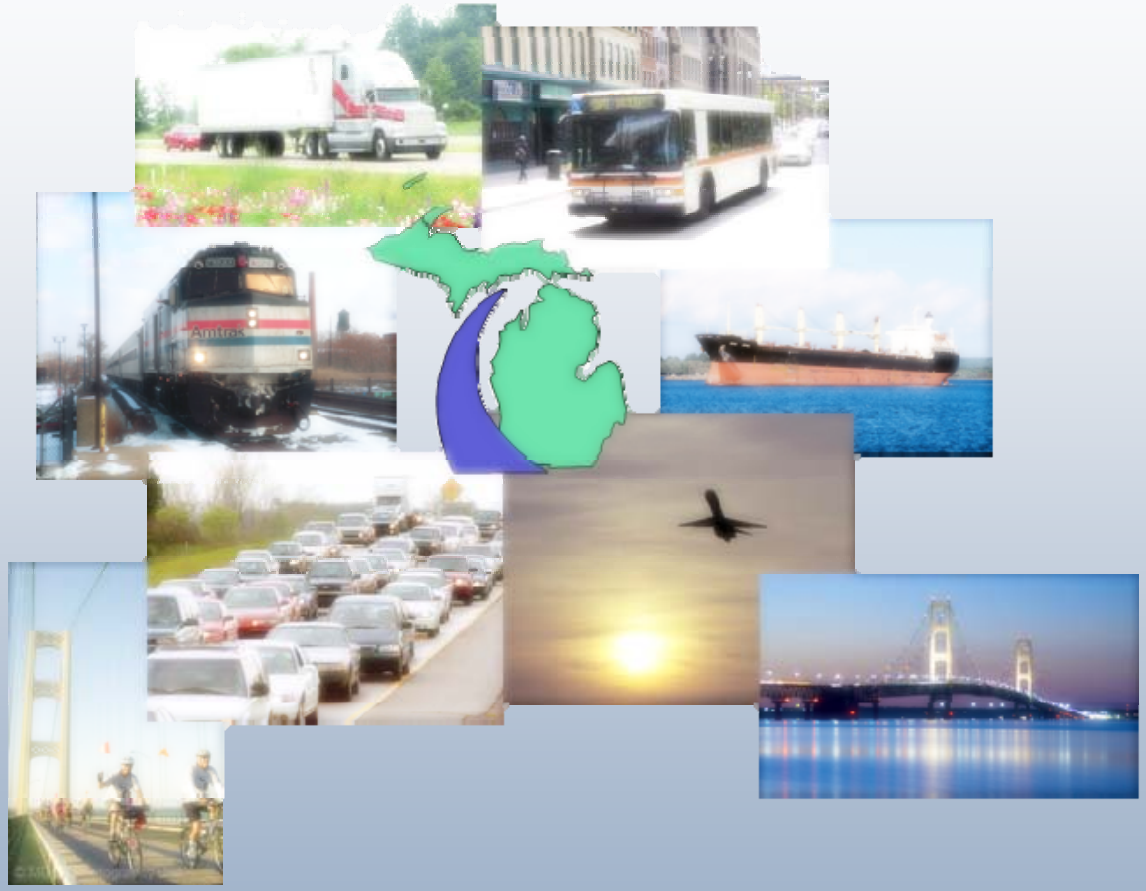
2016 System Performance Measures Report



The purpose of this report is to provide data on the condition and performance of Michigan's publicly-owned* transportation system.

*All performance measures in this report refer to assets owned, maintained, or financed (in whole or in part) by the Michigan Department of Transportation.

What are the intended purposes of the report?

The purpose of this report is to provide data on the condition and performance of Michigan's publicly-owned* transportation system.

Performance measurement uses statistical evidence to determine progress toward specific defined organizational objectives. It provides MDOT customers and stakeholders with simple answers to questions such as "What is the condition of Michigan's highways?" or "What is the status of Michigan's local transit services?" based on factual measurements and informed professional observations. The more detailed report levels also provide MDOT staff with a framework to consistently drive improvements in processes, performance, and outcomes. Although the report is not designed to be a self-contained process improvement solution, it can be a valuable tool for increasing understanding through analysis. Staff at all levels will benefit from broader diagnostic input. They can use their professional judgment and experience to effectively apply strategic remedies based on accurate data from these performance measures.

