# MICHIGAN TRANSPORTATION ASSET MANAGEMENT COUNCIL MICHIGAN'S DA RIDGES 2012 ANNUAL REPORT

2008 ROAD CONDITION 2004 - 2012: Percent Good & Fair

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# **TABLE OF CONTENTS**

EXECUTIVE SUMMARY	Pgs. 4-6
TRANSPORTATION ASSET MANAGEMENT IN MICHIGAN	Pgs. 7-9
TRANSPORTATION ASSET MANAGEMENT COUNCIL	. Pgs. 10-14
CONDITION OF THE SYSTEM 2012 Pavement Surface Evaluation System (PASER) Michigan's Annual PASER Condition Assessment – A Team Effort Quality Assurance and Quality Control (QA/QC) Federal-Aid Roads Condition National Highway System (NHS) National Functional Class (NFC) Non-Federal-Aid Roads and Streets Condition Federal-Aid vs. Non-Federal-Aid Roads and Streets Pavement Condition and Vehicle Miles Traveled (VMT) Bridge Condition National Bridge Inventory (NBI)	. Pgs. 15-31
NINE YEAR TREND ANALYSIS Roads – Pavement Cycle of Life 2004-2012 Bridges – Bridges Cycle of Life 2004-2012	. Pgs. 32-33
FORECASTED SYSTEM CONDITION Road Condition – Forecast of Pavement Condition 2013-2023 Bridge Condition – Bridge Condition Forecast System 2013-2023	. Pgs. 34-35
INVESTMENTS IN THE SYSTEM	Pgs. 36
APPENDIX A: MICHIGAN'S ROADS CRISIS UPDATED REPORT	. Pgs. 37-47
APPENDIX B: 2012 TAMC TRAINING PROGRAM RESULTS REPORT	. Pgs. 48-62
APPENDIX C: ACT 51	. Pgs. 63-65
APPENDIX D: COUNCIL MEMBERS	Pg. 66
APPENDIX E: COMMISSION MEMBERS	Pg. 67
APPENDIX F: DEFINITION OF TERMS	. Pgs. 68-69

#### **EXECUTIVE SUMMARY**

The 2012 condition assessment of Michigan's federal-aid eligible roads continues to show that one out of every three miles of road remain rated in "poor" condition. The number of lane miles of roads rated in poor condition decreased from 35% in 2011 to 33.5% in 2012 and the number of lane miles of roads rated in fair condition increased from 45.5% in 2011 to 47.6% in 2012. Projects associated with the American Recovery & Reinvestment Act (ARRA), the unusually mild winter of 2011/12 which allowed for funds normally budgeted for winter maintenance to be available for capital preventative maintenance activities, as well as greater awareness and implementation of asset management principles statewide have likely influenced this increase/decrease in roads rated in fair/poor condition. Though welcome news, the Council does not believe that there is sufficient evidence to suggest the nine-year trend is reversing itself. In fact, condition forecasts show that the road system will continue to deteriorate in the future.



2004 - 2012 Pavement Condition

Allowing this trend to continue will have significant financial and economic consequences. For example, the cost of returning a poor road to good condition is four to five times greater than the cost of maintaining a road in fair condition. Allowing more roads to reach poor condition will dramatically increase the future costs of repairing Michigan's road network.

With respect to Michigan's bridges, progress continues to be made in reducing the number of structurally deficient bridges under state jurisdiction, and more local agencies are implementing preventive maintenance "mix of fixes" on local bridges. Through the efforts of the Council, MDOT's Local Agency Program received an allowance from the Federal Highway Administration in December 2011 to use Federal Highway Bridge Program funding to do systematic preventative maintenance of locally owned roadway bridges. Michigan is one of the first states to be granted this option. During the first year of this option being available, the Local Agency Bridge Program selected forty-nine preventative maintenance projects, which comprised just over half of all project selections.

Federal guidelines classify bridges as *structurally deficient* if at least one of three key bridge components (deck, superstructure, or substructure) is rated in poor condition. This means that qualified engineers have determined that the bridge requires significant maintenance, rehabilitation or replacement. A structurally deficient bridge may need to have heavy vehicle traffic restricted or eventually be closed until necessary repairs can be completed.

An analysis of bridge conditions in Michigan shows that state and local bridge owners and decision makers are "holding their own" despite rising costs and revenue challenges. Bridge conditions continue to be a strategic focus with the development of the MiDashboard, Governor Snyder's set of high level performance measures indicating how the state compares with the rest of the nation in key result areas, along with recent trends. The percentage of Michigan's bridges which are rated structurally deficient is one of the 5 measures of the overall strength of this online Michigan's economy, and measure can be accessed at: www.michigan.gov/midashboard .



# 2012 Percent Structurally Deficient Bridges All Highway Bridges (Great Lakes States)

However, there remains reason for continued concern regarding Michigan's ability to preserve its strategic bridge assets. Figure 2 indicates that Michigan has a significantly higher percentage of structurally deficient bridges than other Great-Lakes states. An analysis of the 2012 NBI submittal shows that 4.9 percent of state-owned bridges and 15.9 percent of county and local bridges were structurally deficient, resulting in Michigan having 11.4 percent of all highway bridges structurally deficient. At current funding levels, the condition of Michigan's transportation infrastructure will continue to deteriorate. This alarming decline in the condition of Michigan's infrastructure affects everyone – from businesses that rely on the transportation network to transport goods and services; from tourists visiting or traveling through our great state to our citizens who expect safe and convenient access to work and school. Reinvesting in our transportation system and maintaining these vital public assets are essential to securing a better future for all of Michigan's citizens.

# TRANSPORTATION ASSET MANAGEMENT IN MICHIGAN

"An ongoing process of maintaining, upgrading and operating assets cost-effectively, based on a continuous, physical inventory and condition assessment." [MCL 247.659(a)]

Asset Management involves collecting physical inventory and managing current conditions based on strategic goals and sound investments. It is a continuous, iterative process enabling managers to evaluate various scenarios, determine trade-offs between different actions, and select the best method for achieving specified goals.

In Michigan, there are 618 public agencies (MDOT, Counties, and Cities & Villages) that have jurisdiction over the road and bridge system of the state. As defined by Public Act 51, each of these agencies receives a set amount of state funding to manage the road and bridge system under their jurisdiction. Some local agencies receive additional funding from local sources (millages, assessments, etc.). Traditionally, public sector management of roads and bridges has been tactical in nature, concentrating on the immediate and most severe problems. In response to this practice, the Michigan Legislature created the Transportation Asset Management Council under Public Act 51 (P.A. 499 of 2002; Amended by P.A. 199 of 2007) to provide a coordinated, unified effort by the various roadway agencies within the state to advise the State Transportation Commission on a statewide asset management strategy. Asset management moves from a "worst-first" approach to one that is strategic in nature. Decisions are made with regard to the long-range condition of the entire system rather than individual projects. This requires considering system condition goals and various investment strategies over a period of time.

It is crucial in an asset management process to have the ability to forecast future road and bridge conditions and perform investment analyses based on various funding and fix scenarios. The strategic component of the process focuses on network level analysis. This component takes into consideration:

- Current condition of the transportation system and its future condition if there is no change in current practices;
- Future condition based on alternative strategies;
- The best time to maintain, preserve, or improve to get maximum useful life from a transportation asset;
- Use of preventative fixes or allow an asset to deteriorate to the point of requiring reconstruction;
- Costs and benefits of each decision; and
- Relation to identified goals and objectives.

It is also necessary to focus on effectively and efficiently managing and operating the transportation system rather than merely reconstructing it. The fundamental elements of an asset management process includes:

- Conduct periodic system condition inventories;
- Identify needs by forecasting system conditions based upon reliable rates of deterioration;
- Establish strategic goals and objectives and performance measures;
- Evaluate investment scenarios based upon forecasted conditions and achievement of goals and objectives;
- Develop and implement a multi-year investment program; and
- Routinely monitor the performance of the system improvements.

# What causes a road to deteriorate?

According to the American Association of State Highway and Transportation Officials (AASHTO) "Those who work with pavements know that after a pavement is built, traffic and environmental loadings create unavoidable stress that will eventually reduce the condition of the roads to a point where they will not be usable without maintenance." (Executive Summary Report: Pavement Management Guide, ASSHTO, November 2001, pgs. 1-2)

When a road is designed and constructed/reconstructed, 20 to 25 years of useful service can be expected before major rehabilitation or reconstruction is needed. The life cycle performance of a highway depends upon the type, time of application, and quality of the maintenance it receives. There are three groups of maintenance: routine, capital preventative and reactive maintenance. Routine maintenance consists of the on-going, planned activities such as snow removal, street sweeping, crack sealing, and mowing. Capital preventative maintenance activities protect the pavement and decrease the rate of deterioration of the pavement quality. Reactive maintenance activities are performed to correct a specific pavement problem such as potholes.

Delays in applying maintenance fixes increase the severity of pavement defects and increase the costs to correct those defects. When the defect is finally corrected, the cost is much greater.

# The heart of asset management is a sound capital preventive maintenance program (CPM).

Act 51 defines preventive maintenance as "a planned strategy of cost-effective treatments to an existing roadway system and its appurtenances that preserve assets by retarding deterioration and maintaining functional condition without significantly increasing structural capacity." [MCL 247.660(c)] A sound capital preventative maintenance program minimizes the effects of the elements (sunlight/weather) on road deterioration and ensuring that the 20-25 years of useful service from the road is achieved. CPM is extremely important in an era of tight funding. Studies have shown that for every dollar spent on CPM an agency can delay spending \$4 to \$6 dollars on reconstruction.

The purpose of a CPM program is to protect the pavement structure, slow the rate of deterioration and correct surface deficiencies. The National Center for Pavement Preservation notes that: "In the past, many CPM practices have not been effective because they were applied reactively to roads in poor condition instead of proactively to roads still in good condition. The correct approach to CPM is to 'place the right treatment on the right road at the right time.' Traditional approaches waited until deficiencies became evident, even to the untrained observer, at which time, the road agency was trapped into the unfavorable choice of either applying major rehabilitation or complete reconstruction. By the time deficiencies became evident to the observer, irreversible underlying structural damage has often already occurred and it is too late to apply preventive treatments." (Pavement Preservation: Applied Asset Management, National Center for Pavement Preservation, Department of Civil and Environmental Engineering, MSU, November 2006, pgs. 1-3)

# "Window of Opportunity"

Figure 3 below illustrates the concept in which certain types of treatments are more feasible to use than others. The curved line show how a pavement deteriorates over time. There are certain points along the curve where different types of work activities no longer are feasible. These points define the **"window of opportunity."** 



Figure 3

The portion of Figure 3 outlined in green/dashed-line is the area where CPM activities take place with the most effectiveness. With tight budgets and scarce funds, agencies need to optimize the performance of their existing systems. A CPM program is designed to extend the life of good and fair pavements by applying lower cost treatments. These slow the rate of deterioration.

