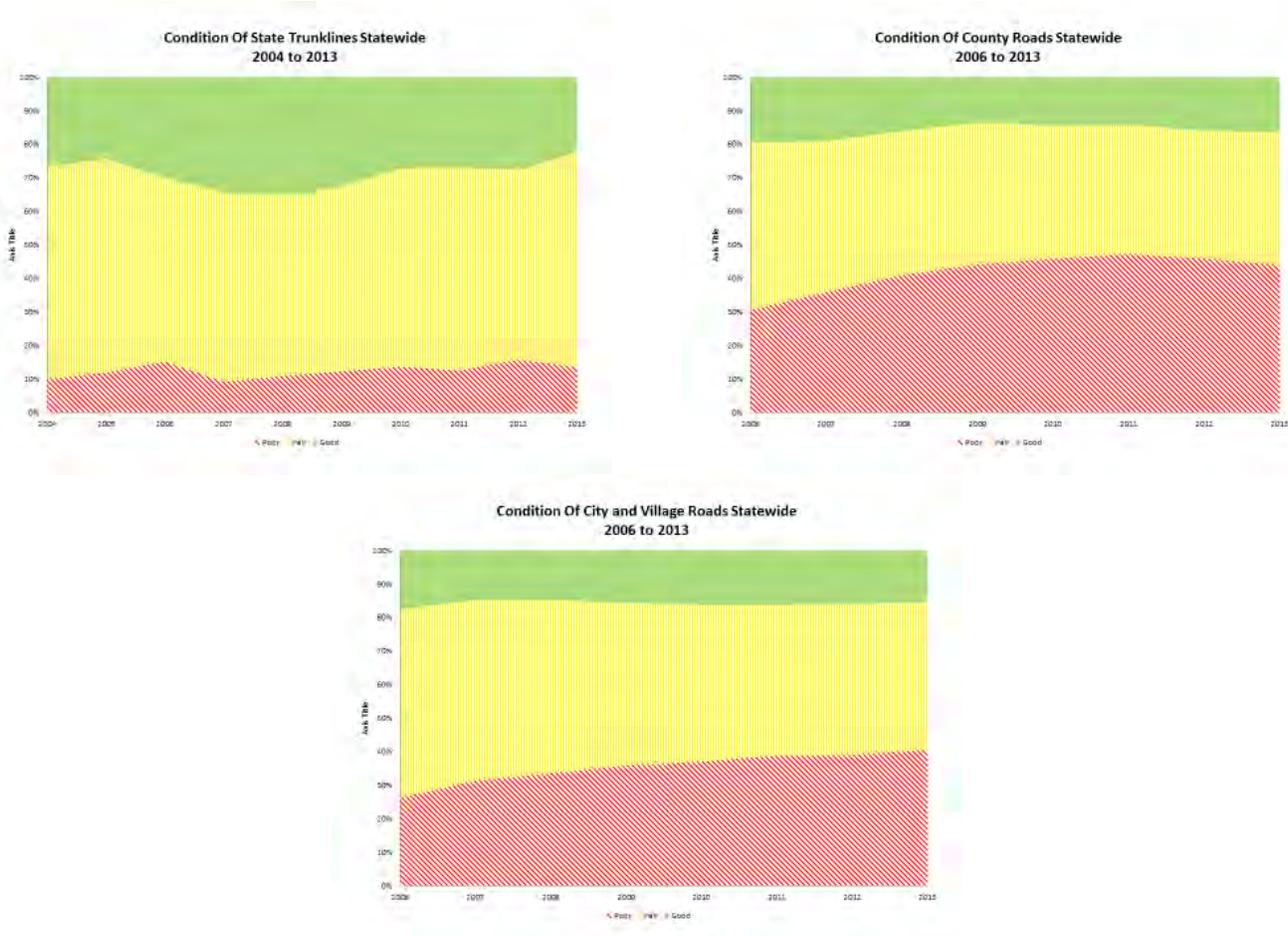

These statewide graphs correspond with the annual condition graphs TAMC has been displaying in its annual report over the past eight years. MDOT has been practicing asset management principles since the 1990s. Many of the county, city, and village road agencies have only been introduced to asset management practices since the creation of TAMC in 2002.

The adoption of the asset management approach to maintaining Michigan's roads has allowed the 617 road agencies in the state to extend the time that roads are considered to be in "good" or "fair" condition much longer than under previous management approaches, and slowed the deterioration of roads into the "poor" category.

***Michigan's Annual PASER Condition Assessment – A Team Effort***: Every year since 2004 TAMC partners with each of Michigan's twenty-one Regional and Metropolitan Planning Organizations (RPO/MPO) to coordinate the annual PASER condition assessment of the paved federal-aid road system. A team of three raters composed of a representative from MDOT, RPO/MPO, and a local agency (County, City/Village) embark on an effort to rate at least 50 percent of the paved federal-aid road system each year. Over 100 teams of trained raters assess the condition of 84,000 lane miles of paved federal-aid eligible roads once every two years. Individuals must attend PASER training each year before being allowed to rate the roads.

Quality Assurance and Quality Control (QA/QC)

With over 100 teams of trained raters assessing the condition of roads statewide annually, data quality is of utmost importance to TAMC. Accurate PASER ratings depend on the judgment of the raters. Every year raters are required to attend PASER training and review the rating criteria. Various types of pavement distress are shown and there is a discussion on how various types of distress contribute to the appropriate rating for each road segment. The goal is uniformity: all rating teams should assign the same rating when observing a given segment of road. In order to ensure this uniformity, a qualified transportation technician observes and independently rates over 2,000 road segments scattered throughout the state. These ratings—known as the QC ratings-- are later compared to the ratings reported by the teams. The analysis shows that over 90 percent of the ratings are either identical or within two rating points of each other. The average difference in ratings was just ¼ of a rating point.

2015 Paved Federal-Aid Roads Only
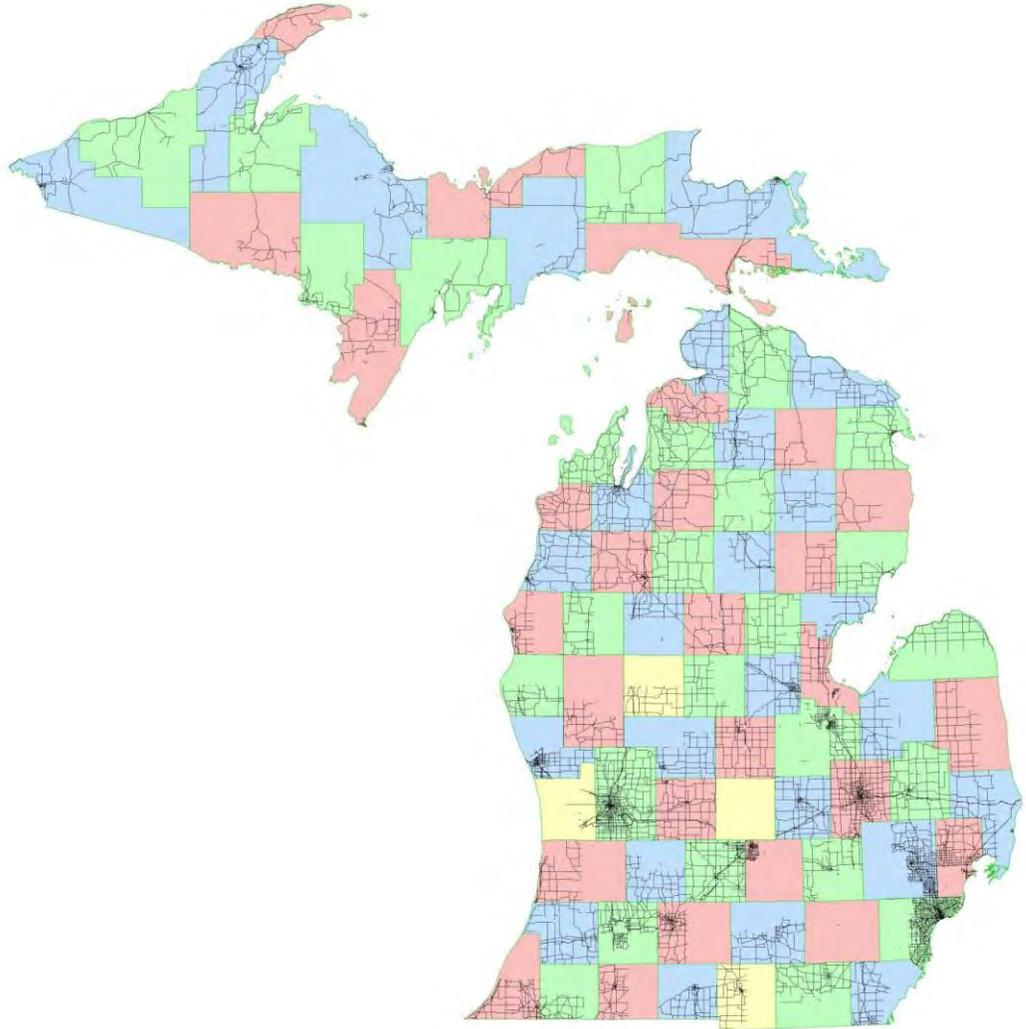
Federal-Aid Roads

From 2004-2007, TAMC required 100 percent of all paved federal-aid roads be rated each year. Beginning in 2008, in response to budgetary and staffing concerns expressed by local road agencies, TAMC began to require that only 50 percent (by county) of the paved federal-aid eligible roads be rated each year, equating to 100 percent coverage of the statewide system every other year. In 2015, 61 percent of federal-aid roads were rated. In order to provide a complete, accurate report on road conditions, both 2014 and 2015 PASER ratings were used in the analysis of road condition. 2014 ratings were used for the 39 percent of roads that were not rated in 2015.

2014 - 2015 Pavement Condition
Percent Lane Miles


| GOOD | FAIR | POOR |
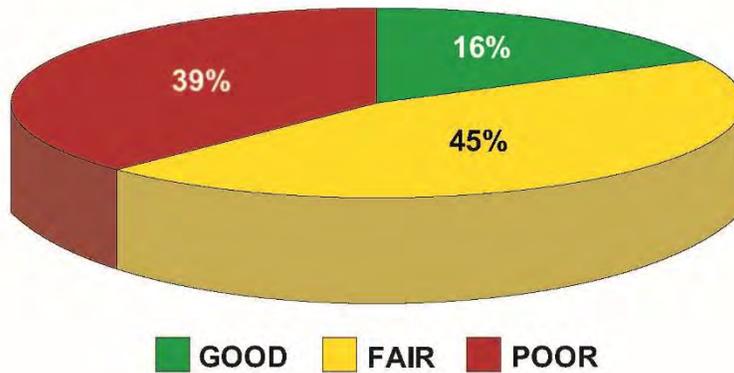
Source: 2015 PASER Data Collection
Figure 3

Figure 3, above, summarizes the results of the 2015 PASER rating, 39 percent were rated in "poor" condition, 45 percent were rated in "fair" condition, and 16 percent were rated in "good" condition. For reporting purposes, TAMC uses the following scale: road segments rated 8, 9, or 10 are categorized as "good"; segments rated between 5 and 7 are classified as "fair"; and segments rated 4 or less are considered to be in "poor" condition.