This reporting initiative intends to provide information about the transportation system in a simple and convenient format that can be easily accessed by all audiences. A top-level overview offers a quick system snapshot. In addition, anyone can expand the levels of detail where available.

In developing the initial MDOT Strategic Plan, the Strategic Planning Team made the following observation: "Measuring progress is a fundamental aspect of continuous improvement; however, measures must be strategically selected or they will become cumbersome, time-consuming and ineffective. MDOT should identify those aspects of transportation service that are most important to its customers and develop a limited set of measures focused on progress in those areas. This will focus MDOT actions on those aspects of operations with the potential for the greatest positive impact on customer satisfaction."

**All performance measures in this report refer to assets owned, maintained, or financed (in whole or in part) by the Michigan Department of Transportation.*

What are performance measures?
Performance measures are clear and concise statements that identify specific criteria, or benchmarks, for MDOT and others to use in judging the condition and performance of the transportation system.

What is included in the report?
Measures chosen for this report are only a representative sample of the countless measurements and data that are or could potentially be tracked by MDOT in the course of overseeing the building, maintenance, and operation of the state's transportation system. The selection of measures presented may change as the report is refined and as experience dictates.

This performance measure report includes definitions of standards along with status information that can be used to:
- Objectively assess progress toward achieving intended outcomes.
- Make results visible both inside and outside MDOT.

For road and bridge related measures, this report focuses on those roads and bridges for which MDOT is directly responsible. Local and county roads are not included, except in the crash-related measures. For the other modes, such as transit and airports, only those portions of the system for which MDOT has consistent and reliable data are included.

Data included in this report comes from various sources with diverse measurement and reporting schedules, as noted throughout. All figures show the most recently available data from each source.

All reported data is owned and managed by MDOT unless otherwise indicated.

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Why are performance measures important?
In general, performance measures are important because:
- They provide MDOT staff with a continuing source of accessible information to guide decisions.
- Accurate reporting is fundamental to meaningful dialog with customers and stakeholders.
- Transparency and accountability are important to MDOT.

The performance measures included in this report are tied to the four goal areas of the **State Long-Range Transportation Plan**. The four goal areas are: Stewardship, Safety and Security, System Improvement, and Efficient and Effective Operation. While the individual measures reported may change over time, this close connection ensures that the focus and importance of the reporting remains constant.

Reported measures include those that directly touch the public in matters ranging from highway safety, congestion, and ride quality, to transportation system access and multi-modal availability, to name just a few. Providing the best possible service to customers and stakeholders lies at the core of MDOT's mission: ***"Providing the highest quality integrated transportation services for economic benefit and improved quality of life."***

How was the report developed?
Although the report development process has been entirely internal to MDOT, the performance measurement teams at all levels did consider the work of other state and federal groups while determining recommended performance measures. Teams have focused on using existing data to the greatest extent possible, both to avoid the need to dedicate additional resources for data collection and to more quickly and effectively integrate performance measurement into everyday operations. The selection of measures presented in the report will very likely change over as this is an evolutionary process.

We welcome your comments and questions. Use the feedback button on each page to send us an e-mail.

When and how often will the report be updated?

This report will be updated twice in 2016 with final 2015 results. Some measures will be updated in March/April 2016 and others in September/October 2016. The title bar of each page of the report shows the date of the last report update. Look for the phrase: “Last Updated XX/XX/XXXX.

Site/Report Structure

This three-level report is comprised of:
1. Condition Trends, including information from each of the four main goal areas from the **State Long-Range Transportation Plan**:

- Stewardship
- Safety & Security
- System Improvement
- Efficient & Effective Operations

Summary indices in the “Condition Trends” level encapsulate the status and historical trends of all measures, and provide a glimpse of report content. However, there is substantial additional content in the second level. Readers are encouraged to go beyond this top level. This level is expected to be the most succinct "thumbnail" segment of the report. All four main reporting areas share the single page of the Condition Trends level.

2. Within the second level are each of the measurement standards currently being reported for each goal. This is a more complete story compiled from underlying data. This level is expected to be the most complete yet understandable report section for practical use by the average reader. Each segment indicates the measure, definition, standard, and status of the component under examination.