# TRANSPORTATION ASSET MANAGEMENT COUNCIL

# Formation and Charge:

The Transportation Asset Management Council (Council) was formed under Public Act 499 of 2002 (amended by P.A. 199 of 2007) 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. For more information on the State Transportation Commission please see APPENDIX E of this report or visit MDOT's Website: <u>www.michigan.gov/mdot</u>. The Council is comprised of ten (10) voting members; two (2) from the Michigan Department of Transportation (MDOT), two (2) from the Michigan Municipal League (MML), two (2) from the County Road Association (CRAM), one (1) from the Michigan Association of Counties (MAC), one (1) from the Michigan Township Association (MTA), one (1) from the Michigan Center for Shared Solutions (MCSS). For more information on Council members please see APPENDIX D of this report or visit the Council's Website: <u>www.michigan.gov/tame</u>

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

# Ten-Years of Asset Management 2002-2012:

In October of 2012 the Council celebrated its ten-year anniversary. In that time, Council members have developed and maintained a working relationship between all road owning jurisdiction of the State, gained consensus on many significant issues including a single statewide asset management strategy, adoption of the PASER condition rating system, nine-years of inventory and condition ratings on the paved federal-aid system, published ten (10) annual reports, sponsored several annual conferences and trained over 8,000 individuals on the concept of asset management. The Council has been instrumental in laying the foundation of asset management in the State of Michigan and expects to build upon that foundation for many years to come.

# Accomplishments & Activities over the Past Year:

**Training & Education:** the Council continues to focus on training and educating local agency staff and elected and appointed officials on the benefits of asset management. Please see APPENDIX B for the "2012 TAMC Training Program Results Report". In 2012 the Council sponsored:

- Two (2) Asset Management Conferences were held in the spring/Livonia and fall/Marquette and had a total attendance of 148 participants, which is a slight increase from 2011.
- Ten (10) Introduction to Asset Management for Elected & Appointed Officials Workshops were held statewide and had attendance of 215 participants, which is a 19% increase form 2011.
- Five (5) Asset Management Workshops were held statewide and had attendance of 73 participants, which was a slight decrease from 2011.

- Ten (10) on-site PASER Trainings were held statewide and had 416 participants, which represents an slight increase from 2011.
- Ten (10) Investment Reporting Tool Webinar Trainings were held online and had attendance of approximately 150 participants.

Website: <u>www.michigan.gov/tamc</u> the Council continues to revise and update its website to improve ease of use and add content, for example:

- Interactive Map: In 2012, the Council added features to the public interactive map that includes historical and most current PASER condition ratings, updated PASER data collection status information, and most current National Bridge Inventory (NBI) condition information, see link: http://www.mcgi.state.mi.us/MITRP/Data/paserMap.aspx
- Performance Measure Dashboards: In addition, the Council developed and improved upon several Performance Measure Dashboards that show the condition, operation, and investment in Michigan's public road and bridge system. These dashboards are located on the Council website, see link: http://www.mcgi.state.mi.us/MITRP/Data/PaserDashboard.aspx
  - Pavement Condition & Pavement Comparison Dashboards is based on paved surface ratings for state highways as well as roads under the jurisdiction of Michigan's counties, cities & villages. These dashboards illustrate pavement condition trends and provide the user with the ability to compare system performance with up to eight agencies.
  - 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.
  - Finance Dashboard capital investments are necessary to extend the useful life of any asset including roads and bridges. The Expenditures dashboard illustrates how MDOT and local agencies are investing Act51 funding into the road and bridge system. In addition, a Revenue dashboard is currently in development and is anticipated to be released: Summer 2013
  - *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.
  - Safety Dashboard the rate of crashes (fatalities, serious injuries) is a measure of how effectively the road system is performing. Anticipated release: Fall 2013
  - *Routine Maintenance Dashboard* is required to keep roads and bridges performing as intended. Anticipated release: Winter 2013/14.

#### **Publications:**

- Annual Report: By May 2<sup>nd</sup> of each year (since 2003), the Council submits an Annual Report to the State Transportation Commission and Michigan Legislature describing the asset management related efforts and condition of the road & bridge system from the year prior. All reports are available online, see link: http://www.mcgi.state.mi.us/MITRP/Contact/Reports.aspx
- Asset Management Guide / Sample Asset Management Plan: Working in conjunction with MDOT, in the spring of 2011 the Council 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 <u>NOT</u> fit all. This idea ultimately lead to the creation of a tiered (Basic, Moderate, Advanced Levels) sample asset management plan. Each local agency now has both documents access to of these online, see link: http://www.mcgi.state.mi.us/MITRP/Council/AssetManagementPlans.aspx
- Asset Management Guide for Local Agency Bridges in Michigan/Sample Bridge Asset Management Plan: The Council 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. То review this guide, see link: http://www.mcgi.state.mi.us/MITRP/document.aspx?id=746

As a result of this effort, the Council has contracted with TranSystems to develop a pilot training course to assist local bridge owning agencies in adopting asset management principles/plans for their bridge assets. This pilot training course is anticipated to be completed by Spring 2013.

#### **Investment Reporting:**

• Investment Reporting Tool (IRT) & Act 51 Distribution and Reporting System (ADARS): In 2011/12, the Council 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.

#### **Recognition:**

- Awards Program: The Council adopted an awards program to annually recognize those individuals and organizations that support and promote asset management practices. The following individuals and organizations received awards in 2009 2012:
  - Individual Award Winners:
    - John Daly III, PHD 2009
    - Brian Gutowski, Emmet County Road Commission 2009
    - Lance Malburg, Oceana County Road Commission 2010
    - Rob VanEffen, Delta County Road Commission 2010
    - Anamika Laad, EMCOG 2010
    - Edward G. Hug, SEMCOG 2011
    - Jim Snell, GVMC 2012
    - Nathan Fazer, EUPRPDC 2012
    - Rick Olson, Michigan Legislature 2012
    - Kelly Bekken, Missaukee County Road Commission 2012
  - o Organization Award Winners:
    - 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 2009
    - Kalamazoo County Road Commission 2010
    - Roscommon County Road Commission 2010
    - Genesee County Road Commission 2010
    - Ottawa County Road Commission 2011
    - Texas Township 2012

#### Governor Snyder's Special Message on Infrastructure:

In October 2011, Governor Snyder delivered a special message on public infrastructure titled 'Reinventing Michigan's Infrastructure: Better Roads Drive Better Jobs'. In that message, the Governor stated that Michigan's infrastructure is deteriorating from a lack of investment. The Governor laid out a multi- step plan to meet the challenge of improving our infrastructure that included reforms to current practices, revenue enhancement, and public transit improvements.

As part of that message, Governor Snyder recognized that Michigan is a leader in managing our road and bridge assets with a long term vision. This is, in part, due to the efforts of the Council. He urged the continuation and expansion of asset management principles as part of his vision to improve our underfunded transportation infrastructure. To review this message in its entirety, see link:

http://www.youtube.com/watch?feature=player\_embedded&v=WoThjD90qzM

#### 2013 State of the State Address:

On January 1, 2013, Governor Snyder delivered his third State of the State address in which he addressed investing more in Michigan's infrastructure, simply stating "it's time". At the time of the publication of this report the Legislature was considering several possible scenarios for an additional 1.2-1.4 billion in annual revenue for infrastructure.

# Updated Michigan Roads Crisis Report

On March 10, 2013 former Representatives Rick Olson published an update to the September 2011 report of the Work Group on Transportation Funding, of the House of Representatives Transportation Committee titled "Michigan's Roads Crisis: What Will It Cost to Maintain Our Roads and Bridges?" [See APPENDIX A to view the full report]. This report relied on the PASER condition data supplied by the Transportation Asset Management Council and analysis completed by MDOT staff.

## **CONDITION OF THE SYSTEM 2012**

# Pavement Surface Evaluation and Rating System (PASER):

The Council chose the Pavement Surface Evaluation and Rating System (PASER) because the data it uses is easy to collect; it is of sufficient detail for statewide, network-level analysis; and it is the method currently used by most road agencies in Michigan. PASER is a visual survey of the condition of the surface of the road. It rates the condition of various types of pavement distress on a scale of 1-10. It is based on a system of pavement evaluation developed in Wisconsin and is used by many road agencies in the state. This type of survey is one of the easiest to do and is relatively inexpensive compared to other rating methods. This makes it ideal for small agencies.

While PASER is a subjective method, it is based on sound engineering principles. PASER measures "surface distress." It does not measure structural capacity, ride quality or friction. The Council groups the 1-10 rating scale into three categories (Good 8-10, Fair 5-7, Poor 1-4) based upon the type of work that is required for each rating (Routine Maintenance, Capital Preventive Maintenance, Structural Improvement).

**Routine Maintenance (RM)** is the day-to-day, regularly-scheduled activities to prevent water from seeping into the surface such as street sweeping, drainage clearing, gravel shoulder grading, and sealing cracks. PASER ratings 8, 9, and 10 are included in this category. This category also includes roads that are newly constructed or recently seal coated. They require little or no maintenance. In popular nomenclature *these roads are considered "good."* 

**Capitol Preventive Maintenance (CPM)** is a planned set of cost effective treatments to an existing roadway that retards further deterioration and maintains or improves the functional condition of the system without significantly increasing the structural capacity. The purpose of CPM fixes is to protect the pavement structure; slow the rate of deterioration; and/or correct pavement surface deficiencies. PASER ratings 5, 6, and 7 are included in this category. Roads in this category still show good structural support but the surface is starting to deteriorate. CPM is intended to address pavement problem **before** the structural integrity of the pavement has been severely impacted. **These roads are considered "fair."** 

Structural Improvement (SI) is necessary for roads assigned a PASER rating of 1, 2, 3, or 4 which require some type of structural improvement such as resurfacing or major reconstruction. Alligator cracking is evident. Rutting is beginning to take place. Road rutting is evidence that the underlying structure is beginning to fail and it must be either rehabilitated with a fix like a crush and shape or it must be totally reconstructed. These roads are considered "poor."