2014 - 2015 PASER Ratings
### Percent Lane Miles

| GOOD | FAIR | POOR |
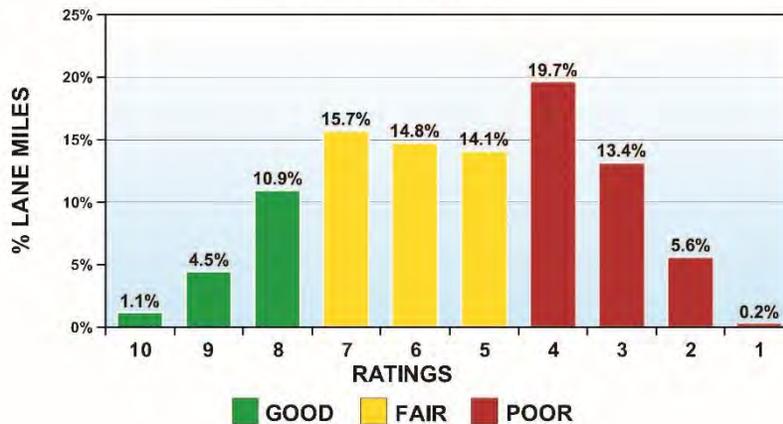
Source: 2015 PASER Data Collection
Figure 4

Figure 4, above, shows the breakdown of the 2015 pavement condition by percentage of lane miles in each of the ten individual PASER rating units.
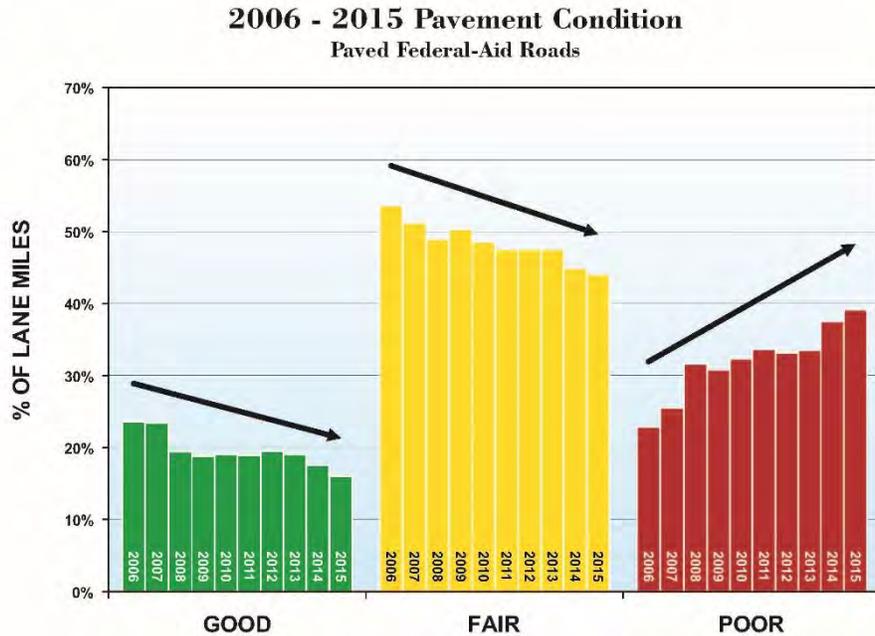
Source: 2006 – 2015 PASER Data Collection
Figure 5

Figure 5 above shows that in 2006, 23 percent of lane miles were identified as being in "poor" condition. By 2015, that number has increased to 39 percent. In 2006, nearly 77 percent of the federal-aid system could be considered in "good" or "fair" condition. By 2015, that figure fell to 61 percent. Clearly, the overall condition of the federal-aid system is getting significantly worse with more miles in poor condition than in good condition. The cost of returning a road that requires structural improvement i.e. from poor condition to good condition is four to five times greater than the cost of returning a road requiring Capital Preventive Maintenance (CPM) i.e. from fair condition to good condition. Allowing more roads to reach poor condition will dramatically increase the costs of repairing Michigan's road network.

PAVEMENT CONDITION FORECASTS

In November, the Michigan legislature passed a transportation funding package that is expected to generate approximately $453 million in additional funds in fiscal year 2017 rising to $1.2 billion per year in new transportation funding in fiscal year 2021 and then continuing to increase with the rate of inflation as calculated by the CPI from 2022 onward.

Then, in December, Congress passed reauthorization legislation for the Federal Highway Administration which is expected to result in an approximate five percent increase in federal transportation dollars coming to Michigan. Taken together, these influxes of new funds are not sufficient to "solve" Michigan's transportation problems, but they are adequate to put us on a slow and steady path to improving the overall quality of Michigan's federal-aid eligible roads and bridges.

Because the fuel taxes and registration fees will be indexed to inflation after 2022, something the legislature has never done before, , it is expected that the gradual improvement of Michigan's federal-aid eligible roads will be sustainable far longer than if the indexing had not been included.
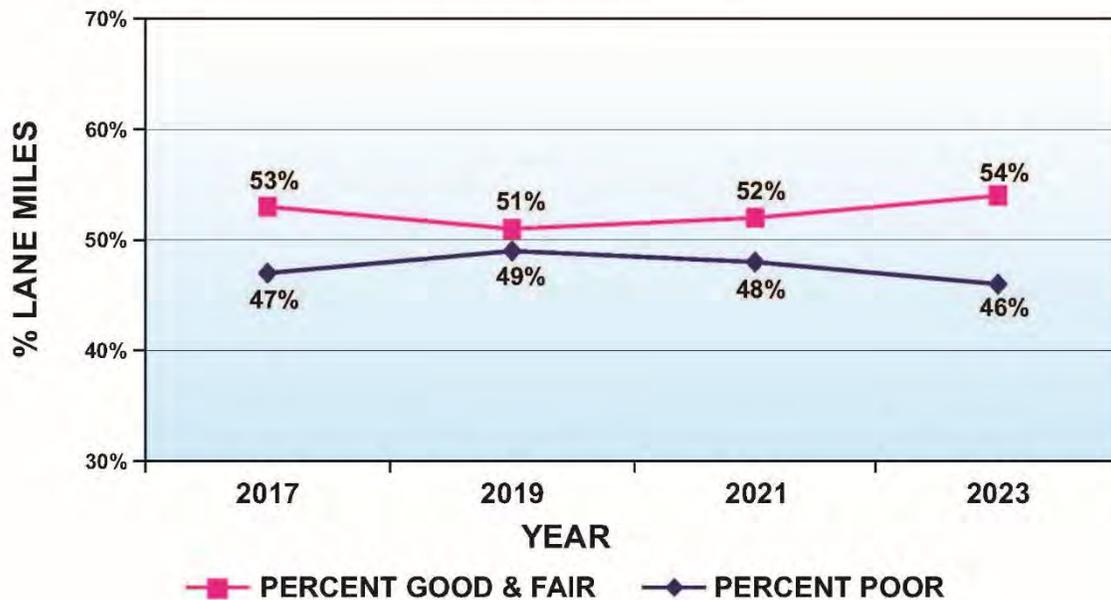

Figure 6

Figure 6, above, shows that at the expected funding levels over the next several years, the condition of paved federal-aid roads will continue on a downward trend over the next 2 years before enough of the new funding has entered the system to reverse that trend. Overall pavement conditions are expected to begin gradually improving starting in about 2020.

PAVEMENT CYCLE OF LIFE

Pavements deteriorate through a cycle starting from good condition, to fair condition and ultimately to poor condition. This doesn't happen overnight, but age along a recognizable cycle. There are many places along the cycle where performing some capital preventive maintenance at a relatively minimal cost (when compared to the cost of reconstruction) can prolong the life of the pavement in a good or fair condition for a number of additional years. If appropriate investments can be made at or before the pavement has reached the threshold of poor condition, it is usually significantly less expensive and can extend the useful life of the asset in good or fair condition well beyond the "normally expected" lifespan of that asset. Unfortunately, Figure 7 below indicates we are not making those investments as often as we should. The Pavement Cycle of Life charts the life of pavement on federal-aid system in the State of Michigan over the last four-years and shows that almost 24.5 percent of Michigan's roads have deteriorated; 10.1 percent of the roads went from good to fair, 13.2 percent went from fair to poor, and approximately 1 percent slid all the way from good to poor. In that same four year period, only 13.4 percent of the roads were improved; 4.5 percent went from fair to good, 4.7 percent went from poor to fair and 4.2 percent went from poor to good. ***Overall, almost 25 percent of the lane miles have deteriorated and less than 14 percent have improved. We continue to lose ground each year!***
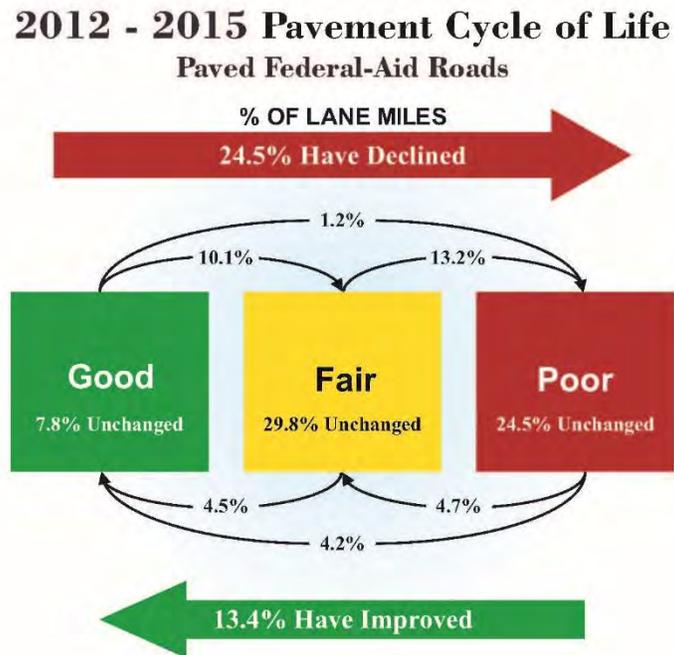
Source: 2012 – 2015 PASER Data Collection
Figure 7

National Highway System (NHS)

FAST is the first federal law in over a decade that provides long-term highway authorization and funding certainty and was signed into law by President Obama on December 4, 2015. The FAST Act authorizes $305 billion from 2016 through 2020 The FAST Act maintains the focus on safety and keeps intact the established structure of the various highway-related programs managed by FHWA while continuing efforts to streamline project delivery and for the first time provide a dedicated source of federal funds for freight related projects, Under the FAST Act, each state is required to develop a risk-based asset management plan for the National Highway System (NHS) to improve or preserve the condition of the assets and the performance of the system.