Every measure begins with an AIM (Action Intent of Measure). This statement indicates the intended result toward which the measure is directed. Many of these AIMs are drawn directly from the State Long-Range Transportation Plan. Others are logical outgrowths supporting the more general goals of the plan. The AIM both helps readers understand why a specific measure is being tracked and serves as one way to check the report’s scope.

3. A foundational third level of "raw" data detail and trend graphs is available for some measures. This is the underlying information upon which both of the higher levels of the report are based. Also included at this level are broad indications of general trends and informed predictions of future status, when available.

Site/Report Navigation

In general, you can use the menu bars and sub-topics on the left side of the screen. Clicking one of the main menu bars opens the slider to reveal main topics and sub-topics. Or you can click Measures by Goal Area and choose a specific measure from the grouped listing on the right. Measures listed in the Condition Trends are also linked to their respective second-level content pages.

- Clicking the topic or sub-topic link displays the corresponding information in the main screen.
- An indicator arrow and violet menu title let you know “where you are” in the report. ► You Are Here
- Click the "Back" link near the top of the menu to return to the previous screen.
- The topics covered in this report often have more than one component. Please note the presence of multiple tabs at the tops of many of the pages.
- The links for accessing the "third-level" supporting details, if any, are always found at the bottom of the "second-level" page.
- Words or abbreviations that are blue and underlined are clickable links. These take you to additional information such as definitions, lists, maps, or outside resources that support or clarify items in the report. Links leading to locations outside the report mention “http” or “online” in the tool-tip text that appears when you hold your mouse over the link. Naturally, an active connection to the Internet will be required for accessing these destinations.
- Clicking anywhere on the screen that is not a link or button will take you to the next page. If you wanted to see the entire report, you could start at the beginning and just keep clicking the screen until you got to the end.
- SAVING AND PRINTING: While we recommend on-line viewing to ensure you are referencing the latest version, if you would like to save a copy of the report to your own computer or print a hard copy, follow these steps:
  1. Click the “Full Screen On/Off” button in the lower left corner to get out of the full screen mode.
  2. Use the “Print” or “Save” buttons on the Adobe toolbar that becomes visible just above the report.

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23 USC 409 AND 402(k)(1)

This report provides information of which disclosure is restricted by federal law. It is the intent of these federal laws that this information not be disclosed, discovered or admitted into evidence for use in lawsuits for damages at locations addressed by this information. Federal law provides:

23 USC 409:
Reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings . . . or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed. . . .

23 USC 402(k)(1):
Notwithstanding any other provision of law, if a report, list, schedule, or survey is prepared by or for a State of political subdivision thereof under this subsection ["a comprehensive computerized safety record-keeping system designed to correlate data regarding traffic accidents, drivers, motor vehicles, and roadways"]. Such report, list, schedule, or survey shall not be admitted as evidence or used in any suit or action for damages arising out of any matter mentioned in such report, list, schedule, or survey.

Information covered by these sections includes information compiled or collected for the purpose of identifying, evaluating or planning safety enhancement projects and construction projects and information contained in computerized safety record keeping systems which correlate traffic crash data with highway features.

By providing information covered by 23 USC 409 and 402(k)(1), MDOT does not waive any objection it may have based on these sections. For your convenience the information covered by these sections is labeled **"USE RESTRICTED: 23 USC 409 and/or 402(k)(1)"**

Condition Trends for All Measures as of June 2016 (*All measures are links.*)

Measure (*Click on a measure to get more information.*)	Status	Change from Last Report	Change over Last 5 Years
Freeway Bridge Condition	Green	⇔	↑
Non-freeway Trunkline Bridge Condition	Green	⇔	↑
Reduction of Structurally-deficient Trunkline Bridges	Green	⇔	↑
Trunkline Pavement Condition Based on Sufficiency	Yellow	↓	↓
Trunkline Pavement Condition Based on International Roughness Index	Green	⇔	↑
Trunkline Pavement Condition Based on Remaining Service Life	Green	⇔	↓
Trunkline Railroad Crossings	Green	↑	↑
Tier 1 Airport Primary Runway Pavements	Yellow	↓	↓
Rural and Specialized Transit Fleet Condition	Yellow	↓	⇔
Level of Intercity Passenger Rail Services	Green	↓	⇔
Rural Intercity Bus Access	Yellow	↑	⇔
Level of Local Bus Transit Services	Green	↓	↓
Carpool Lot Condition	Green	⇔	⇔
Statewide Crash Severity Reduction	Green	⇔	↑
Trunkline Crash Severity Reduction	Yellow	↓	↑
Local Roadway Crash Severity Reduction	No Standard	↓	↑
Safety-funded Project Return on Investment	Green	↑	↑
Road Agencies Serviced with Interoperable Communication Equipment	No Standard	↑	Not Available
Percentage of Program Dollars Spent on Protective Efforts	Green	⇔	⇔
Acceptable Level of Service on (Inter-)Nationally Significant Corridors	No Standard	⇔	⇔
Michivan Access Expansion	Yellow	⇔	⇔
Manage Traffic Incidents Timely	Green	⇔	↑