# Michigan's Annual PASER Condition Assessment – A Team Effort:

Every year since 2004 the Council contracts 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 comprised of a representative from MDOT, RPO/MPO, and local agency (County, City/Village) embark on an effort to rate at least 50% 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):

Over 100 teams of trained raters assess the condition of a minimum of 50% of all paved federalaid eligible roads annually. Data quality is of utmost importance to the Council. Accurate PASER ratings depend on the judgment of the raters. Therefore, every year raters are required to attend PASER training and review the rating criteria and shown how various types of pavement distress define rating. 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 results of this comparison are shown the Figure 4 below. The blue line represents the absolute difference between the team ratings and the QC ratings. The red line represents the absolute difference that have been weighted by segment length and by removing anomalies, most commonly where a road has been repaired between the time when the team observed the road and when the QC rater observed the same road. Just over 90 percent team / QC ratings differ by only one rating point.



# **2012 Quality Control**

# **PAVEMENT CONDITION**

# Federal-Aid Roads

In 2012, the Council required that only 50 percent of the paved federal-aid eligible roads be rated, with the other 50 percent having been rated in 2011.



Source: TAMC 2012 PASER Data Collection Figure 5

Even though agencies were only required to report 50 percent, approximately 67 percent of these roads were rated and reported in 2012 and 63 percent reported in 2011. Analysis of the data collected indicated that while 67 percent of the system condition was collected, it was statistically representative of the entire system.

The data is reported in lane miles. A lane mile is determined by multiplying the number of lanes by the length of the road. For example, if you were surveying five miles of two-lane road, you would be rating ten lane miles. If it were a four-lane road, then you would have twenty lane miles.



Figure 6 above shows the results of the 2012 rating reveal that 33.6 percent (19,016 lane miles) were in "poor" condition, 47.6 percent (26,987 lane miles) were in "fair" condition, and 18.8 percent (10,645 lane miles) were in "good" condition.



# 2012 Federal-Aid PASER Ratings

Figure 7 above shows the breakdown of the 2012 pavement condition by lane miles and individual PASER ratings (Good 8-10, Fair 5-7, Poor 1-4). 18



Source: TAMC 2004 – 2012 PASER Data Collection Figure 1

Figure 1 above shows that for the first time in nine-years, the number of roads rated as being in poor condition reduced by 1.5% and the number of roads rated in fair condition increased by 2.1%. Though welcome news, the Council does not believe that there is sufficient evidence to suggest the nine-year trend is reversing itself. In fact, one out of every three miles of road on the federal-aid eligible road system remain rated in poor condition and the Council projects that the situation will only get worse in the future (see Pg.34 of this report).

In 2004, 13.6 percent of lane miles were identified as needing structural improvement. By 2012, that number had more than doubled to 33.6 percent. In 2004, nearly 88 percent of the federalaid system could be considered in good or fair shape. By 2012, that figure fell to 66.4 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 poor road to good condition is four to five times greater than the cost of returning a fair road to good condition. Allowing more roads to reach poor condition will dramatically increase the costs of repairing Michigan's road network.



Figure 8 above shows the breakdown of the 2009-2012 pavement condition by lane miles and individual PASER ratings (Good 8-10, Fair 5-7, Poor 1-4). For 2012 a direct correlation can be made between the decreases in the number of lane miles receiving "poor" ratings of 2-4 and the increases in the number of lane miles receiving "fair" ratings of 5-7. There is also a decrease in the number of lane miles receiving "good" ratings of 8-10. This may be due to a variety of factors, including completed improvement projects associated with the American Recovery & Reinvestment Act (ARRA), the unusually mild winter of 2011/12 allowing for funds normally budgeted for winter maintenance to be available for capital preventative maintenance activities, as well as greater awareness and implementation of asset management principles statewide.

# Moving Ahead for Progress in the 21<sup>st</sup> Century (MAP-21)

MAP-21 is the first long-term highway authorization enacted since 2005 and was signed into law by President Obama on July 6, 2012. Funding surface transportation programs at over \$105 billion for Fiscal Years 2013 and 2014. 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.



Source: MDOT 2013 Figure 9

# 2012 National Highway System Pavement Condition



Similar to the pavement ratings for federal-aid roads, the ratings for National Highway System (NHS) roads are reported in lane miles. Figure 10 above indicates that 6,271 miles of NHS roads were rated in 2012, comprising 15,642 lane miles. The 2012 ratings reveal that 16 percent (2,479 lane miles) are in poor condition, 60 percent (9,407 lane miles) are in fair condition, and 20 percent (3,756 lane miles) are in good condition.

# National Functional Classification (NFC)

Since its inception, the Council's primary focus has been on how the transportation system functions. National Functional Classification (NFC) is a planning tool which federal, state and local transportation agencies have used since the late 1960's. The Federal Highway Administration (FHWA) developed this system of classifying all streets, roads and highways according to their function. The federal-aid system is subdivided into four major classification groups, Principal Arterials, Freeways (a subset of Principal Arterials), Minor Arterials and Collectors. These groups are determined by the extent to which each provides two essential functions; mobility and accessibility. The analysis below compares the 2012 paved federal-aid PASER ratings broken down by each of these classification groups. MAP-21 specifies that all Principal Arterials shall be included in the NHS, along with NHS intermodal connectors.

**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 2012 rating of the *Principal Arterial* system reveals that 16 percent (2,467 lane miles) were in poor condition, 60 percent (9,392 lane miles) were in fair condition, and 24 percent (3,753 lane miles) were in good condition.

**Freeways** are a subset of the *Principal Arterial* system that has limited access: no atgrade intersections with other roads, railroads, or trails. Freeways generally carry the highest volume of traffic.





The 2012 rating of the *Freeway* system reveals that 9 percent (547 lane miles) were in poor condition, 63 percent (3,858 lane miles) were in fair condition, and 28 percent (1,754 lane miles) were in good condition.

**Minor Arterials** are similar in function to principal arterials, except they carry trips of shorter distance and to lesser traffic generators.





The 2012 rating of the *Minor Arterial* system reveals that 30 percent (4,645 lane miles) were in poor condition, 51 percent (7,802 lane miles) were in fair condition, and 19 percent (2,949 lane miles) were in good condition.

**Collectors** tend to provide more access to property than do arterials. Collectors also funnel traffic from residential to rural areas to arterials.





The 2012 rating of the *Collector* system reveals that 47 percent (11,903 lane miles) were in poor condition, 38 percent (9,793 lane miles) were in fair condition, and 15 percent (3,944 lane miles) were in good condition.

The analyses of the 2012 paved federal-aid PASER condition data by National Functional Classification (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.

# Non-Federal-Aid Roads and 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.



Source: TAMC 2012 PASER Data Collection Figure 15

Since its inception, the Council 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, the Council expanded its focus to include a major portion of the paved non-federal-aid eligible roads.

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 8,623 lane miles of these roads were observed and assigned PASER ratings in 2012, 9,766 lane miles in 2011; 4,296 lane miles in 2010, 5,647 lane miles in 2009; and 11,557 lane miles in 2008.



Source: TAMC 2012 PASER Data Collection Figure 16

Similar to the pavement ratings for federal-aid roads, the ratings for non-federal-aid roads are reported in lane miles. Figure 16 above indicates that 8,623 miles of non-federal-aid roads were rated in 2012, comprising 8,621 lane miles. The 2012 ratings reveal that 51.8 percent (4,467 lane miles) are in poor condition, 35 percent (3,018 lane miles) are in fair condition, and 13.2 percent (1,137 lane miles) are in good condition.



2008 - 2012 Pavement Condition of Non-Federal-Aid Roads

Figure 17 above shows the results of the three-year data collection cycle (2008-12) sponsored by the Council.

#### Federal-Aid vs. Non-Federal-Aid Roads and Streets



Source: TAMC 2012 PASER Data Collection Figure 18

The data shown in Figure 18 above indicate that the condition of the paved non-federal-aid system is significantly worse than that of the paved-federal-aid system. One reason for this is the fact that more funding is available for federal-aid roads.

2012 Condition of Paved Roads Federal-Aid vs. Non-Federal-Aid

# Pavement Condition and Vehicle Miles Traveled (VMT)

Vehicle Miles Traveled (VMT) is the total number of miles driven by all vehicles in Michigan during any given year.



2012 Pavement Condition & VMT

Figure 19

The data shown in Figure 19 above indicate that the majority of traffic (77 percent of VMT) travels on the part of the system (67 percent) that has been rated as good and fair condition. While roads in poor condition make up 33 percent of the paved federal-aid system, they carry only 23 percent of all vehicle miles traveled. This difference is largely attributed to the efforts of road agencies to maintain higher volume roads in better condition than lower volume roads. This suggests that road agencies are spending their limited transportation funds on the parts of the system that carry the majority of traffic.

## **BRIDGE CONDITION**

# National Bridge Inventory (NBI)

Bridges have their own federal rating system. These classifications are determined by the National Bridge Inventory (NBI) database. Federal law requires that bridges be inspected at least once every two years. Condition ratings are based on a 0-9 scale and assigned for each culvert or the superstructure, the substructure, and the deck of each bridge. A condition of 4 or less classifies the bridge as being in "poor" condition.

Structurally Deficient: Generally, a bridge is structurally deficient if any major component is in "poor" condition. If any one or more of the following are true, then the bridge is structurally deficient.

- $\triangleright$ Deck Rating is less than 5
- Superstructure Rating is less than 5
- Substructure Rating is less than 5
- Culvert Rating is less than 5
- Structural Evaluation is less than 3

For the purpose of this report, the 2012 NBI ratings will be classified into Good (NBI Rating 7-9), Fair (NBI Rating 5-6), Poor (NBI Rating 0-4) categories, much like the ones used for pavement condition.

### **Bridges**

An analysis of bridge conditions in Michigan shows that state and local 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. This can be attributed to:

- 1. Progress being made 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.

Federal guidelines classify bridges as structurally deficient if at least one of three key bridge components (deck, superstructure, or substructure) is rated in poor condition. This means that qualified engineers have determined that the bridge requires significant maintenance, rehabilitation or replacement. A structurally deficient bridge may need to have heavy vehicle traffic restricted or eventually be closed until necessary repairs can be completed.

Bridge conditions in Michigan have been given even more of a strategic focus with the development of the MiDashboard, Governor Snyder's set of high level performance measures indicating how the state compares with the rest of the nation in key result areas, along with recent trends. 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: www.michigan.gov/midashboard



# 2012 Percent Structurally Deficient Bridges All Highway Bridges (Great Lakes States)

However, there remains reason for continued concern regarding Michigan's ability to preserve its strategic bridge assets. Figure 2 above indicates that Michigan has a significantly higher percentage of structurally deficient bridges than other Great-Lakes states. An analysis of the 2012 NBI submittal shows that 4.9 percent of state-owned bridges and 15.9 percent of county and local bridges were structurally deficient, resulting in Michigan having 11.4 percent of all highway bridges structurally deficient.