2014 - 2015 National Highway System
Percent Lane Miles

| GOOD | FAIR | POOR |
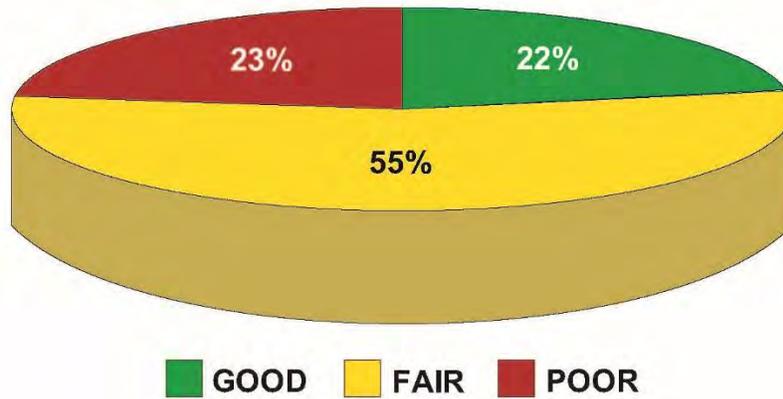
Source: 2014 - 2015 PASER Data Collection
Figure 8

Similar to the pavement ratings for federal-aid roads, the ratings for NHS roads are reported in lane miles. Figure 8 above reveals that in the 2015 ratings, 23 percent are in poor condition, 55 percent are in fair condition, and 22 percent are in good condition.

National Functional Classification (NFC)

Since its inception, the Council's primary focus has been on how the transportation system functions. The federal-aid system is subdivided into four major NFC groups, Principal Arterials, Freeways (a subset of Principal Arterials), Minor Arterials and Collectors.
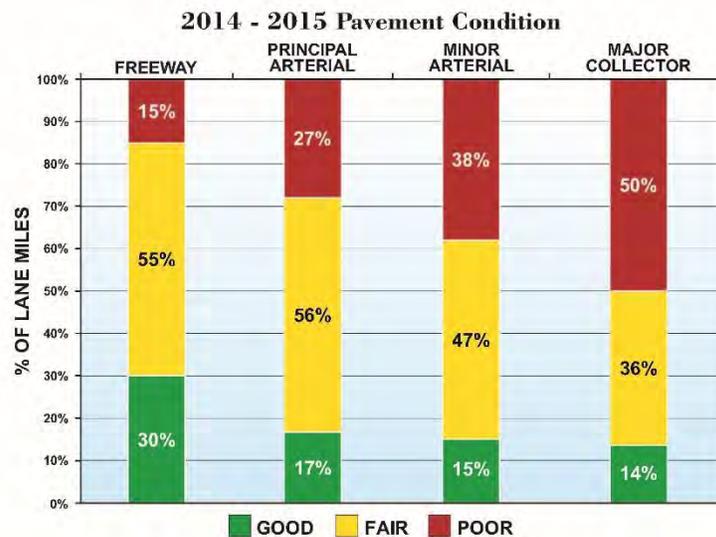
Source: 2014 - 2015 PASER Data Collection
Figure 9

These groups are determined by the extent to which each provides two essential functions; mobility and accessibility. The analysis above compares the 2015 paved federal-aid PASER ratings for each of these individual classification groups.

The analyses of the 2015 paved federal-aid PASER condition data by NFC reveals that the highest level system of Principal Arterials is in the best condition of the three NFC systems. This Principal Arterial system is critical to all multi-state, multi-regional, and much intra-regional travel throughout Michigan and typically carries the highest traffic volumes and the longest trips. The PASER condition data shows a larger percentage of poor pavements in the "middle" NFC system of Minor Arterials. The Minor Arterial system is especially important to support inter- and intra- regional travel, and serves relatively high traffic volumes. Finally, this analysis reveals that the lowest level of federal-aid roads (Collectors) are also in the poorest condition of the three federal aid systems. Collector roads tend to have lower traffic volumes and serve shorter distance trips and/or the beginning or ending legs for longer distance trips, since they provide more accessibility to homes, businesses, and other attractions. This analysis is evidence that Michigan's road agencies are strategically investing their limited transportation funds in the portion of the system that provides the greatest long-distance mobility and highest traffic volumes. However, most trips utilize some of each of the three systems, so in order to have the safest, most efficient federal-aid system possible, funding must be strategically allocated to all three of these NFC systems.

Principal Arterials are at the top of the NFC hierarchical system. Principal arterials generally carry long distance, through-travel movements. They also provide access to important traffic generators, such as major airports or regional shopping centers. The 2014 rating of the *Principal Arterial* system reveals that 28 percent were in poor condition, 56 percent were in fair condition, and 16 percent were in good condition.
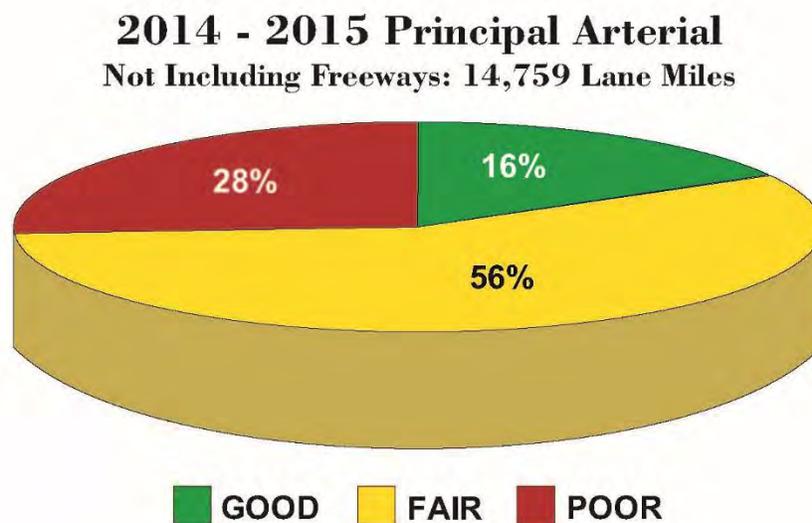
Source: 2014 - 2015 PASER Data Collection
Figure 10

Some examples of Principle Arterials from around the state would be M-24 in Southeast Michigan, 28th Street in the Grand Rapids area, US-2 from St. Ignace to Ironwood, M-72 between Traverse City and Grayling, US-31 from Ludington to Mackinac City, and US-41 from Menominee to Houghton.

2014 - 2015 Freeways
10,044 Lane Miles
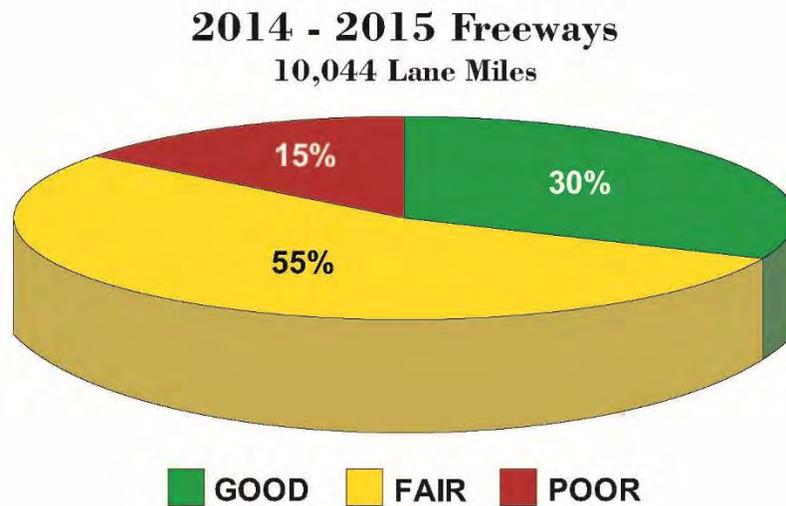
Source: 2014 - 2015 PASER Data Collection
Figure 11

Freeways are a subset of the *Principal Arterial* system that has limited access: no at-grade intersections with other roads, railroads, or trails. Freeways generally carry the highest volume of traffic. The 2015 rating of the *Freeway* system reveals that 15 percent were in poor condition, 55 percent were in fair condition, and 30 percent were in good condition.

Some examples of freeways from around the state would be any of the Interstates, US-23 between Flint and Toledo, Ohio, US-127 from St. Johns to Jackson, and US-131 from Cadillac to Portage.

Michigan has 10,044 lane miles of freeway

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Minor Arterials are similar in function to principal arterials, except they carry trips of shorter distance and to lesser traffic generators. The 2015 rating of the *Minor Arterial* system reveals that 38 percent were in poor condition, 47 percent were in fair condition, and 15 percent were in good condition.

2014 - 2015 Minor Arterial
22,971 Lane Miles

GOOD   FAIR   POOR
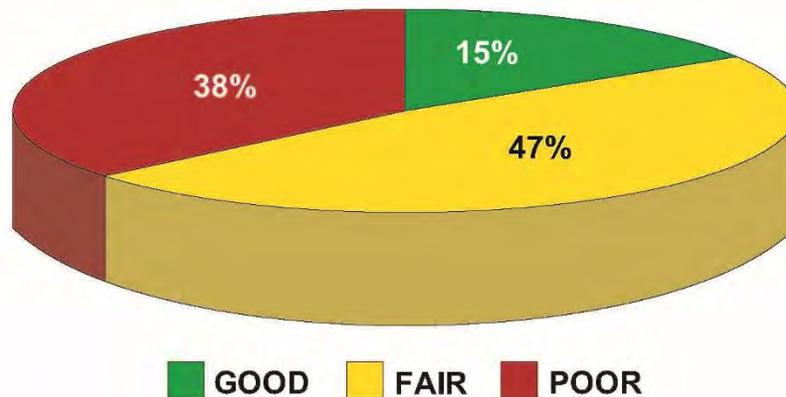
Source: 2014 - 2015 PASER Data Collection
Figure 12

Some examples of minor arterials would be the Belle Isle Bridge in Detroit, W. 16th Street/S. Shoreline Drive in Holland, Hagadorn Road in East Lansing, M-55 between West Branch and Tawas City, M-22 between Traverse City and Manistee, US-41 from Houghton to Copper Harbor, and M-35 between Gladstone and Negaunee.