GREEN	Current status is at 90% or greater of target
YELLOW	Current status is between 75% and 90% of target
RED	Current status is less than 75% of target

↑	Condition Improving
↓	Condition Declining
⇔	Condition Staying About the Same

Measures Listed by State Long Range Plan Goal Area (*All measures are links.*)

Stewardship

Improve and sustain 95% of all freeway bridges in good or fair condition.
Sustain 85% of all non-freeway bridges on the trunkline system in good or fair condition.
Reduce the number of trunkline bridges that are structurally deficient.
Improve or sustain 90% of trunkline pavements in fair or better condition based on Sufficiency.
Improve or sustain 90% of trunkline pavements in fair or better condition based on International Roughness Index.
Improve or sustain 90% of trunkline pavements with a Remaining Service Life value of three years or higher.
Increase the percentage of trunkline railroad crossings that are rated in fair or better condition.
Maintain 100% of all tier 1 airport primary runway pavements in good or better condition.
Minimize the portion of the rural transit and the specialized transit fleet that is operating past its useful life.
Preserve existing intercity passenger rail transportation services.
Preserve existing rural intercity bus access.
Preserve existing local bus services including specialized transit service.
Maintain 90% of all trunkline carpool parking lot pavements in good or fair condition.

Safety and Security

Reduce crash severity on all roadways, statewide.
Reduce crash severity on the state trunklines.
Reduce crash severity on the local roadways.
Ensure that safety projects provide the maximum return for funding dollars.
Enhance and increase protective measures and implement effective border continuity.

System Improvement

Increase percent of route miles along corridors of national/international significance having acceptable level of service.
Expand MichiVan access.

Efficient and Effective Operations

Reduce Delays: Minimize disruption to mobility resulting from incidents.

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Freeway Bridges | Non-freeway Bridges | Structurally Deficient Bridges

Bridges (Freeway) Condition

AIM:
Improve and sustain 95% of all freeway bridges in good or fair condition.

Measure:
Measured using the National Bridge Inventory (**NBI**) rating.

Definition:
The NBI rating scale is 0 to 9. A condition of 7-9 classifies a bridge as "good" condition, 5-6 classifies a bridge in "fair" condition, and 4 or less classifies the bridge as being in poor condition.

Standard:
Percent of freeway bridges with NBI rating of greater than 4 for the three major bridge elements: deck (item 58), superstructure (item 59), and substructure (item 60).

Status:
As of March 26, 2015, 94.0% of freeway bridges are in good or fair condition.

Last Reported Status:
On July 25, 2014, 93.8% of freeway bridges were in good or fair condition.