# 2004 - 2012 Bridge Condition All Roadway Bridges (MDOT and Local Agency)

Source: MDOT March 2013 Figure 20

Figure 20 above compares the percentage of Michigan bridges in good, fair, and poor condition for the years 2004-2012. Michigan state and local 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 good and fair categories is increasing, without implementing an effective preventative maintenance strategy those bridges located on the fair to poor border-line are in danger of dropping into the poor category.



2009 - 2012 Local Condition Trend

Figure 21 above the data show that local bridge owners have maintained the number of poor bridges over the last nine-years. It is important to apply strategic preventative maintenance strategies so that the number of fair bridges approaching the poor category (NBI Rating <5).



2009 - 2012 Trunkline Condition Trend

Figure 22 above the data show the trunkline system has made significant progress in reducing poor bridges, accounting for most of the progress statewide. Additionally, the trunkline system has maintained the number of fair bridges before they reach the poor category, while increasing the number of good and fair bridges. Maintaining or improving the bridges rated is imperative to prevent the number of poor bridges (NBI Rating <5) from increasing.

# NINE YEAR TREND ANALYSIS - CYCLE OF LIFE

## Roads

Figure 23 below shows that 45.2 percent of Michigan's roads have improved/deteriorated over the last nine years (2004 - 2012). During that period, 15.4 percent of the roads went from good to fair, 23.9 percent went from fair to poor, and 5.9 percent slid all the way from good to poor. In that same nine year period, only 17.5 percent of the roads were improved; 10.9 percent went from fair to good, 3.5 percent went from poor to fair and 3.1 percent went from poor to good.



Source: TAMC 2004 - 2012 PASER Data Collection Figure 23

#### Bridges

Figure 24 below shows the percentage of bridges that have improved/deteriorated into each of the major condition categories over the last nine years (2004 - 2012). Michigan's overall goal is to reduce the number of poor bridges. Over this time span, 19 percent of Michigan's bridges have deteriorated; 12.5 percent of the bridges went from good to fair, 5.8 percent went from fair to poor, and 1 percent slid all the way from good to poor. In that same nine year period, 18.1 percent of the bridges were improved; 7.2 percent went from fair to good, 3.9 percent went from poor to fair and 7 percent went from poor to good.



Source: Michigan Bridge Database (March 2013) All Michigan Highway Bridges Figure 24

#### FORECASTED SYSTEM CONDITION

#### **Road** Condition

Forecasts for statewide road condition, assuming current funding trends, indicate a continuation of the trend reported for the past nine years. Given current funding levels, the percentage of roads rated in good or fair condition will probably decrease dramatically over the next ten years.

Forecast of Pavement Condition - 2013 to 2023



Source: MDOT March 2012 Figure 25

Figure 25 above is a graph of past, present, and future pavement condition. It shows the probable condition of paved federal-aid roads for the next ten years if current trends continue. Each point on the graph represents the percentage of roads in good or fair condition. The first seven points on the graph show the actual pavement condition for the years 2006 to 2012; the remaining data points show the forecasted pavement condition. Each forecast year is represented by two points. The points represented by a blue diamond were derived from a trend-line analysis based on pavement conditions in 2006 to 2012. The points represented by a white diamond were derived from a Markovian model that uses multiple variables, such as historical pavement data, pavement management strategies, and revenues available for construction and maintenance. The results of the two models are remarkably similar: they show a continuous trend of worsening pavement conditions over the next ten years.

#### **Bridge Condition**

Working from current bridge condition information (National Bridge Inventory 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 26 above indicates the combined overall bridge condition of all the state's bridges (Trunkline and local agency) is expected to decline after 2012 unless additional funding is identified for both state and local bridge programs. In addition, the condition and forecast data shows the local bridge program could materially benefit from applying capital preventative maintenance strategies.

# **INVESTMENTS IN THE SYSTEM**

		1		1			
		200	4	20	12		
Condition	I.	County, City, State Non-Freeway	Freeway	County, City, State Non-Freeway	Freeway		
Fair	Percent	65.0%	61.0%	45.8%	62.6%		
	Lane Miles	53,844	6,122	33,813	6,275		
	CPM %	100%	100%	100%	100%		
	CPM cost/In.mi.	\$28,000	\$42,000	\$43,981	\$66,600		
	Total Need in Fair Cond.	\$1,507,632,000	\$257,124,000	\$1,487,139,405	\$417,916,598		
Poor	Percent	10.8%	6.4%	36.6%	8.3%		
	Lane Miles	8,915	646	27,021	830		
	Reabilitation %	70%	70%	70%	70%		
	Rehab. cost∤ In.mi.	\$100,000	\$335,000	\$125,000	\$423,000		
	Rehab. Sub Total	\$624,050,000	\$151,487,000	\$2,364,341,700	\$245,641,328		
	Reconstruction %	30%	30%	30%	30%		
	Reconst. cost/In.mi	\$360,000	\$930,000	\$590,102	\$1,456,000		
	Reconst. Sub Total	\$962,820,000	\$180,234,000	\$4,783,552,340	\$362,364,513		
	Total Need in Poor Cond.	\$1,586,870,000	\$1,586,870,000 \$331,721,000		\$608,005,841		
	Total Fair and Poor Cond.	\$3,094,502,000	\$588,845,000	\$8,635,033,445	\$1,025,922,439		
	Grand Total	\$3,683,3	47,000	\$9,660,	955,884		
	Reduction in As	sset Value 2004 t	to 2012	\$5,977,6	508,884		
	Source: TAMC Date: March 2013						

Cost of Returning Paved, Federal-Aid Roads to Their 2004 Condition

ource: TAMC Date: March 201 Figure 27

# Cost of Deterioration

The costs of this continued deterioration are significant. Figure 27 above shows that in 2004 the Council projected it would have cost approximately \$3.7 billion to bring all federal-aid roads rated poor and fair up to a good rating. In 2012, the Council projects it would have cost \$9.6 billion, more than triple what it would have cost in 2004. This represents \$5.9 billion in lost value of our road assets. The adoption of good pavement and asset management practices by all road agencies can help check this deterioration and the resulting loss of value, but without adequate funding these practices by themselves will be insufficient to fix this situation.

# **APPENDIX A:**

# Michigan's Roads Crisis: What Will It Cost to Maintain Our Roads and Bridges? 2013 Update

Rick Olson March 10, 2013

As a member of the House Transportation Committee Work Group on Transportation Funding, we made the following findings and conclusions in September, 2011.

"House Transportation Committee Work Group. The September, 2011 report

"<u>Michigan's Road Crisis: What Will It Take to Maintain Our Roads and Bridges?</u>" reported on what it would take to just preserve our existing road surfaces and bridges and achieve over a 12 year period 95% of the freeways and 85% of all other paved roads in the state at a "good" or "fair" condition. It found that it would take an investment of **at least \$1.4 billion** more per year than current spending. The study used the asset management approach of what would be the least cost long-term combination of "fixes" and timing of fixes to maintaining the value of the state's assets of roads and bridges – a business approach. This approach emphasizes doing the capital preventive maintenance to avoid the much higher cost "fixes" of rehabilitation or reconstruction necessary much sooner in the road life than if the capital preventive maintenance is not done." <u>Michigan's Road Crisis: What Will It Take to Maintain Our Roads and Bridges? 2012 Update</u>

Because new and more expanded data were available in March, 2012, <u>Michigan's Road Crisis:</u> <u>What Will It Take to Maintain Our Roads and Bridges? 2012 Update was prepared</u>, which found:

- 1. We need at least \$1.542 additional funding or savings to maintain our roads and bridges and achieve the 95%/85% good or fair condition in the next 12 years.
- 2. To avoid another \$1.8 billion cost to the taxpayers caused by delay, action needs to be taken timely in 2012 to avoid missing the 2013 construction year as well. Time is not on our side.

(These findings and conclusions, and those of several other transportation funding studies may be found at Transportation Funding Findings and Conclusions, http://ourmiroads.com/findings%20and%20conclusions.html)

Another year has passed and the 2013 construction year appears to be lost to additional funding. 2012 road condition data has become available, so Jim Ashman and Gil Chesbro from MDOT have rerun the model to see what, if anything has changed.

**2013 Findings and conclusions:** The amount of additional funding the State of Michigan needs to just preserve our existing road surfaces and bridges and achieve over a 12 year period 95% of the freeways and 85% of all other paved roads in the state at a "good" or "fair" condition has risen to **\$1.754 billion**, up from \$1.542 billion just a year earlier. The cost of delay from the legislature taking no action in 2012 to 2013 has been **\$2.219 billion**.

The Michigan Transportation Asset Management Council has provided the following bar charts on the paved road conditions in Michigan from 2004 - 2012. The Federal Aid roads saw a small decline in the percentage in good condition from year to year, a small increase in the percentage of roads in fair condition and a small decrease in the quality of roads in poor condition.

While the data show a slight 1.5 percent decrease in the number of roads rated in poor condition between 2011/12, one out of every three miles of road on the federal-aid eligible road system remain rated in poor condition. This slight decrease may be due to a variety of factors. This includes completed improvement projects associated with the one-time federal American Recovery & Reinvestment Act (ARRA). The decrease may also be attributable to the unusually mild winter of 2011/12, which allowed remaining funds for winter maintenance to be used for road improvements. Though welcome news, there is not sufficient evidence to suggest that the downward trend in road condition is reversing itself; in fact, the Council projects that the situation will only get worse in the coming years.



# **Michigan Federal Aid Roads**

Fair

Good

Poor

The Non-Federal Aid roads are in worse condition, but did see a small increase in the percentage of roads in good condition, while seeing a significant reduction in the roads rated fair and an increase in the percentage rated poor. The following graph shows more specifically, on the 1-10 scale the non-federal aid roads.



#### Michigan Non-Federal Aid Roads

Ashman and Chesbro reran the same model used in 2011 and 2012 to project how much it would take to maintain our state's roads, with the goal to reach and maintain a road condition where 95% of our state's freeways would be rated good or fair, while all other paved roads in the state being 85% good or fair. The amount of "current budget" allocated to projects was held constant. The "carveouts" from the gross revenue going into the State Transportation Fund was assumed constant, as were the amounts expected from the federal government, the payments on the transportation bonds and the cost of construction. Some of these assumptions may prove to be optimistic, but the attempt was to be able to compare the years' road conditions apples to apples.