Example of a minor arterial in poor condition

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Collectors tend to provide more access to property than do arterials. Collectors also funnel traffic from residential and rural areas to arterials. The 2015 rating of the *Collector* system reveals that 50 percent were in poor condition, 36 percent were in fair condition, and 14 percent were in good condition.

2014 - 2005 Major Collector
38,516 Lane Miles

14%

50%

36%

GOOD   FAIR   POOR
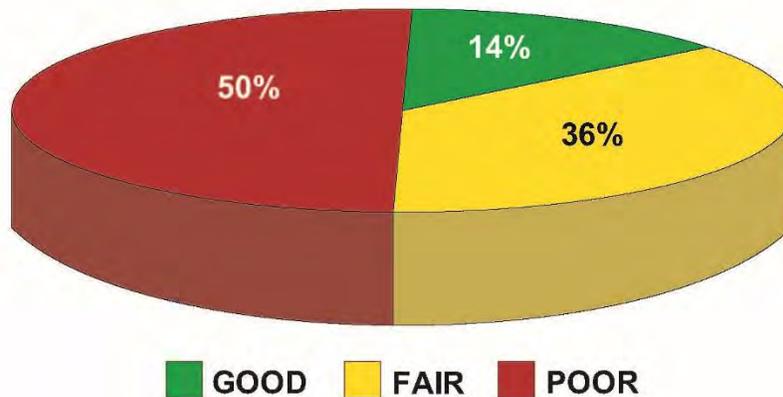
Source: 2014 - 2015 PASER Data Collection
Figure 13

Some examples of major collectors would be Montcalm Street between Cass and Brush in Detroit, Capital City Blvd. at the Capital City Airport in Lansing, N. Burdick Street in Kalamazoo, M-37 on Old Mission Peninsula, Huron Street between US-23 and E. Central Avenue in Mackinac City, Big Bay Road from Marquette to Big Bay, and Canal Street between M-26 and Portage lake in Houghton.

A collector in good condition

2015 Paved Non-Federal-Aid Roads
Rated and Reported to TAMC
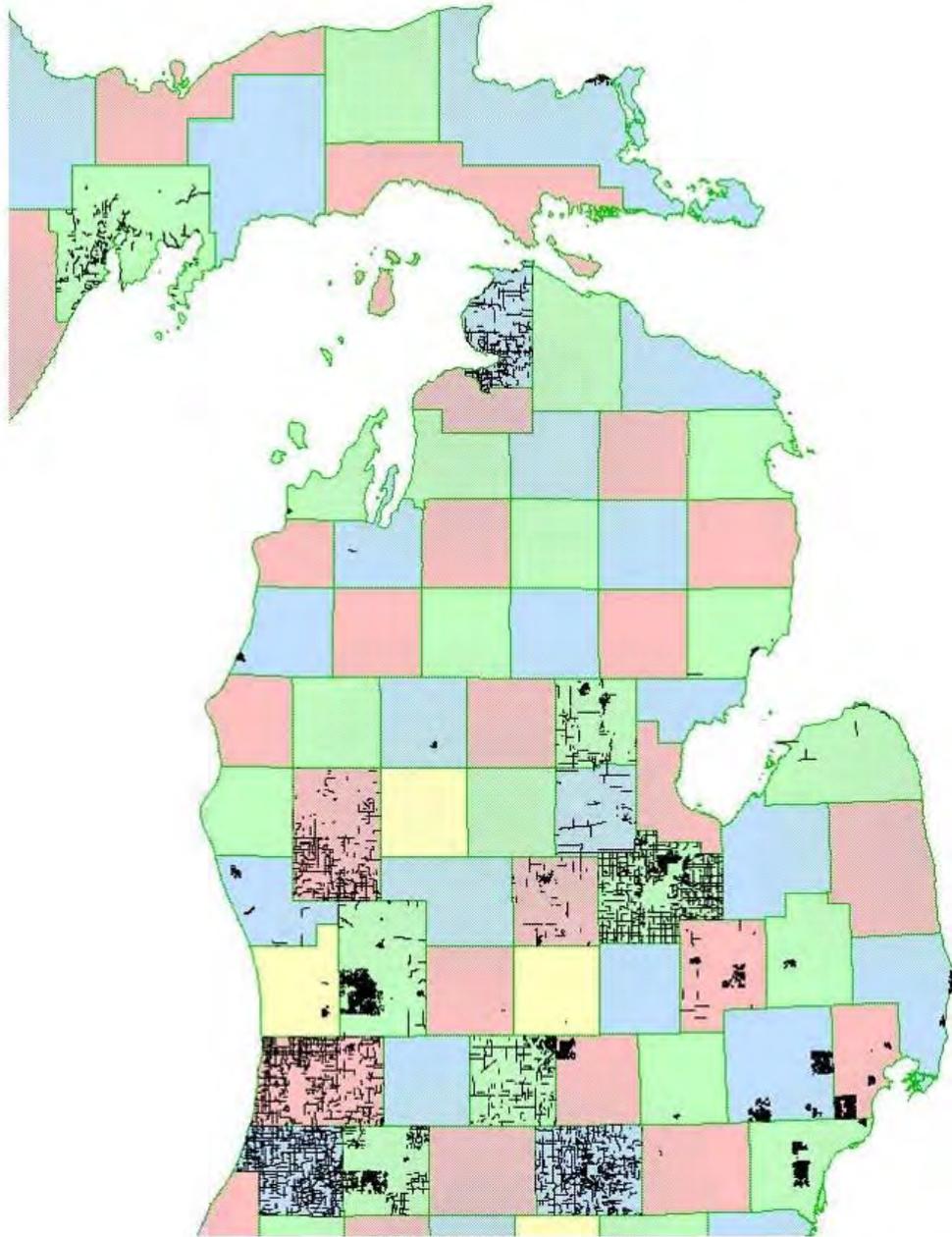
Map Source: 2015 PASER (Paved Non-Federal-Aid) Data Collection

Paved Non-Federal-Aid Roads & Streets

Not all roads in Michigan are eligible for federal-aid. Whether a road is eligible for aid or not depends upon its national functional classification. In general, non-federal-aid eligible roads are residential streets and lightly traveled county roads. Roughly half of these roads are unpaved.

Since its inception, TAMC has focused its attention on the condition of the 39,700 miles of federal aid eligible roads in the state as required by Act 51. In 2008, TAMC expanded its focus to include a major portion of the paved non-federal-aid eligible roads.

2015 Non-Federal Aid Paved Condition
Percent Lane Miles
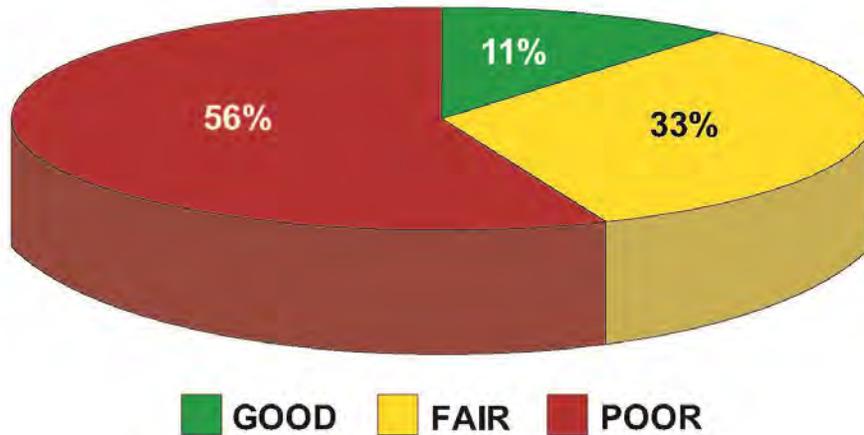
Source: 2015 PASER (Paved Non-Federal-Aid) Data Collection
Figure 14

There are 80,000 miles of non-federal aid eligible roads in the state. Approximately one-half of this mileage (about 40,000 miles) is paved. Just over 17,000 lane miles of these roads were observed and assigned PASER ratings in 2015 and reported to TAMC.
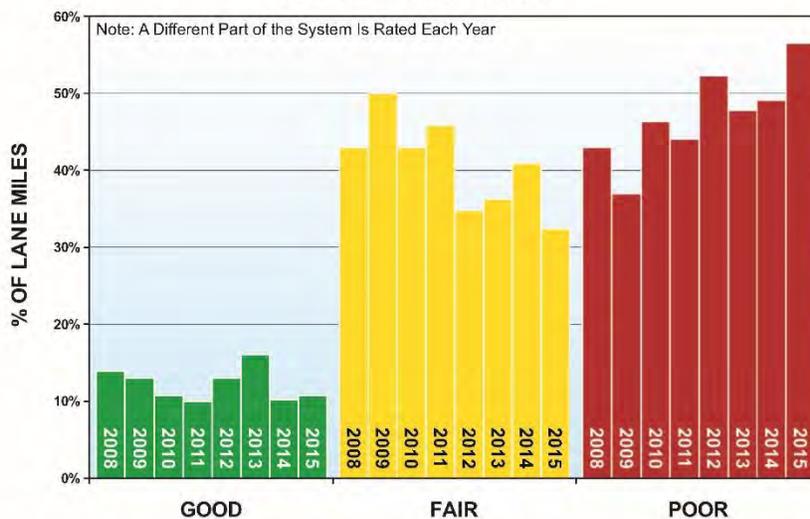
Source: 2008 to 2014 PASER (Paved Non-Federal-Aid) Data Collection
Figure 15

Similar to the pavement ratings for federal-aid roads, the ratings for paved non-federal-aid roads are reported in lane miles. Figure 14 above indicates that 56 percent of lane miles rated and reported to TAMC are in poor condition, 33 percent are in fair condition, and only 11 percent are in good condition. Figure 15 above summarizes pavement ratings reported in 2008-2015. TAMC may elect to expand its efforts in this area in the future.