Click link to view: **Bridges – Freeway Condition Details**

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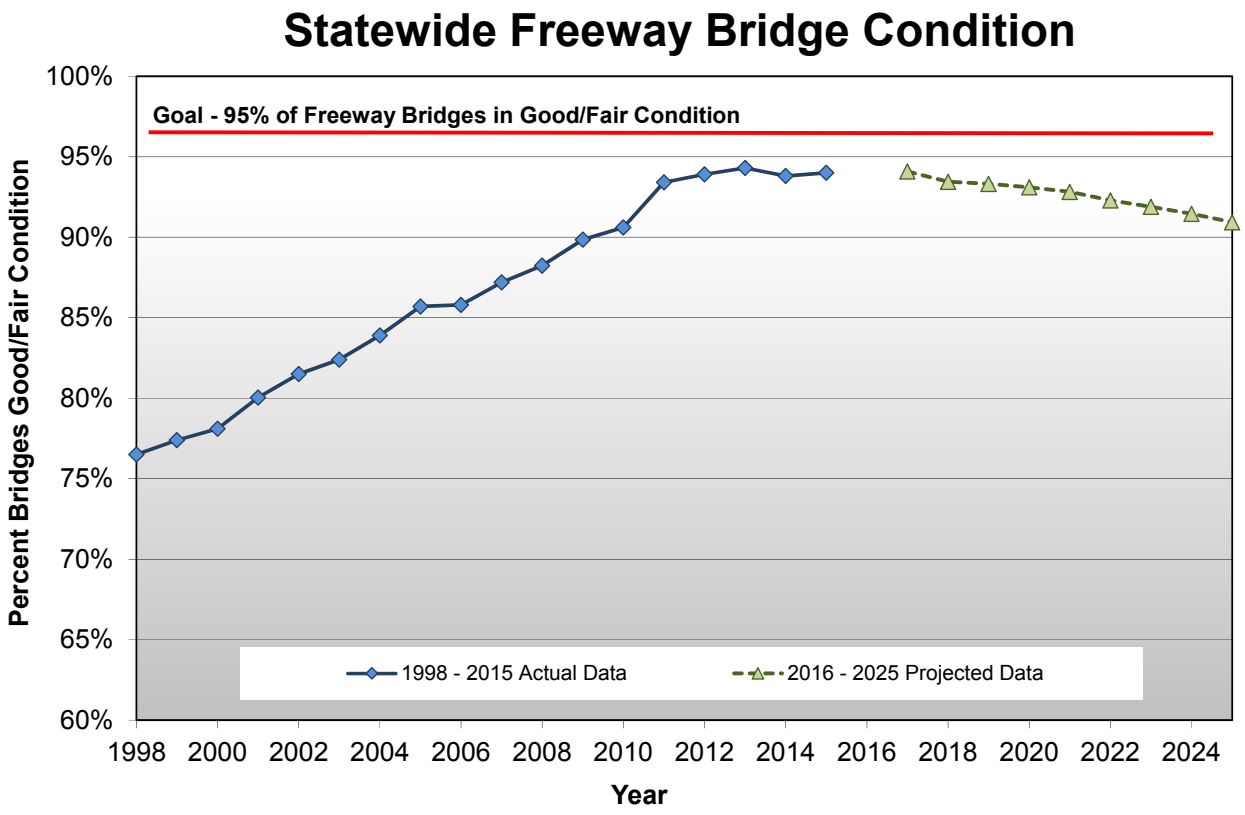
Bridges (Freeway) Condition Details

In 1998, Michigan's freeway bridge condition was 76.5%. As of March 26, 2015, 94.0% of freeway bridges were in good or fair condition, up slightly from 93.8% in July of 2014.

Historical trends and projections are updated annually.



Bridges (Non-Freeway) Condition

AIM:
Sustain 85% of all non-freeway bridges on the trunkline system in good or fair condition.

Measure:
Measured using the National Bridge Inventory (**NBI**) rating.

Definition:
The NBI rating scale is 0 to 9. A condition of 7-9 classifies a bridge as "good" condition, 5-6 classifies a bridge in "fair" condition, and 4 or less classifies the bridge as being in poor condition.

Standard:
Percent of non-freeway bridges with NBI rating of greater than 4 for the three major bridge elements: deck (item 58), superstructure (item 59), and substructure (item 60).

Status:
As of March 26, 2015, 94.1% of non-freeway bridges are in good or fair condition..

Last Reported Status:
On July 25, 2014, 94.3% of non-freeway bridges were in good or fair condition.