#### 2011 vs 2012

Funds Needed (annual average in millions)						
	2011 Data	2012 Data	Difference	Increase		
Freeway	\$643	\$676	\$33	5.1%		
Federal Aid, Trunkline	\$739	\$775	\$36	4.9%		
Federal Aid, Non-Trunkline	\$1,108	\$1,166	\$58	5.2%		
Non-Federal Aid	\$665	\$792	\$127	19.1%		
Total	\$3,155	\$3,409	\$254	8.1%		

The chart above looks only at the roads, ignoring bridges for the moment. It shows that the funds needed grew \$254 million as an average over the 12 years compared with the 2012 calculations based on the 2011 road condition date. Ashman and Chesbro also provided this summary, showing the results over the 2014-2025 period.

2014-2025 Funds Needed to Achieve Condition Goal									
	Goal Funds Needed Current Budget Shortfall								
	Paved Lane Miles	Percentage in Good/Fair Condition	Ar	nnual Average in Millio	ons				
Freeway	10,024	95%	\$676	\$148	\$528				
Non-Freeway Trunkline	19,432	85%	\$775	\$317	\$458				
Federal Aid, Non-Trunkline	54,396	85%	\$1,166	\$378	\$788				
Non-Federal Aid	79,482	85%	\$792	\$254	\$538				
Road Subtotal	163,334	86%	\$3,409	\$1,097	\$2,312				

#### Summary of Model Runs Using 2012 Condition Data

Of perhaps greater interest, however, is the total for both roads and bridges, on an annual basis. The following table shows the amount of additional funding needed is \$1.754 billion in 2014 and growing to \$3.428 billion in 2025 (using a 5% cost of construction inflation factor).

#### All Roads & Bridges (\$ in millions)

Year	Total Funds Needed to Meet Goals	Additional Funding Above Current Investment Needed to Meet and Sustain Goals	Year	Total Funds Needed to Meet Goals	Current Budget	Additional Funding Above Current Investment Needed to Meet and Sustain Goals	Increase in Shortfall	Year	Total Funds Needed to Meet Goals	Current Budget	Additional Funding Above Current Investment Needed to Meet and Sustain Goals	Increase in Shortfall
					201	2 Study				2013	Study	
	2011 Study F	Results				Results				R	lesults	
2012	\$2,703	\$1,377	2013	\$2,868	\$1,326	\$1,542	\$164.87	2014	\$3,080	\$1,326	\$1,754	\$212
2013	\$2,688	\$1,362	2014	\$2,872	\$1,326	\$1,546	\$184.32	2015	\$3,071	\$1,326	\$1,745	\$199
2014	\$2,692	\$1,366	2015	\$2,868	\$1,326	\$1,542	\$176.08	2016	\$3,148	\$1,326	\$1,822	\$280
2015	\$2,688	\$1,362	2016	\$2,949	\$1,326	\$1,623	\$260.54	2017	\$3,232	\$1,326	\$1,906	\$283
2016	\$2,834	\$1,508	2017	\$3,180	\$1,326	\$1,854	\$345.75	2018	\$3,414	\$1,326	\$2,087	\$233
2017	\$3,060	\$1,733	2018	\$3,330	\$1,326	\$2,004	\$270.90	2019	\$3,548	\$1,326	\$2,221	\$217
2018	\$3,203	\$1,877	2019	\$3,478	\$1,326	\$2,152	\$275.16	2020	\$3,725	\$1,326	\$2,399	\$247
2019	\$3,344	\$2,019	2020	\$3,643	\$1,326	\$2,318	\$299.39	2021	\$3,911	\$1,326	\$2,585	\$267
2020	\$3,504	\$2,178	2021	\$3,706	\$1,327	\$2,379	\$201.20	2022	\$4,106	\$1,327	\$2,780	\$401
2021	\$3,559	\$2,232	2022	\$3,861	\$1,325	\$2,536	\$304.23	2023	\$4,313	\$1,325	\$2,986	\$450
2022	\$3,707	\$2,382	2023	\$4,058	\$1,327	\$2,731	\$349.24	2024	\$4,527	\$1,327	\$3,201	\$470
2023	\$3,896	\$2,569	2024	\$4,250	\$1,326	\$2,924	\$354.60	2025	\$4,754	\$1,326	\$3,428	\$504
			2025	\$4,460	\$1,326	\$3,134						
ar Tota	\$37,878.31	\$21,964.72	Total	\$41,063	\$17,240	\$25,151	\$3,186			\$17,240	\$28,912	\$3,761
			Less	s 2012 Inci	ease Avoi	ded by Delay	\$1,377					
	12 Ye	ar Increase i	n Cost I	Due to Del	ay in Legis	slative Action	\$1,809					
								L	ess 2013	Increase A	volded by	\$1 542
	Year 2012 2013 2014 2015 2016 2017 2018 2020 2021 2022 2023 2023 2023	Total Funds Needed to Meet Goals     2011 Study F     2012   \$2,703     2013   \$2,688     2014   \$2,692     2015   \$2,688     2016   \$2,834     2017   \$3,060     2018   \$3,203     2019   \$3,344     2020   \$3,504     2021   \$3,559     2022   \$3,707     2023   \$3,896     car Total   \$37,878.31	Additional Funding Above Current Needed to Needed to Needed to Needed to Needed to Sustain Goals     Total Funds Needed to Sustain Goals     Vear   Meet and Sustain Goals     2012   \$2,703     \$2012   \$2,703     \$2012   \$2,703     \$2012   \$2,688     \$2014   \$2,692     \$2015   \$2,688     \$2015   \$2,688     \$2016   \$2,834     \$2017   \$3,060     \$1,733   \$1,877     \$2018   \$3,203     \$1,817   \$2019     \$2021   \$3,504     \$2,178   \$2,232     \$2022   \$3,707     \$2,382   \$2,569     Current   \$3,896     \$2,569   \$2,569	Additional Funding Above Current Investment Needed to   Adoitional Funding Above Current     Total Funds Needed to   Meet and Sustain Goals   Year     2012   \$2,703   \$1,377   2013     2012   \$2,703   \$1,377   2013     2013   \$2,688   \$1,362   2014     2014   \$2,692   \$1,366   2015     2015   \$2,688   \$1,362   2016     2016   \$2,834   \$1,508   2017     2017   \$3,060   \$1,733   2018     2018   \$3,203   \$1,877   2019     2021   \$3,559   \$2,232   2022     2021   \$3,559   \$2,232   2022     2022   \$3,707   \$2,382   2023     2023   \$3,896   \$2,569   2024     2025   \$2,768.31   \$21,964.72   Total     2020   \$3,787.831   \$21,964.72   Total	Additional Funding Above Current Investment Needed to Needed to Needed to Sustain Year Total Funds Needed to Needed to Sustain Qals Total Funds Year   2012 \$2,703 \$1,377 2013 \$2,868   2013 \$2,688 \$1,362 2014 \$2,872   2014 \$2,692 \$1,366 2015 \$2,868   2015 \$2,688 \$1,362 2016 \$2,949   2016 \$2,834 \$1,508 2017 \$3,180   2017 \$3,060 \$1,733 2018 \$3,330   2018 \$3,203 \$1,877 2019 \$3,478   2019 \$3,344 \$2,019 2020 \$3,643   2021 \$3,559 \$2,232 2022 \$3,861   2022 \$3,707 \$2,382 2023 \$4,058   2023 \$3,896 \$2,569 2024 \$4,250   2024 \$3,583 \$2,269 2024 \$4,250   2023 \$3,896 \$2,569 2024 \$4,063   2024 \$3,578,78,31 \$21,964,72 Total \$41,063   2025 \$4,460 <t< td=""><td>Additional Funding Above Current Total Funds Needed to Needed to Total Funds Funds Total Needed to Sustain Total Funds Current Budget   Year Total Funds Meet and Sustain Needed Goals Needed Goals Current Budget   Year Statin Total Sustain Needed Goals Sustain Needed Goals Current Budget   2012 \$2,703 \$1,377 2013 \$2,868 \$1,326   2013 \$2,688 \$1,362 2014 \$2,872 \$1,326   2014 \$2,692 \$1,366 2015 \$2,868 \$1,326   2015 \$2,688 \$1,362 2016 \$2,949 \$1,326   2014 \$2,692 \$1,366 2017 \$3,180 \$1,326   2015 \$2,688 \$1,362 2016 \$2,949 \$1,326   2016 \$2,834 \$1,052 2017 \$3,180 \$1,326   2019 \$3,344 \$2,019 2020 \$3,641 \$1,326   2021 \$3,559 \$2,232 2022 \$3,614 \$1,326   2022 \$3,707 \$2,382 20</td><td>Additional Funding Above Current Additional Funding Above Current Additional Funding Above Current   Total Funds Needed to Year Meet and Sustain Goals Needed to Meet Goals Investment Needed to Funds Investment Needed to Sustain   Year Total Funds Meet and Sustain Needed to Meet Goals Needed to Meet Budget Meet and Sustain Goals   2012 \$2,703 \$1,377 2013 \$2,868 \$1,326 \$1,542   2013 \$2,688 \$1,362 2014 \$2,872 \$1,326 \$1,542   2014 \$2,692 \$1,366 2015 \$2,868 \$1,326 \$1,542   2015 \$2,688 \$1,362 2016 \$2,949 \$1,326 \$1,542   2016 \$2,834 \$1,508 2017 \$3,180 \$1,326 \$1,623   2017 \$3,060 \$1,733 2018 \$3,330 \$1,326 \$2,152   2019 \$3,344 \$2,019 2020 \$3,643 \$1,326 \$2,379   2021 \$3,559 \$2,232 2022 \$3,614 \$1,326 \$2,379   2022 \$3,707 \$2,382 2023<!--</td--><td>Additional Funding Above Current Additional Funding Above Current Additional Funding Above Current   Investment Needed to Year Total Needed to Needed to Year Total Funds Needed to Needed to 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12 Year Increase in Cost Due to Delay in Legislative Action \$2,219 (Note this table adds in the results of the model estimating the amount of additional funding for bridges calculated in 2011, but the 2011 results are incorporated into the current estimate due to little, if any, change in the condition of the state's bridges in the two years.)

Perhaps as equally alarming as the increase in the annual cost is the cost of delay. While the cost of delay from 2011 to 2012 was estimated at \$1.809 billion, the cost of delay from 2012 to 2013 is now estimated at \$2.219 billion. The conclusion a year ago that "time is not on our side" has been reinforced.

#### Additional Conclusions:

1. The \$1.2 billion of funding requested by Governor Snyder (plus \$280 million assumed to be raised by local governments through the proposed optional vehicle registration fee the locals could impose) undershoots the mark. Another previous run of the model found that just to maintain our current low quality roads would take over \$1 billion additional revenue. <u>http://ourmiroads.com/findings%20and%20conclusions.html</u> The \$280 million of additional local money is very speculative, especially if one of the sources of the additional revenue at the state level is increased vehicle registration fees.