BRIDGE CONDITIONS

An analysis of bridge conditions in Michigan shows that state, county and village bridge owners and decision makers are continuing to "hold their own" despite rising costs and revenue challenges. From 2004 to 2012, the overall network of bridges in the state saw a slight but steady improvement in overall condition. However, from 2012 to 2015 the improvement in bridge condition has stagnated. This can be attributed to:

1. Progress being made initially in reducing the number of structurally deficient bridges under state jurisdiction.
2. More counties, cities, and villages are implementing preventive maintenance "mix of fixes" strategies on bridges that they own.
3. Rising costs and an increasing inventory of fair bridges creates a preservation need that exceeds available funding.

The percentage of Michigan's bridges which are rated structurally deficient is one of the 5 measures of the overall strength of Michigan's economy, and this measure can be accessed here: https://midashboard.michigan.gov/en/stat/goals/sh4z-hi5j/sdj5-79sn/sv3f-3xc3

2015 Percent Structurally Deficient Bridges
All Highway Bridges: Great Lakes States

| State	% Structurally Deficient Bridges
ILLINOIS	8.4%
INDIANA	9.0%
MICHIGAN	11.7%
MINNESOTA	6.1%
OHIO	7.0%
WISCONSIN	9.1%
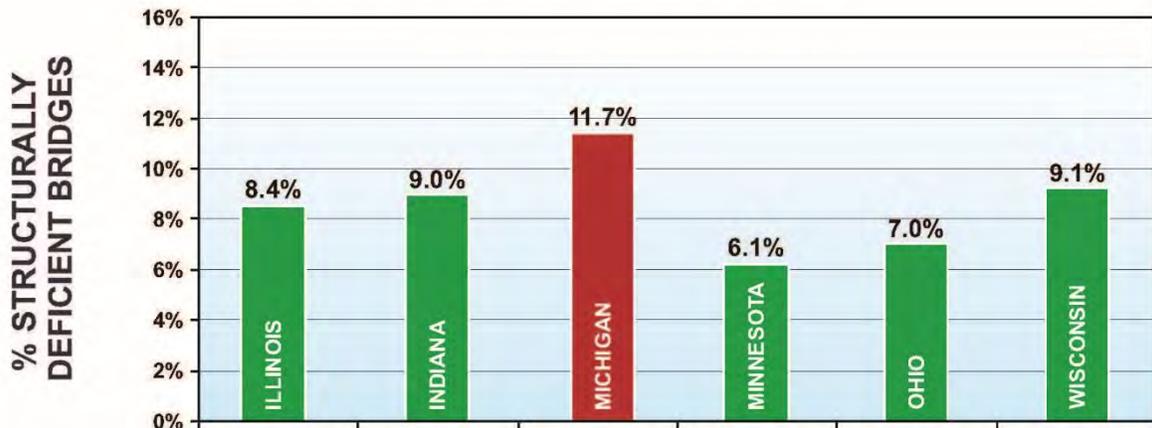
Source: MDOT February 2016
Figure 16

19

Comparing Michigan's progress toward reducing structurally deficient bridges with the rest of the nation and with our neighboring states highlights the need for continued concern regarding Michigan's ability to preserve its strategic bridge assets. Figure 16 above indicates that Michigan has a significantly higher percentage of structurally deficient bridges than other Great-Lakes states. An analysis of the 2015 NBI data shows that 6.0 percent of MDOT bridges and 15.3 percent of county city and village bridges were structurally deficient, resulting in Michigan having 11.7 percent of all highway bridges structurally deficient.
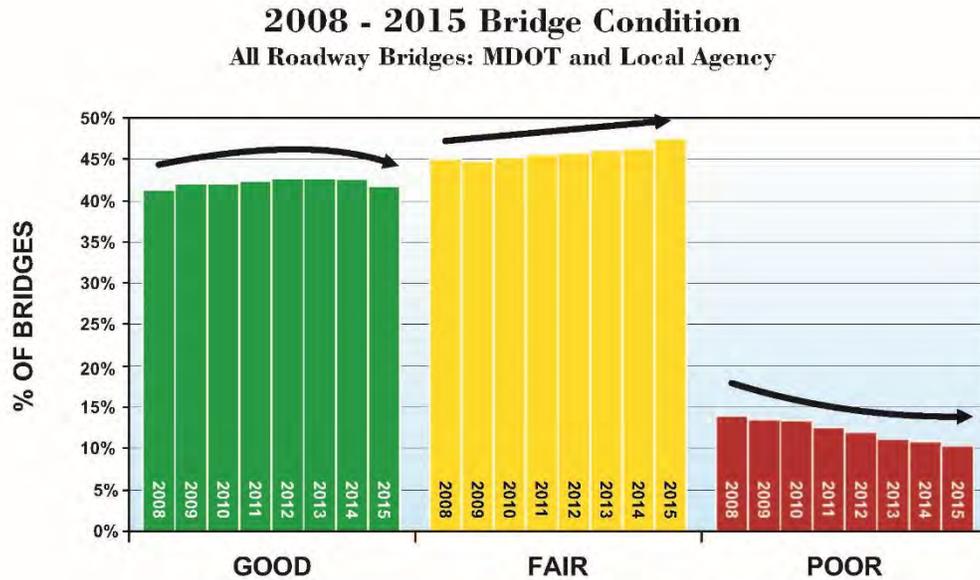
Source: MDOT 2008-15 Michigan Bridge Inventory
Figure 17

Figure 17 above summarizes the percentage of Michigan bridges in good, fair, and poor condition for the years 2008-2015. Michigan state, county, city and village bridge owners and decision makers have reduced the percentage of bridges in poor condition while increasing the number of bridges in good and fair condition. Although the trend-line for the poor category is decreasing, there is some concern that the trend for the good category is also decreasing. Without continued implementation of effective preventive maintenance strategies in local agencies, and additional funding directed toward bridge maintenance, those bridges located on the fair to poor border-line are in danger of dropping into the poor category.

2012 - 2015 Local Bridge Condition Trend
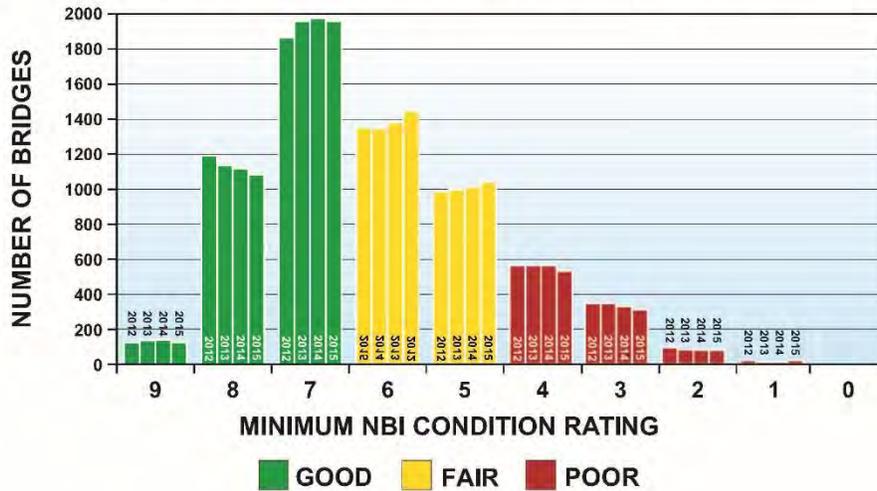
Source: MDOT, 2012-15 Michigan Bridge Inventory
Figure 18

Figure 18 shows that local bridge owners have maintained the number of poor bridges with only slight progress over the last four-years. The number of good bridges has decreased and the number of fair bridges has increased. It is important that local agencies apply strategic preventive maintenance strategies to maintain or reduce the number of bridges in fair condition (NBI Ratings of 5 or 6) to prevent them from dropping into the poor category (NBI Rating <5) where more expensive repairs are necessary.

**2012 - 2015 State Bridge Condition Trend**
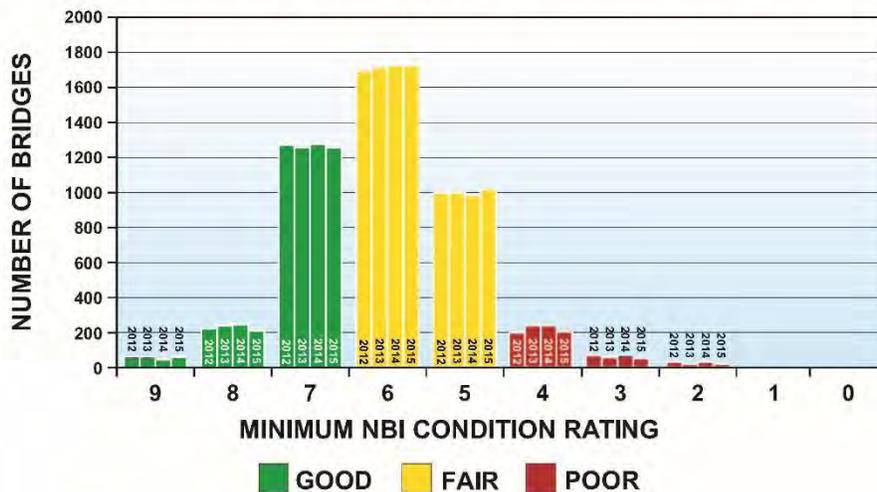
Source: MDOT, 2012-15 Michigan Bridge Inventory
Figure 19

Figure 19 above shows that the MDOT's progress in reducing the number of poor bridges on state-owned roads has slowed over the last four years. Until recently, the MDOT has been able to maintain the number of fair bridges before they reach the poor category, while increasing the number of good and fair bridges. An aging infrastructure and rising costs have reversed some of that progress, and the number of fair bridges has increased with only slight gains in reducing poor bridges as preservation needs exceed available revenues. Maintaining or improving the bridges rated in good or fair condition is imperative to prevent the number of bridges in the poor category (NBI Rating <5) from increasing.