Click link to view: **Bridges – Non-Freeway Condition Details**

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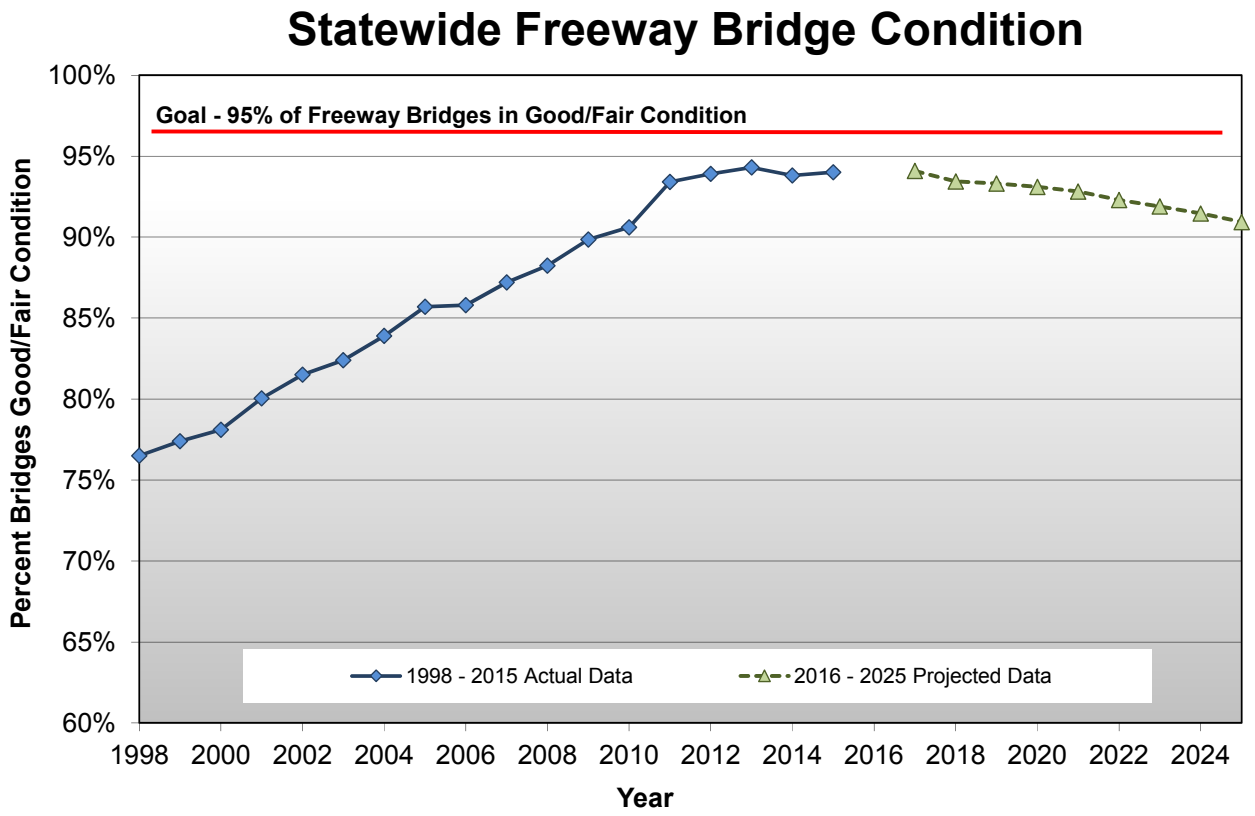
Bridges (Non-Freeway) Condition Details

In 1998, Michigan's non-freeway trunkline bridge condition was 79%. As of March 26, 2015, 94.1% of non-freeway trunkline bridges are in good to fair condition. Michigan reached the goal of 85% of non-freeway bridges in good or fair condition in 2004, and have been able to sustain the condition above the goal since.

Historical trends and projections are updated annually.



Bridges – Structurally Deficient

AIM:
Reduce the number of trunkline bridges that are structurally deficient.

Measure:
Measured using the National Bridge Inventory (**NBI**) rating.

Definition:
The NBI rating scale is 0 to 9. A condition of 7-9 classifies a bridge as "good" condition, 5-6 classifies a bridge in "fair" condition, and 4 or less classifies the bridge as being in poor condition.

Standard:
A structurally deficient bridge is a structure in poor to critical condition (NBI rating of 4 or less), or a bridge that has a substandard load rating, or a bridge that has substandard waterway adequacy.

Status:
Based on the 2014 FHWA NBI data, MDOT has 4,441 highway bridges of which 258 are structurally deficient (5.8%). The number of structurally deficient bridges has been reduced every year since 2000.

Last Reported Status:
Based on 2013 FHWA NBI data, Michigan had 4,416 trunkline bridges of which 268 were structurally deficient (6.1%).

Click link to view: **Bridges – Structurally Deficient Details**

This performance measure reflects only bridges that are part of the state trunkline system (owned and maintained by MDOT). The State of Michigan Infrastructure Dashboard contains a similar measure for all Michigan bridges, including county/local government owned and maintained bridges.