2. The model assumes that all of the additional revenue goes to roads and bridges, and no additional dollars for any of the carveouts in Act 51, including the transfer to the Comprehensive Transportation Fund, which supports public transportation. This does not mean that no additional money is wanted or needed for public transportation, but it does mean that if any of the additional money is to go to public transportation, the \$1.754 billion needs to be higher to account for that leakage.

3. The model does not assume any additional money for any mega projects, such as the reconstruction of I 94 and 75 in the Metro Detroit area, nor any additional for safety improvements, capacity improvements, intelligent transportation system components (digital signage and the like), etc. That is, no money for these kinds of program beyond what can already be planned for in the Five Year Transportation Plan using existing revenue.

4. The model assumes that the money is spent in the most efficient manner, using the asset management approach of pavement preservation. http://ourmiroads.com/asset\_management.html This goal is not always possible, which leads to the conclusion that we need at least an additional \$1.742 billion, and we cannot assume away a portion of the amount needed by "increased efficiency" using asset management. We need both: additional funding and the practice of asset management.

5. The legislature might choose to lower the goal of achieving 85% of the non-trunkline federal aid roads and the non-federal aid roads to become good or fair by 2025. Previous calculations have shown that this would reduce the need from \$100 million in the early years to \$150 twelve years later.

6. Assuming that all additional funding goes to roads and bridges, and current revenues are allocated as done currently, the funding allocation suggested by the model is as follows:

Road Category	Millions		Percentage
Trunkline Freeways	430.50		
Non-Freeway Trunkline	360.72		
Total Trunkline		791.22	45%
Remainder Federal Aid	542.00		
Non-Federal Aid	371.00		
Local Total		913.00	52%
Bridges	50.00		3%
	1,754.22		100%

7. The models assumes we wish to achieve the goal of 95% of our state's freeways and 85% of the remainder of the state's paved roads in good or fair condition. Even with the additional funding, the improvement will not be instantaneous. We did not get in this condition overnight, and we will not get out of this condition overnight, but we must start now.

Here are the projections from the model showing the improvement.



Note that there will actually be a dip in average quality of the non-freeway trunkline highways, before we see a gradual improvement. There is a limit on how many roads we can work on each year without causing too much congestion.





Source of all charts: Ashman & Chesbro, MDOT/Michigan Transportation Asset Management Council, February 26, 2013

8. When we are talking about the roads being in "good" or "fair" condition, we are not talking about having our roads in pristine condition. Here are photos of roads in "fair" condition, Paser ratings 5 and 6.











### **APPENDIX B:**

# Center for Technology & Training

MichiganTech

**Transportation Institute** 

"Meeting our transportation needs through innovative research, distinctive educational programs, technology transfer, and workforce development."

Prepared By: Michigan Tech Center for Technology & Training Michigan Technological University 1400 Townsend Drive

# 2012 TAMC Training Program Results

Submitted: January 2013

Authors: Tim Colling, Ph.D, P.E. Melanie Kueber Watkins, P.E. John Kiefer, P.E.

# Table of Contents

2012 Introduction to Asset Management for Elected Officials	3
2012 Asset Management Workshop	6
2012 Asset Management Conferences	7
2012 PASER Training	
2012 Enrollment	13
Appendix A – Evaluations from the 2012 Asset Management Workshops	
Appendix B – Evaluations from the 2012 Asset Management Conference	17
Appendix C - Local Agency Attendance in TAMC Training Programs by Agency 2007-2012	
Appendix D - Local Agency Attendance in TAMC Training Programs by Agency 2007-2012	
Appendix E – PASER Certification Policy	20
Appendix F – Press Release, Asset Management for Elected Officials, City of Rogers City	

# Figures

Figure 1. Agency attendance for Introduction to Asset Management for Elected Officials	3
Figure 2. Participation by position for Introduction to Asset Management for Elected Officials based on workshop survey results.	5
Figure 3. Participation by agency for Asset Management Workshops	6
Figure 4. Participation by agency for Asset Management Conferences	7
Figure 5. Participants by location for the Asset Management Conference in Livonia, MI.	8
Figure 6. Participants by location for the Asset Management Conference in Marquette, MI.	9
Figure 7. Agency participation in on-site PASER Training.	10
Figure 8. Participation by agency attending in the web-based PASER Training.	11
Figure 9. Total historical participation in TAMC training by event.	14
Figure 10. Total historical participation in TAMC training by percentage of agency type	14
Figure 11. Location of Introduction to Asset Management for Elected Officials events by county	15

# Tables

Table 1. 2012 Scheduled Introduction to Asset Management for Elected Officials Workshop	ps5
Table 2. Notified candidates.	
Table 3. PASER Certification 2012 Results.	

Ten workshops on *Introduction to Asset Management for Elected Officials* were held in 2012 and had attendance of 215 total participants, which is a 19% increase from 2011 when 180 participants attended. There were an additional 26 people total that registered for a workshop session but did not attend; this is a relatively low number of "no shows" representing about 11% of the total registered. Attendance by agency type is shown in Figure 1.





Introduction to Asset Management for Elected Officials workshops were held at the following locations:

1/17/12 - Kawkawlin 1/18/12 - Corunna 1/19/12 - Saint Clair 1/24/12 - Caro 1/25/12 - Hastings 4/26/12 - Livonia 5/02/12 - Lawrence 5/03/12 - Jackson 6/12/12 - Rogers City 11/1/12 - Mikado

Rogers City had a total of 31 workshop participants, the second highest participant turnout of all workshops held in 2012. The total attendance of all sessions held in 2012 was 215. The above average attendance at the Rogers City workshop was chiefly due to the promotional activities done by Toby Kuznicki, the Engineering & Zoning Assistant for the City of Rogers City. Mr. Kuznicki provided a list of the activities they did to promote the workshop. This list could be used by agencies to increase attendance:

 Pick a location that local people know. People are more likely to attend if they know the location and are comfortable with it. Schedule the event in the late afternoon / early evening to allow people who work during the day to attend.

- Person to person contact with the staff from the hosting agency with peers in other agencies on the surrounding are seems to work best with encouraging attendance.
- Opening up the program to concerned citizens (not just elected and appointed officials), allows the message to be spread further into the community which eases the elected/appointed official's job by convincing community members of the value of asset management.
- Post a color copy of the event flyer on the local public access cable channel or in the local newspaper about two weeks out prior to the event.
- Two to three weeks prior, an invitation to attend should be mailed to all the surrounding local governments.
- 6. One week prior to the event all invitees were called personally to ask if they were going to attend. The agency should try to get a verbal commitment to attend by participants on the phone. Three days prior to the workshop date issue a press release to local papers including the basic information the date, time, event name, invitation to attend no charge, contact information. Talk to the local papers and provided more information as needed and ask for their support to publicize the educational event.
- 7. Post a sign on the building so visitors can find the event.
- 8. Three days prior to the workshop date issue a press release to local papers including the basic information the date, time, event name, invitation to attend, no fee to attend, and contact information. The host agency should talk to the local papers and provided more information as needed and ask for their support to publicize the educational event. (The press release and newspaper article for the Rogers City Transportation Asset Management Workshop are in Appendix F.)
- 9. Post a sign on the building so visitors can find the event.

During the workshops participants were given pre-workshop and post-workshop surveys which asked some basic questions regarding their demographics, contained a basic learning assessment, and provided a place for feedback. A total of 159 pre- and post-workshop surveys were collected. Participants represented cities, consultants, counties, road commissions, townships, and villages in Michigan. Positions of participants included appointed officials, building/zoning officials, city management, commissioners, elected officials, engineers, managers, citizens, technical and support staff, village administrators and managers, and foremen. The percentages of each position that participated in the survey are shown in Figure 2. Survey results indicate that this workshop is reaching the target audience of primarily local agency elected and appointed officials. The attendance data shows that there is also a number (19%) of technical staff that attends these training events, presumably to hear the message delivered to the elected /appointed officials and to show support for asset management processes within their agency.



From the pre-workshop survey, of the 159 survey respondents when asked:

"Prior to workshop, did you understand what the TAMC was?"

- 53% of participants (84) indicated 'No.'
- 44% of participants (70) indicated 'Yes.'
- · 1% of participants (1) wrote in 'Not Sure.'
- 1% of participants (1) wrote in 'Some or Somewhat.'
- 1% of participants (1) wrote in 'Both Yes & No.'
- 1% of participants (2) did not answer.

"Do you have control over or influence on the types and locations of road projects that your agency undertakes?"

- 80% of participants (127) indicated 'Yes.'
- 11% of participants (17) indicated 'No.'
- 1% of participants (2) wrote in 'Both Yes & No.'
- 1% of participants (2) wrote in 'Some or Somewhat.'
- 7% of participants (11) did not answer.

Additional learning assessment questions were given to the participants before and after the workshop. These questions were the same in both the pre and post assessments and pertained to pavement maintenance and management. Participant's correct scores were tabulated for the pre and post survey. Correct answers increased from 65% prior to the training event to 72% correct after attending the workshop indicating that the majority of participants learned from the workshop.

Interest in hosting these training sessions has been high during 2012. All of the budgeted slots for 2012 were completed and additional *Introduction to Asset Management for Elected Officials* workshops have been scheduled for January 2013 based on interest in 2012 (see Table 1). Agencies have begun advertisement and registration conducted by the Center for Technology & Training is underway for these sessions.

Date	Time	Location	Contact
January 7, 2013	TBD	Roscommon CRC	Tim O'Rourke, Manager
January 10, 2013	TBD	Moran Township	Kristine Vallier, Moran Township Clerk
February 19, 2013	9 am to noon	Kalamazoo CRC	Joanna Johnson, Managing Director
February 20, 2013	TBD	Kent CRC	Wayne Harrall, Director of Engineering
February 21, 2013	TBD	City of Charlotte	Amy Schoonover, Director, Department of
			Public Works

Table 1. 2012 Scheduled Introduction to Asset Management for Elected Officials Workshops.

Five Asset Management Workshops were held in 2012 with a total of 73 total participants. This represents a slight decrease from 2011 when total enrollment was 84 people. Nine people registered but did not attend. Participation by agency type is shown in Figure 3.



Figure 3. Participation by agency for Asset Management Workshops.