BRIDGE CONDITION FORECASTS

Working from current bridge condition information (NBI Data), bridge deterioration rate, project costs, expected inflation, and fix strategies, the Bridge Condition Forecasting System (BCFS) estimates future condition of MDOT and local bridges. Figure 20 below indicates the combined overall bridge condition of all the state's bridges (both trunkline and local agency) is expected to decline after 2015. By 2025, nearly half of the progress made toward improving bridge conditions since 2004 could be lost. In addition, the condition and forecast data shows the local bridge program could materially benefit from more road agencies actively adopting good capital preventive maintenance strategies.
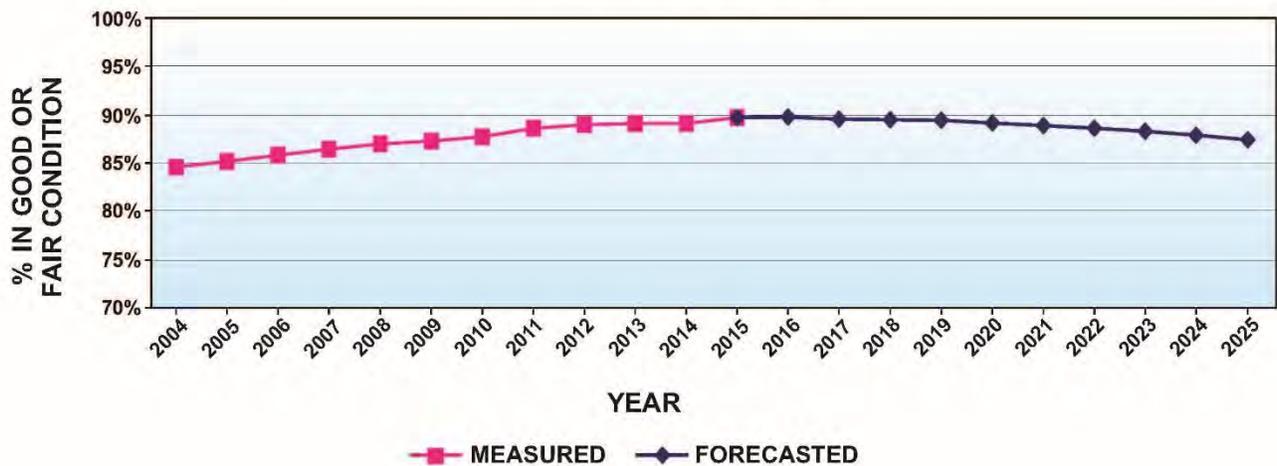

Source: MDOT February 2016
Figure 20

While additional road funding was approved at both the state and federal level, no new funds were earmarked specifically for bridge programs. Therefore this forecast assumes no additional spending on bridges beyond those funds already designated for that purpose.

Figure 21 below shows the percentage of bridges that have improved or deteriorated into each of the major condition categories over the last four years (2012 – 2015). Michigan's overall goal is to reduce the number of poor bridges. Over this time span, 9.8 percent of Michigan's bridges have worsened; 6.6 percent of the bridges went from good to fair, 3.0 percent went from fair to poor, and less than one percent slid all the way from good to poor. In that same three year period, only 6.6 percent of the bridges were improved; 2.8 percent went from fair to good, 1.3 percent went from poor to fair and 2.5 percent went from poor to good.

2012 - 2015 Bridges Cycle of Life
Statewide: Percent of Bridges by Count

9.8% Have Declined

0.2%

6.6%   3.0%

Good	Fair	Poor
36.2% Unchanged	40.0% Unchanged	7.3% Unchanged

2.8%   1.3%

2.5%

6.6% Have Improved
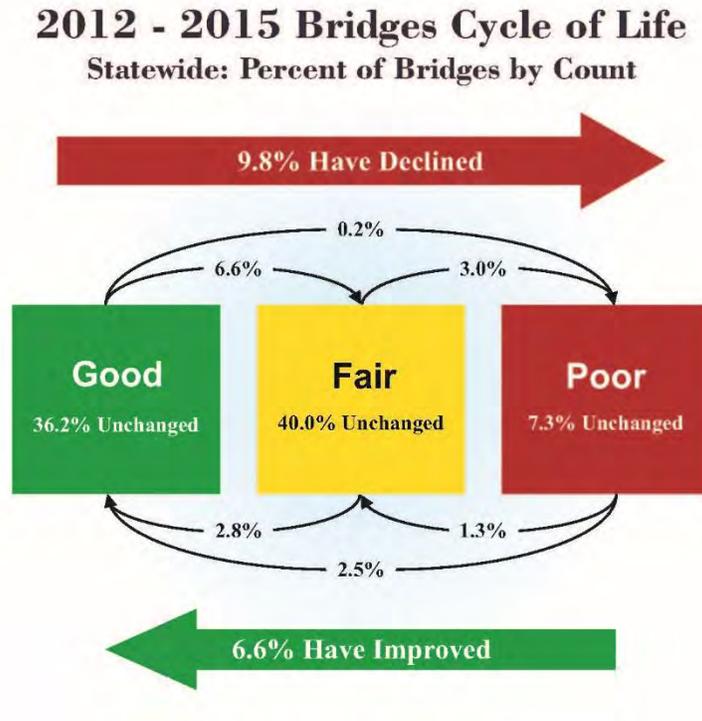
Source: MDOT Feb 2016
Figure 21

MICHIGAN'S TRANSPORTATION ASSET MANAGEMENT COUNCIL – FORMATION AND CHARGE

TAMC was formed under Public Act 499 of 2002 (amended by P.A. 338 of 2006, P.A. 199 of 2007, P.A. 257 of 2010, P.A. 298 of 2012 and P.A. 506 of 2012) to develop a coordinated, unified effort by the various roadway agencies within the state to advise the State Transportation Commission on a statewide asset management strategy.

Mission Statement: To support excellence in managing Michigan's transportation assets by:
1. Advising the Legislature and State Transportation Commission
2. Promoting Asset Management Principles
3. Providing Tools and Practices for Road Agencies

TAMC Training and Education:
TAMC continues to focus on training and educating local agency staff and elected and appointed officials on the benefits of asset management. Please visit the TAMC's website to download the *2015 TAMC Training Program Results Report*. In 2015 TAMC sponsored:

- Two (2) Asset Management Conferences were held, one in the spring in Grand Rapids, and one in the fall in Marquette. Total attendance at these two conferences was 157 participants, which was an increase from the 139 who attended the 2014 conferences.

- Four (4) Introduction to Asset Management for Elected & Appointed Officials Workshops were held statewide and had a combined attendance of 211 participants. Two additional events were conducted to expand the reach of the program, a presentation was made at the Michigan Township Association Annual Meeting in January, and an additional presentation was made in March at the Michigan Municipal League's annual conference. In 2014, these workshops only attracted 113 participants.

- Three (3) Asset Management Workshops were held statewide resulting in a combined attendance of 63 participants compared to only 49 in 2014 when there were four workshops conducted.

- Ten (10) on-site PASER Trainings were held statewide and had 423 participants. In addition, four PASER training webinars were held with an additional 155 participants. In 2014, attendance at the on-site sessions totaled 354 and only 97 participated in the online sessions.

- Three (3) Bridge Asset Management Training Courses were conducted. In total, 26 individuals attended training and provided feedback to help TAMC further develop the training material. As a result of the feedback from 2015 and the attendees at the pilot workshops held in 2013 and 2014, the Council will be modifying the Bridge Asset Management Training Courses into an "Introductory" and an "Advanced" version. This guidance and training is a first of its kind nationally.

- Six on-site training sessions for the integrated Investment Reporting Tool (IRT) & Act 51 Distribution and Reporting System (ADARS) reporting requirement with a total of 199 participants and an additional six webinars with 177 participants in 2015. In total 376 people received training in the integrated IRT/ADARS reporting process.

The 2015 TAMC training program had a total of 880 participants compared to 677 participants trained in 2014. Figure 22 below illustrates total participation in TAMC training programs 2007-2015. While recent attendance numbers have been slightly below the highs experienced in 2008-2009, demand for these trainings is still strong. (For a complete copy of the Training Report, please visit the TAMC website: http://www.mcgi.state.mi.us/MITRP/Council/Default_Council.aspx)
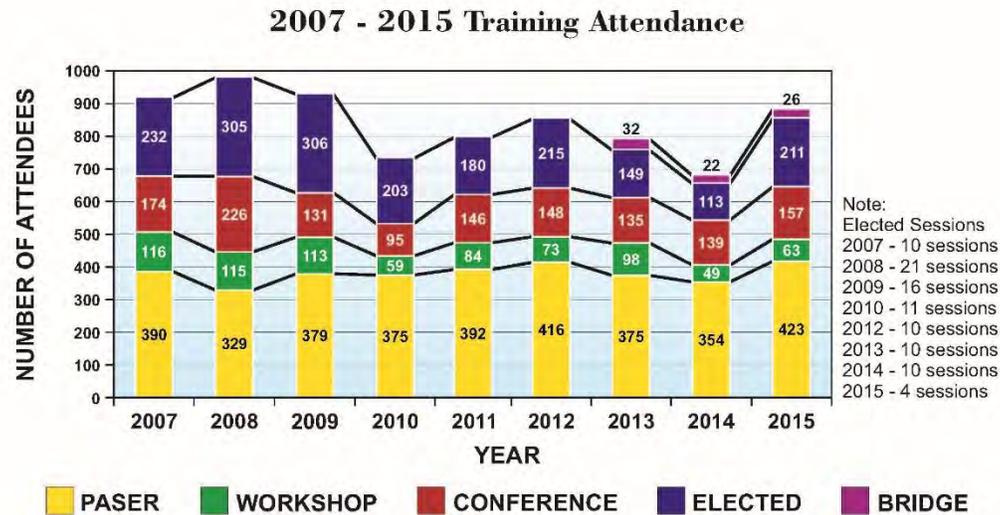

Source: Michigan Tech Center for Technology and Training Report, January 2016
Figure 22

Webpage: The TAMC webpage is currently in the midst of a major overhaul. The new webpage is now compatible with mobile devices like smartphones and tablets. The portions of the website hosting the interactive map, the dashboards, and the log-in portal for uploading PASER, IRT, and ADARS data are still in the old format and will be upgraded later in 2016. *Click* the graphic below to hyperlink to the new website and check out the new look.
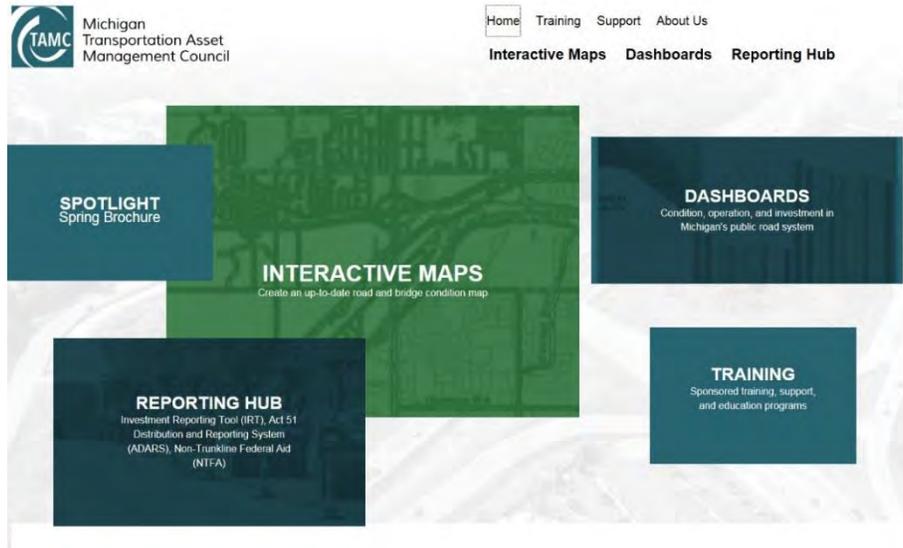