The PowerPoint modules used during the 2012 workshop sessions were revised from previous years by adding sections on performance management and asset management plans. The Asset Management Guide for Local Agencies in Michigan, which is the companion guide to the workshops, has not been updated since 2007. The guide needs to be updated to be consistent with the training and to take into account current information. Guide updates will be completed by CTT in 2013 under the Undefined Development task in the CTT work plan.

Asset Management Workshops were held at the following locations in 2012:

10/30/2012 - Livonia 10/31/2012 - Lansing 11/1/2012 - Grand Rapids 12/5/2012 - Mt. Pleasant 12/6/2012 - Traverse City

Five people from Indiana attended the Mt. Pleasant workshop. Three of the attendees were from Lake County Indiana and two were technical staff from the Indiana LTAP. The Indiana participants indicated that they were interested in starting asset management with the counties and municipalities in their home state. They also indicated that Indiana LTAP had been using exercises and other training material from the Asset Management Guide for Local Agencies in Michigan at various local agency meetings throughout the year to introduce the concept of asset management. The Indiana LTAP staff was given copies of the training materials to take back for their own use. The Indiana participants indicated that they would likely seek support and guidance from the Michigan TAMC in starting asset management in their home state.

Participant evaluations from the Asset Management Workshops are included in Appendix A. The vast majority of the comments from participants as well as evaluation results were very positive.

#### 2012 Asset Management Conferences

Two Asset Management Conferences were held in 2012 and had 148 total participants. This represents steady participation compared to 2011 when total enrollment was 146. Four people registered for one of the conference sessions but did not attend. Participation by agency type is shown in Figure 4. Participation data indicates that there is an almost even split between local agency and state agency participation, with very similar attendance patterns from previous years.



Figure 4. Participation by agency for Asset Management Conferences.

Participation at the Asset Management Conference appears to be strongly influenced by the region in which the training is held. This is evident by the clustering of attendees from around the conference sites of Livonia and Marquette. Figures 5 and 6 show the location where Asset Management Conference attendees are from in the state. Evaluations for each of the presenters at the conference are included as Appendix B.



Figure 5. Participants by location for the Asset Management Conference in Livonia, MI.

An online interactive map of this data is available at: http://batchgeo.com/map/bd855c9077548af3a1e17c67f0be25d8

The maps shown in Figure 5 and Figure 6 cluster participants into generic regions based on the proximity of their address. The interactive maps allow zooming for further evaluation of participant clustering and illustration of exact locations of agencies attending the conference.



Figure 6. Participants by location for the Asset Management Conference in Marquette, MI.

An online interactive map of this data is available at: http://batchgeo.com/map/802528b86c3f787843e56ad399476433 Ten on-site *PASER Training* workshops were held in 2012 and had 416 total participants, which represents an increase from 2011 when total enrollment was 392. There were 43 people that registered for a workshop session but did not attend. Participation by agency type is shown in Figure 7.



Figure 7. Agency participation in on-site PASER Training.

PASER Training was held at the following locations:

2/28/12 - West Branch 2/29/12 - Saginaw 3/1/12 - Grand Rapids 3/27/12 - Kalamazoo 3/28/12 - Lansing 3/29/12 - Dearborn 4/17/12 - Gaylord 4/18/12 - Escanaba 4/19/12 - Ishpeming 6/7/12 - Mt. Pleasant

Four PASER Training webinars were held in 2012 on 2/21/12, 2/23/12, 3/14/12, and 4/12/12. These sessions were held in advance of the on-site sessions to provide background information on distress identification. The 2012 webinars had 152 total participants, which represents an increase from 2011 when total enrollment was 94. There was 1 person that registered for a session but did not attend. Participation by agency type is shown in Figure 8.



Figure 8. Participation by agency attending in the web-based PASER Training.

During the 2012 PASER Training participants were given a training evaluation and an asset management implementation survey. The results of the implementation survey were presented in the report Asset Management Implementation in Michigan Local Agencies: Survey Results dated July 18, 2012.

Directly following each of the 2012 on site PASER training sessions, eligible candidates could take the TAMC PASER Certification examination to qualify for certification. The policy that TAMC passed relating to certification eligibility and its benefits is located in Appendix E of this report.

Prior to 2012 PASER Training eligibility for taking the certification exam was determined by evaluating participant training records for all on-site PASER Trainings held since 2003. Letters were sent to notify eligible candidates that they qualified to take the certification exam. Letters were also sent to candidates who potentially qualified to take the certification exam based on their experience if they possessed a civil engineering degree. The number of candidates notified in each category is shown in Table 2.

#### Table 2. Notified candidates.

Eligible candidates	121
(6 years of attendance and rating experience)	
Possible candidates	34
(Possible civil engineers with 5 years of attendance and rating experience)	

Since records were not available to verify that all candidates with five years of attendance were civil engineers or years rating the road network, all candidates were asked to verify their eligibility by signing a certification statement on the exam.

At the onsite sessions of *PASER Training*, exams were administered to eligible candidates. Results from the certification exam are shown in Table 3.

# Table 3. PASER Certification 2012 Results.

Total registered for exam	40
Completed and passed	35
No-shows	4
Non-passing	1

#### 2012 Enrollment

Total enrollment in the 2012 TAMC training program was up by approximately 6% over 2011 enrollment, with a total of 852 participants trained in 2012, which is the highest participation in last three years. While the increase in participants over the last year is encouraging, the numbers are still below the 2008 peak in training demand when 979 participants attended TAMC training events. Figure 9 below illustrates total participation in TAMC training programs between 2007 and 2012. Figure 10 illustrates the makeup of training participants by agency. When examining total participation figures for *Introduction to Asset Management for Elected Officials* the number of sessions offered should be considered. The 2012 sessions of *Introduction to Asset Management for Elected Officials* to the year; this is actually higher than the average class size as in 2008 when the total class attendance was near its all time high due to the fact there were 21 sessions delivered that year.

While attendance numbers have been below highs in 2008 and 2009, demand for the training events is still strong. The demand by local agencies to host the *Introduction to Asset Management for Elected Officials* workshops is still strong, with five agencies hosting sessions early in 2012. Figure 11 illustrates the locations of *Introduction to Asset Management for Elected Officials* between 2007 and 2012. While demand to host these workshops has been high it has been difficult for hosting agencies to gain participation from elected and appointed officials. Hosting training locations in relatively remote or rural locations, while necessary, is also likely to hinder attendance numbers.

A running history of local agency (City, Village, Township and County) attendance in TAMC training programs is included as Appendix C. Appendix D includes a summary of the number of local agency staff by agency that has attended the TAMC training programs between 2007 and 2012. Data from Appendix C and D are divided by townships, counties, the 40 largest cities and all other cities and villages.



Figure 9. Total historical participation in TAMC training by event.



Training Participants at TAMC Training By %

Figure 10. Total historical participation in TAMC training by percentage of agency type.





#### **APPENDIX C:**

#### STATE TRUNKLINE HIGHWAY SYSTEM (EXCERPT) Act 51 of 1951

As Amended by Act No. 199 Public Acts of 2007

247.659a Definitions; transportation asset management council; creation; charge; membership; appointments; staff and technical assistance; requirements and procedures; technical advisory panel; multiyear program; funding; records on road and bridge work performed and funds expended; report.

Sec. 9a. (1) As used in this section:

(a) "Asset management" means an ongoing process of maintaining, upgrading, and operating physical assets cost-effectively, based on a continuous physical inventory and condition assessment.

(b) "Bridge" means a structure including supports erected over a depression or an obstruction, such as water, a highway, or a railway, for the purposes of carrying traffic or other moving loads, and having an opening measuring along the center of the roadway of more than 20 feet between under copings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes where the clear distance between openings is less than 1/2 of the smaller contiguous opening.

(c) "Central storage data agency" means that agency or office chosen by the council where the data collected is stored and maintained.

(d) "Council" means the transportation asset management council created by this section.

(e) "County road commission" means the board of county road commissioners elected or appointed pursuant to section 6 of chapter IV of 1909 PA 283, MCL 224.6, or, in the case of a charter county with a population of 2,000,000 or more with an elected county executive that does not have a board of county road commissioners, the county executive for ministerial functions and the county commission provided for in section 14(1)(d) of 1966 PA 293, MCL 45.514, for legislative functions.

(f) "Department" means the state transportation department.

(g) "Federal-aid eligible" means any public road or bridge that is eligible for federal aid to be spent for the construction, repair, or maintenance of that road or bridge.

(h) "Local road agency" means a county road commission or designated county road agency or city or village that is responsible for the construction or maintenance of public roads within the state under this act.

(i) "Multiyear program" means a compilation of road and bridge projects anticipated to be contracted for by the department or a local road agency during a 3-year period.

The multiyear program shall include a listing of each project to be funded in whole or in part with state or federal funds.

(j) "State planning and development regions" means those agencies required by section 134(b) of title 23 of the United States Code, 23 USC 134, and those agencies established by Executive Directive 1968-1.

(2) In order to provide a coordinated, unified effort by the various roadway agencies within the state, the transportation asset management council is hereby created within the state transportation commission and is charged with advising the commission on a statewide asset management strategy and the processes and necessary tools needed to implement such a strategy beginning with the federal-aid eligible highway system, and once completed, continuing on with the county road and municipal systems, in a cost-effective, efficient manner. Nothing in this section shall prohibit a local road agency from using an asset management process on its nonfederal-aid eligible system. The council shall consist of 10 voting members appointed by the state transportation commission. The council shall include 2 members from the county road association of Michigan, 2 members from the Michigan municipal league, 2 members from the state planning and development regions, 1 member from the Michigan townships association, 1 member from the Michigan association of counties, and 2 members from the department. Nonvoting members shall include 1 person from the agency or office selected as the location for central data storage. Each agency with voting rights shall submit a list of 2 nominees to the state transportation commission from which the appointments shall be made. The Michigan townships association shall submit 1 name, and the Michigan association of counties shall submit 1 name. Names shall be submitted within 30 days after the effective date of the 2002 amendatory act that amended this section. The state transportation commission shall make the appointments within 30 days after receipt of the lists.

(3) The positions for the department shall be permanent. The position of the central data storage agency shall be nonvoting and shall be for as long as the agency continues to serve as the data storage repository. The member from the Michigan association of counties shall be initially appointed for 2 years. The member from the Michigan townships association shall be initially appointed for 3 years. Of the members first appointed from the county road association of Michigan, the Michigan municipal league, and the state planning and development regions, 1 member of each group shall be appointed for 2 years. At the end of the initial appointment, all terms shall be for 3 years. The chairperson shall be selected from among the voting members of the council.

(4) The department shall provide qualified administrative staff and the state planning and development regions shall provide qualified technical assistance to the council.

(5) The council shall develop and present to the state transportation commission for approval within 90 days after the date of the first meeting such procedures and requirements as are necessary for the administration of the asset management process. This shall, at a minimum, include the areas of training, data storage and collection, reporting, development of a multiyear program, budgeting and funding, and other issues related to asset management that may arise from time to time. All quality control standards and protocols shall, at a minimum, be consistent with any existing federal requirements and regulations and existing government accounting standards.

(6) The council may appoint a technical advisory panel whose members shall be representatives from the transportation construction associations and related transportation road interests. The asset management council shall select members to the technical advisory panel from names submitted by the transportation construction associations and related transportation road interests. The technical advisory panel members shall be appointed for 3 years. The asset management council shall determine the research issues and assign projects to the technical advisory panel to assist in the development of statewide policies. The technical advisory panel's recommendations shall be advisory only and not binding on the asset management council.

(7) The department, each county road commission, and each city and village of this state shall annually submit a report to the transportation asset management council. This report shall include a multiyear program developed through the asset management process described in this section. Projects contained in the department's annual multiyear program shall be consistent with the department's asset management process and shall be reported consistent with categories established by the transportation asset management council. Projects contained in the annual multiyear program of each local road agency shall be reported consistent with the asset management process of each local road agency and shall be reported consistent with categories established by the transportation asset management council.

(8) Funding necessary to support the activities described in this section shall be provided by an annual appropriation from the Michigan transportation fund to the state transportation commission.

(9) The department and each local road agency shall keep accurate and uniform records on all road and bridge work performed and funds expended for the purposes of this section, according to the procedures developed by the council. Each local road agency and the department shall annually report to the council the mileage and condition of the road and bridge system under their jurisdiction and the receipts and disbursements of road and street funds in the manner prescribed by the council, which shall be consistent with any current accounting procedures. An annual report shall be prepared by the staff assigned to the council regarding the results of activities conducted during the preceding year and the expenditure of funds related to the processes and activities identified by the council. The report shall also include an overview of the activities identified for the succeeding year. The council shall submit this report to the state transportation commission, the legislature, and the transportation committees of the house and senate by May 2 of each year.

#### APPENDIX D

#### TRANSPORTATION ASSET MANAGEMENT COUNCIL MEMBERS

**Carmine Palombo, Chair – Michigan Transportation Planners Association:** Carmine is the Director of Transportation Programs for the Southeast Michigan Council of Governments. He has served as the Chair since the Council's first meeting in October 2002.

**Bob D. Slattery, Jr., Vice-Chair – Michigan Municipal League:** Bob is the former Mayor of the City of Mt. Morris and lifetime member of MML. Bob is in his third term on the Council.

**Spencer Nebel – Michigan Municipal League:** Spencer is the City Manager for Sault Ste. Marie. He has been in that position since 1992. Spencer is in his third term on the Council.

William McEntee – County Road Association of Michigan: Bill recently retired as Director of the Permits & Environmental Concerns of the Road Commission for Oakland County. He served in that position since 1992. Bill is in his third term on the Council.

**Steve Warren – County Road Association of Michigan:** Steve is the Deputy Director of the Kent County Road Commission. He has served in that position since 1988. Steve has served on the Council since its first meeting in October 2002.

**Roger Safford - Michigan Department of Transportation:** Roger is the Engineer for the MDOT Grand Region. Roger is in his first term on the Council.

**Dave Wresinski – Michigan Department of Transportation:** Dave is Director of MDOT's Bureau of Transportation Planning. Dave is in his first term on the Council.

**Don Disselkoen – Michigan Association of Counties:** Don currently serves on the Ottawa County Board of Commissioners and represents the 8th district of Ottawa County. Don has served on the Council since its first meeting in October 2002.

John Egelhaaf – Michigan Association of Regions: John has served as the Executive Director of the Southwest Michigan Planning Commission (SWMPC) since 2003. John is in his first term on the Council.

**Jennifer Tubbs – Michigan Townships Association:** Jennifer is the Manager of the Charter Township of Watertown. Jennifer is in her first term on the Council.

**Rob Surber:** Rob is the Deputy Director of the Center for Shared Solutions (CSS), formally the Center for Geographic Information (CGI). The Center serves as the Council's data storage agency and is a non-voting member. Rob has been a member of the council since 2004.

For full bio and contact information, please visit Council's website: <u>www.michigan.gov/tamc</u>

#### APPENDIX E

#### STATE TRANSORTATION COMMISSION & MEMBERS

The State Transportation Commission is the policy-making body for all state transportation programs. It is comprised of six members appointed by the Governor with the advice and consent of the State Senate. Commissioners serve three-year terms, staggered so that the terms of two commissioners expire each year. No more than three Commissioners are from the same political party as required by the State Constitution.

The Commission establishes policy for the Michigan Department of Transportation in relation to transportation programs and facilities and other such works as related to transportation development, as provided by law. Responsibilities of the Commission include the development and implementation of comprehensive transportation plans for the entire state, including aeronautics, bus and rail transit, providing professional and technical assistance, and overseeing the administration of state and federal funds allocated for these programs.

The Office of Commission Audit reports directly to the Commission. The Office of Commission Audit is charged with the overall responsibility to supervise and conduct auditing activities for the Michigan Department of Transportation. The Auditor submits to the Commission reports of financial and operational audits and investigations performed by staff for acceptance. For more information on Commission, please visit MDOT's website: <a href="https://www.michigan.gov/mdot">www.michigan.gov/mdot</a>

#### **COMMISSION MEMBERS:**

Jerrold M. Jung, Chairman – Birmingham; Appointed on September 2, 2007 and reappointed in March 2010 to serve at the discretion of the Governor.

**Todd Wyett, Vice Chairman – Charlevoix and Bloomfield Township;** Appointed on December 21, 2010. His current term will expire on December 21, 2013.

Lynn Afendoulis, Commissioner – Grand Rapids; Appointed on December 28, 2012. Her current term will expire December 21, 2015.

**Charles F. Moser, Commissioner – Drummond Island;** Appointed on December 21, 2010. His current term will expire on December 21, 2013.

Michael D. Hayes, Commissioner – Midland; Appointed on December 28, 2011. His current term will expire on December 21, 2014.

Sharon Rothwell, Commissioner – Ann Arbor; Appointed on December 28, 2011. Her current term will expire on December 21, 2014.

For more information on the Commission, please visit MDOT's website: <u>www.michigan.gov/mdot</u>

#### APPENDIX F

#### **DEFINITION OF TERMS**

<u>Asset Management:</u> as defined in Michigan is "an ongoing process of maintaining, upgrading and operating physical assets cost-effectively, based on a continuous, physical inventory and condition assessment." [MCL 247.659(a)]

**<u>Bridge Replacement:</u>** Removing the old bridge and constructing a new bridge at the same location.

<u>Bridge Recondition or Repair</u>: All types of major repairs including the replacement of the deck.

<u>Capital Preventive Maintenance</u>: Capital preventive maintenance means a planned strategy of cost-effective treatments to an existing roadway system and its appurtenances that preserve assets by retarding deterioration and maintaining functional condition without increasing structural capacity. Work activities and actions that are included as a capital preventive maintenance activity are those that extend the life of the asset, but do not change the original design, function, or purpose of the asset; the primary purpose of the work is to repair the incremental effects of weather, age, and use; the useful service life or benefits extend beyond the next fiscal year; and the work may restore some structural capacity of the road but, it does not substantially increase the loading allowed.

<u>Construction</u>: Construction is the building of a new road, street or bridge on a new location, and the addition of lanes to increase the capacity for through traffic. It is the improving of an existing road or street by correcting the grade, drainage structures, width, alignment, or surface. It is the building of bridges or grade separations, and the repair of such structures by strengthening, widening, and the replacement of piers and abutments. It is the initial signing of newly constructed roads or streets, major resigning of projects, and the installation, replacement, or improvement of traffic signals.

<u>Heavy Maintenance</u>: The improving of an existing road or street by correcting the grades, drainage structures, width, alignment, surface, and the hard surfacing of gravel roads. It also includes the rebuilding of existing bridges or grade separations, and the repair of such structures by strengthening, and the replacement of piers and abutments.

<u>Maintenance</u>: According to Act 51, "maintenance" means routine maintenance or preventive maintenance, or both. Maintenance does not include capital preventive treatments, resurfacing, reconstruction, restoration, rehabilitation, safety projects, widening of less than one-lane width, adding auxiliary turn lanes of one-half mile or less, adding auxiliary weaving, climbing, or speed-change lanes, modernizing intersections, or the upgrading of aggregate surface roads to hard surface roads. **Pavement Surface Evaluation and Rating (PASER):** is a visual survey of the condition of the surface of the road. It rates the condition of various types of pavement distress on a scale of 1-10. It is based on a system of pavement evaluation developed in Wisconsin and is used by most road agencies in the state.

**<u>Reconstruction</u>**: Any construction where the road is totally reconstructed by reditching, new subgrade, subbase, and surface at the same location.

**<u>Resurfacing</u>**: Resurfacing pavements with minor base repair, minor widening, and resurfacing the existing width. This would include any double or triple seal coating.

**<u>Routine Maintenance</u>**: Routine maintenance includes actions performed on a regular or controllable basis or in response to uncontrollable events upon a roadway. Work activities or actions considered to be routine maintenance are those where the benefit or effective service life of the work does not last beyond the next fiscal year; the work would not significantly change the surface rating of the road; or the work would rarely require acquisition of right-of-way or site specific design.

**Structural Improvement**: Structural improvement includes any activity that is undertaken to preserve or improve the structural integrity of an existing roadway. The structural improvement category includes those work activities where the safety or structural elements of the road are improved to satisfy current design requirements. Structural improvement does not include new construction on a new location of a roadway; a project that increases the capacity of a facility to accommodate that part of traffic having neither an origin nor destination within the local area; widening of a lane width or more; or adding turn lanes of more than onehalf mile in length.

<u>Structurally</u> <u>Deficient Bridge</u>: Federal guidelines classify bridges as *structurally deficient* if at least one of three key bridge components (deck, superstructure, or substructure) is rated in poor condition. This means that qualified engineers have determined that the bridge requires significant maintenance, rehabilitation or replacement. A structurally deficient bridge may need to have heavy vehicle traffic restricted or eventually be closed until necessary repairs can be completed.

<u>Vehicle Miles Traveled (VMT)</u>: The total number of miles driven by all vehicles in Michigan during any given year. VMT can also be shown for any segment of road (total number of miles driven by all vehicles on the segment during any given year), or by geographic area (such as the total number of miles driven by all vehicles in a county during any given year.