Interactive Map: TAMC maintains a public interactive map that includes historical and most current PASER condition ratings, updated PASER data collection status information, and most current NBI bridge condition information. As noted above, this portion of the TAMC website is still in the old format and it may not be compatible with all mobile devices at this time. However, we expect the upgrade for mobile compatibility to be completed by the fall of 2016. *Click* graphic below for hyperlink to the Interactive Map.
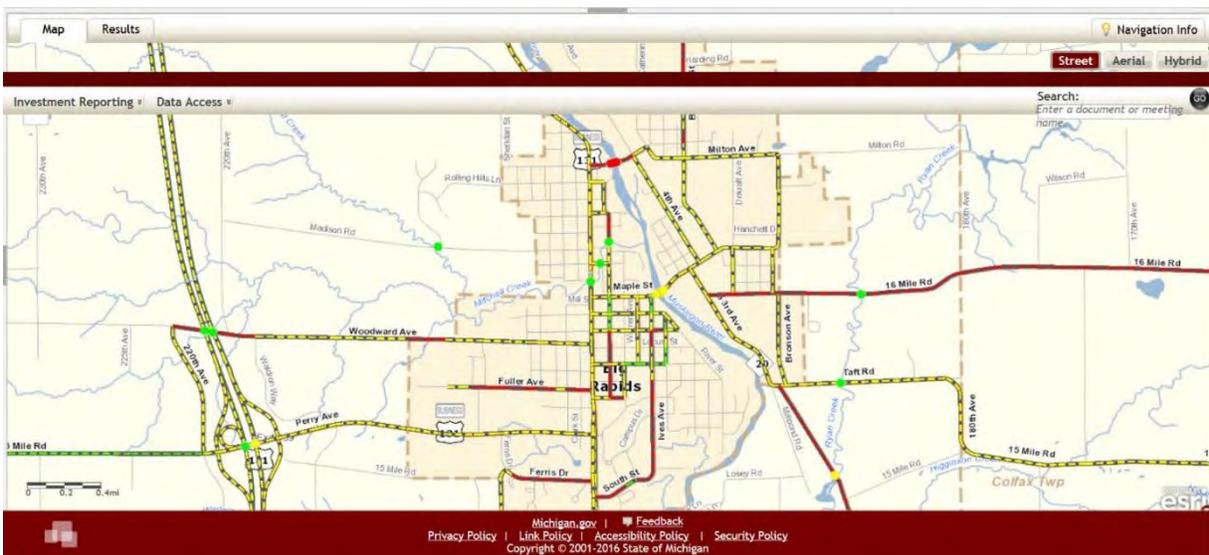
Performance Measure Dashboards: In addition, TAMC has developed and improved upon several Performance Measure Dashboards that show the condition, operation, and investment in Michigan's public road and bridge system. *Click* on each graphic below for hyperlink to the Performance Measure Dashboards. Like the interactive maps, the Dashboards will become more mobile compatible during the upcoming year. Some improvements to the look and usability aspects of the dashboards has already been made to the Traffic, Safety, Maintenance, and Finance Dashboards, and those features will be added to the Pavement and Bridge Dashboards shortly after this Annual Report is published.

Pavement Condition & Pavement Comparison Dashboards – are based on PASER surface condition ratings for all paved federal-aid eligible highways in the state. This includes all state trunklines as well as many roads under the jurisdiction of Michigan's counties, cities & villages. These dashboards illustrate current pavement condition trends over the past 8 years. They also provide the user with the ability to compare recent system performance for up to eight agencies at one time.
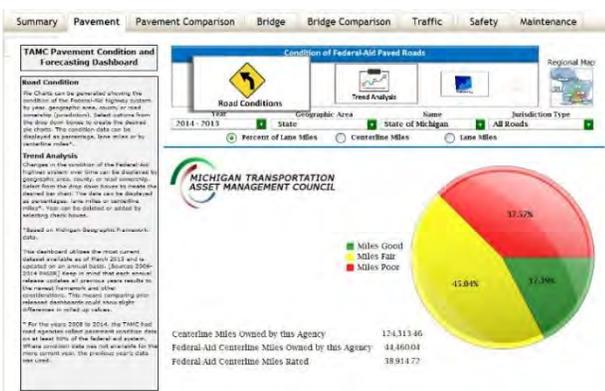
Bridge Condition & Bridge Comparison Dashboards – bridge conditions are based on bi-annual inspections of over 10,000 state, county, city & village owned bridges. These dashboards illustrate bridge condition trends and provide the user with the ability to compare system performance.
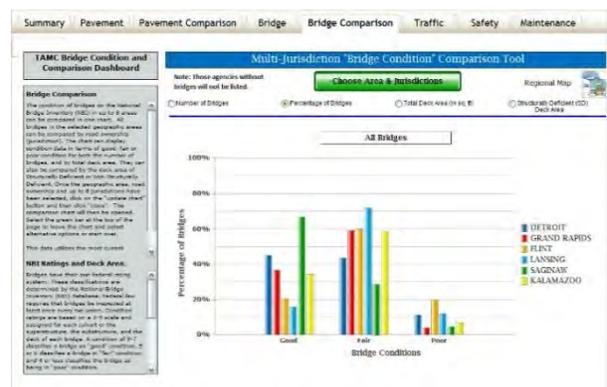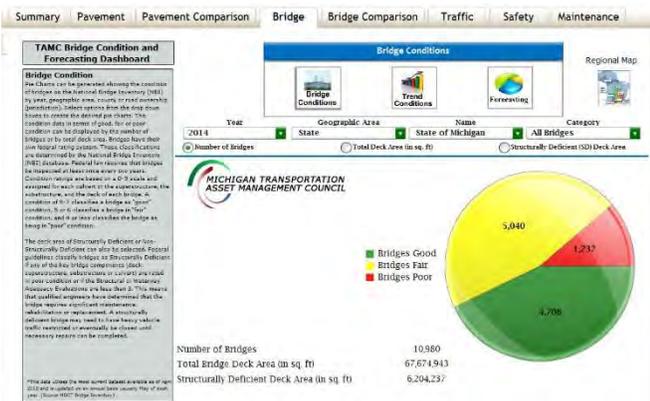

Traffic Dashboard –traffic volumes is a measure of both road use and how effectively the road system is performing. The Traffic dashboard shows estimated annual miles of travel on Michigan's public roadways as well as a comparison of traffic to legal system miles. It is noticeable that the Traffic

Dashboard has a slightly different look this year. The description of the data used for this dashboards that used to occupy a column on the left side of the image can now be accessed by the "Details" button. There is now a "Print" button so that there is no longer a need to use a screen capture utility to copy these charts into a document, or to use them in a presentation. These feature will also be incorporated into the Pavement and Bridge dashboards later in 2016.


Safety Dashboard – the rate of crashes (fatalities, serious injuries) is a measure of how effectively the road system is performing.
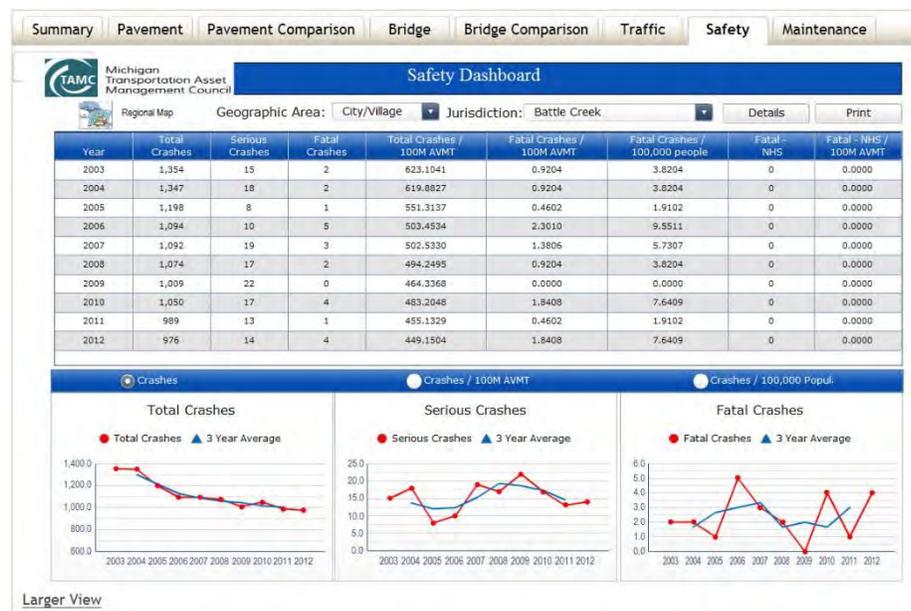
Routine Maintenance Dashboard – is required to keep roads and bridges performing as intended. Anticipated release date: Early 2014.
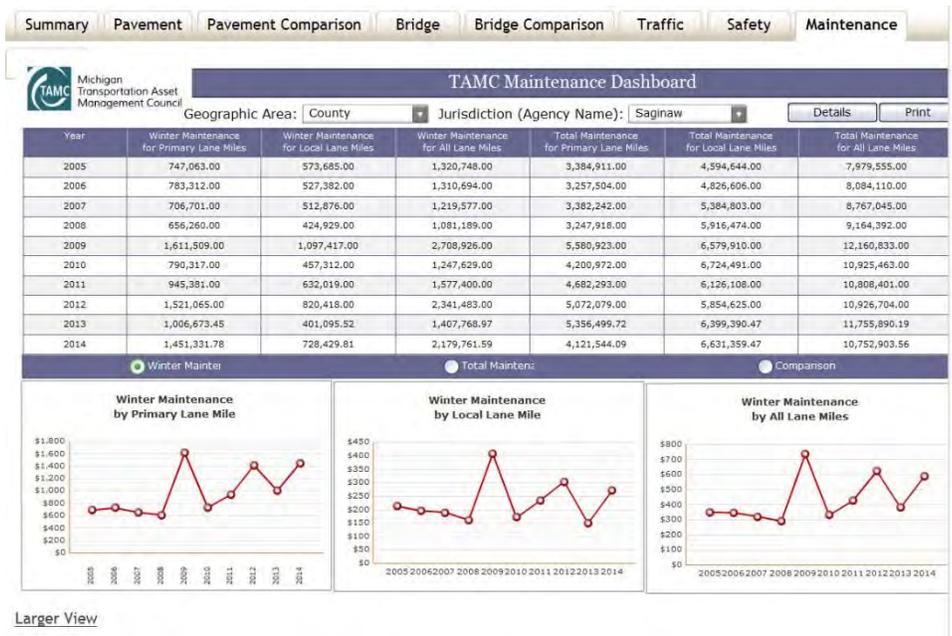
Finance Dashboard – capital investments are necessary to extend the useful life of any asset including roads and bridges. This dashboard illustrates how MDOT and local agencies are investing Act51 funding into the road and bridge system and the revenues received annually.
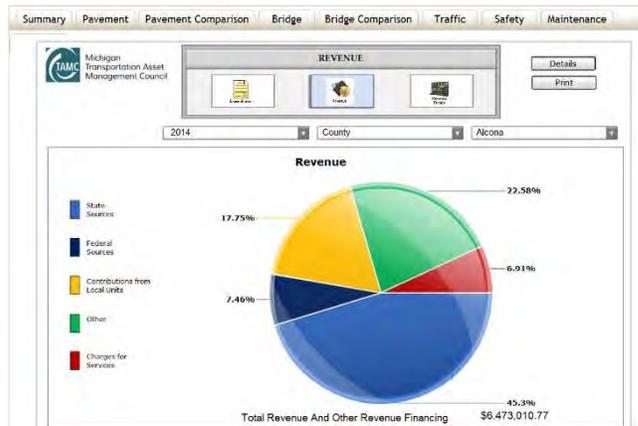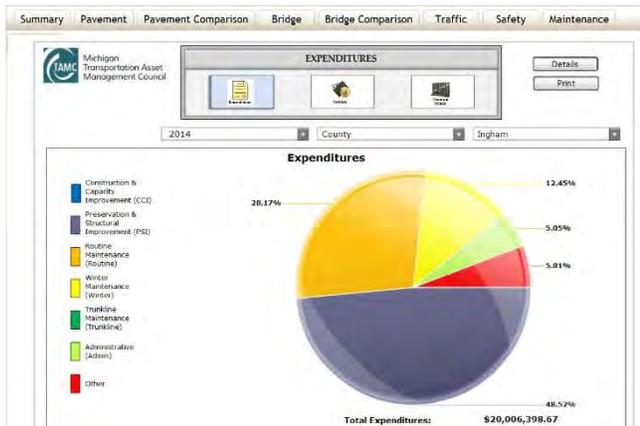
Annual Report: As required by law, TAMC submits an Annual Report to the State Transportation Commission and Michigan Legislature no later than May 2nd of each year. The Annual Report describes the Council's asset management related efforts during the past year, and the condition of the federal-aid eligible portion of Michigan's road & bridge system as measured during the past year.

Asset Management Guide / Sample Asset Management Plan: Working in conjunction with MDOT, in the spring of 2011 TAMC adopted an updated Local Agency Guide for Developing an Asset Management Process/Plan and developed a new Sample Asset Management Plan. This Guide was designed to lead an agency through the steps of an asset management process with the idea that when applied to 600+ local agencies, one size does NOT fit all. This idea ultimately lead to the creation of a tiered (Basic, Moderate, Advanced Levels) sample asset management plan.

Asset Management Guide for Local Agency Bridges in Michigan/Sample Bridge Asset Management Plan: TAMC has developed an Asset Management Guide for Local Agency Bridges in Michigan. The guide is intended to provide assistance to local agency bridge owners and decision makers in understanding bridge management and preservation. In this regard, the guide provides guidance to decision makers and county bridge or highway engineers in the planning, developing, programming, and implementing of effective and efficient capital programs and maintenance actions to preserve the bridges under their jurisdiction; and information to assist local agencies (1) in understanding their bridge network, (2) in the preparation and implementation of a bridge preservation plan, and (3) to support applications for funding under MDOT's Local Bridge Program.

Inventory Based Ratings for Unpaved Roads: To meet the need for a condition assessment system for unpaved roads, TAMC partnered with MTU to develop a process similar to PASER in ease of implementation, but tailor made for assessing relevant features of unpaved roads. The Inventory-Based Rating (IBR) system was created and implemented as a pilot project in five Michigan counties, assessing roads based on Surface Width, Drainage Adequacy and Structural Adequacy. These inventory features were selected because of their impact on road users and the significant cost to create and maintain them. The system defines a baseline condition for each inventory feature, which indicates a good rating in this *good-fair-poor* rating system.

Other Related Publications and Assistance
In addition to the documents identified above, TAMC provides access to other documents related to Asset Management topics, processes, and procedures. TAMC also provides links to contact information about organization or individuals who can assist local agencies with various aspects of asset management. Links to those items can be found here.

New Requirement This Year - TAMC Investment Reporting:

Investment Reporting Tool (IRT) & Act 51 Distribution and Reporting System (ADARS):
In 2011/12, TAMC partnered with MDOT's Financial Operations Division to add the annual project reporting requirements within the IRT to the newly developed online ADARS. In effect, this effort combines two separate annual reporting requirements of road owning agencies (Counties, Cities & Villages) into one to provide the State Legislature with a much clearer understanding of how Michigan Transportation Funds (MTF) are applied at the project level. This report had been voluntary, however, beginning with fiscal years ending after October 1, 2015 this report is now mandatory. TAMC will be reporting on this data in future Annual Reports. *Click* on the graphic below for hyperlink to the log-in screen for uploading both the IRT and ADARS Reports.

Please note: As described on the screenshot below, at some point during 2016, the State of Michigan Single Sign On website will be replaced with a newer but similar MILogin website. Additional information regarding the change from one to the other is available at the locations identified on the screenshot.

TAMC Recognition:

Awards Program: TAMC adopted an awards program to annually recognize those individuals and organizations that support and promote asset management practices. The following individuals and organizations have been recognized since the inception of the awards program in 2009:

Carmine Palumbo Individual Award Winners
Note: In 2015, the TAMC renamed the Individual Achievement Award in honor of Carmine Palombo, the first Chair of TAMC, for his years of service and dedication to the TAMC, to SEMCOG, and to his continuing support of the asset management process.
  2009 – John Daly III, PHD, Genesee County Road Commission
  2009 – Brian Gutowski, Emmet County Road Commission
  2010 – Lance Malburg, Oceana County Road Commission
  2010 – Rob VanEffen, Delta County Road Commission
  2010 – Anamika Laad, East Michigan Council of Governments
  2011 – Edward G. Hug, Southeast Michigan Council of Governments
  2012 – Jim Snell, Grand Valley Metro Council
  2012 – Nathan Fazer, Eastern U.P. Regional Planning & Development Commission
  2012 – Rep. Rick Olson, Michigan Legislature
  2012 – Kelly Bekken, Missaukee County Road Commission
  2013 – Keith Cooper, Michigan Department of Transportation
  2013 – Nico Tucker, Northeast Michigan Council of Governments
  2013 – Toby Kuznicki, City of Rogers City
  2014 – Carmine Palombo, Southeast Michigan Council of Governments
  2014 – Robert E. Clegg, City of Port Huron
  2015 – Carmine Palombo, Southeast Michigan Council of Governments

Organization Award Winners:
  2009 – Michigan Department of Transportation
  2009 – Genesee County Metropolitan Planning
  2009 – City of Manistee
  2009 – City of Marquette
  2009 – Alcona County Road Commission
  2009 – Kent County Road Commission
  2010 – Kalamazoo County Road Commission
  2010 – Roscommon County Road Commission
  2010 – Genesee County Road Commission
  2011 – Ottawa County Road Commission
  2012 – Texas Township
  2014 – Kalamazoo Township
  2015 – Kalamazoo County Road Commission
  2016 – Saint Joseph County Road Commission

SUMMARY OF CURRENT AND FUTURE TAMC EFFORTS

2014- 2016 Work Program – TAMC is coming to the end of the Work Program adopted in the summer of 2013.

A copy of that Work Program can be found here. A new work program outlining and prioritizing the training & education, data collection, project & investment reporting, publications, recognition, public outreach, advancement of asset management in Michigan, performance measures, and research opportunities for the next three-years will be assembled and adopted this summer.

Highlights from the 2014-2016 Work Program include:
- ✓ Develop techniques and tools to inventory and rate unpaved roads.
- ✓ Creation of classes, training material, and support documentation for Bridge related asset management activities.
- ✓ Integration of the IRT and ADARS reporting systems.
- ✓ Increased voluntary reporting of PASER ratings for paved non-federal aid eligible roads.

Things to look for in the 2017 – 2020 Work Program
- ✓ Further analysis of 10 years' worth of PASER data on the federal-aid eligible portion of Michigan's road network and bridge system
- ✓ Increased reporting of PASER data for the paved non-federal aid eligible portion of Michigan's road network
- ✓ New data collection requirements contained in the federal FAST Act
- ✓ A statewide Asset Management Plan focusing on the NHS roads in the state
- ✓ A rating program for the unpaved portion of Michigan's road network
- ✓ A Pilot Study to address new FHWA data collection requirements
- ✓ Increased communication from TAMC

TRANSPORTATION ASSET MANAGEMENT COUNCIL MEMBERS AND THE ORGANIZATIONS THEY REPRESENT

Joanna Johnson (TAMC Chair), County Road Association of Michigan
William McEntee (TAMC Vice-Chair), County Road Association of Michigan
Bob D. Slattery Jr., Michigan Municipal League
Dale Kerbyson, Michigan Municipal League
Dave Wresinski, Michigan Department of Transportation
Brad Wiefrich, Michigan Department of Transportation
Don Disselkoen, Michigan Association of Counties
John Egelhaaf, Michigan Association of Regions
Jonathon R. Start, Michigan Transportation Planning Association
Jennifer Tubbs, Michigan Townships Association
Rob Surber, Michigan Center for Shared Solutions (Non-Voting)

For brief biographical and contact information, please visit:
http://tamc.mcgi.state.mi.us/TAMC/#/aboutus