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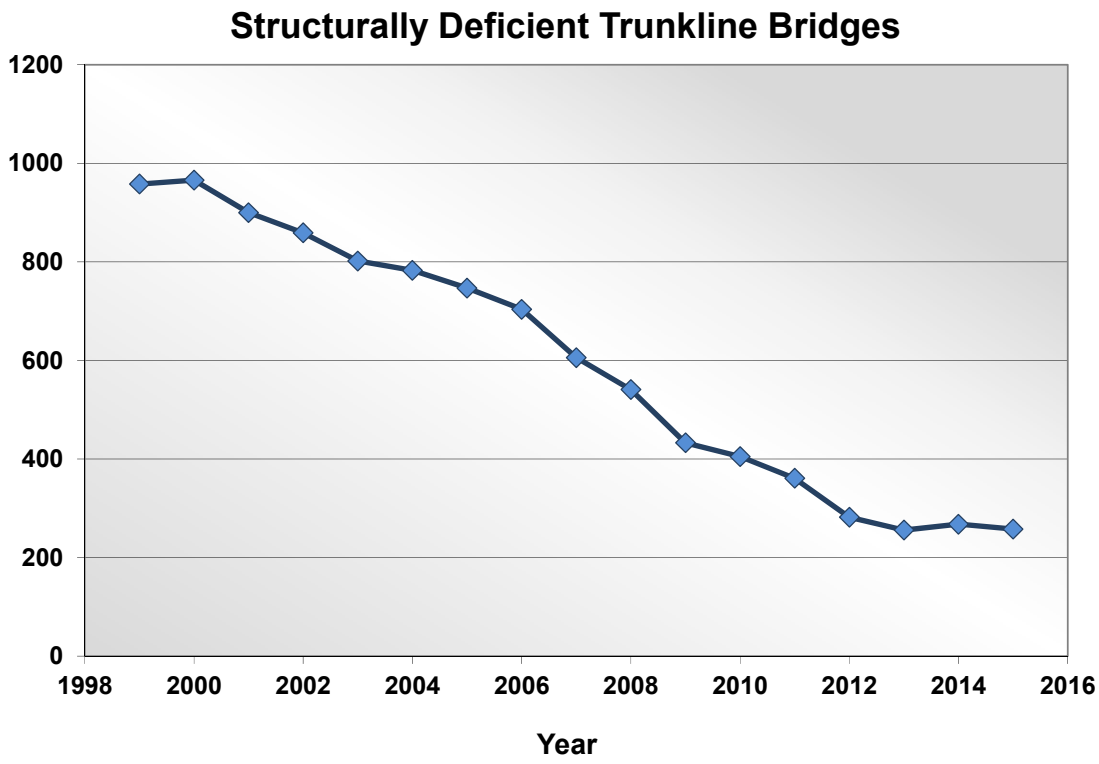
Bridges – Structurally Deficient Details

In 2000, Michigan had a total of 966 structurally deficient (SD) **trunkline** bridges. Based on 2014 FHWA NBI data, Michigan has 4,441 trunkline bridges of which 258 (5.8%) are structurally deficient. More detailed information may be found in MDOT's **Highway Bridge Report.**



This performance measure reflects only bridges that are part of the state trunkline system (owned and maintained by MDOT). The State of Michigan Infrastructure Dashboard contains a similar measure for all Michigan bridges, including county/local government owned and maintained bridges.

Trunkline Pavement Condition

AIM:
Improve or sustain 90% of trunkline pavements in fair or better condition based on Sufficiency.

Measure:
Sufficiency Surface Condition (SSC) rating.

Definition:
1 - Excellent: None or very little pavement deterioration.
2 - Good: Some initial deterioration not yet requiring appreciable amounts of maintenance.
3 - Fair: Occasional deterioration requiring routine maintenance operations.
4 - Poor: Frequent occurrence of surface deterioration requiring more extensive maintenance and/or reconstruction.
5 - Very Poor: Extensive surface deterioration. Warrants reconstruction soon.

Standard:
90% of trunkline pavements with an SSC rating of fair or better.

Status:
In 2015, 74.4% of trunkline pavements were in fair or better condition by SSC rating.

Last Reported Status:
In 2014, 77.3% of trunkline pavements were in fair or better condition by SSC rating.

Click link to view: **Trunkline Pavement Condition Details**

The sufficiency data set was retired at the start of 2016; this is the final sufficiency report.

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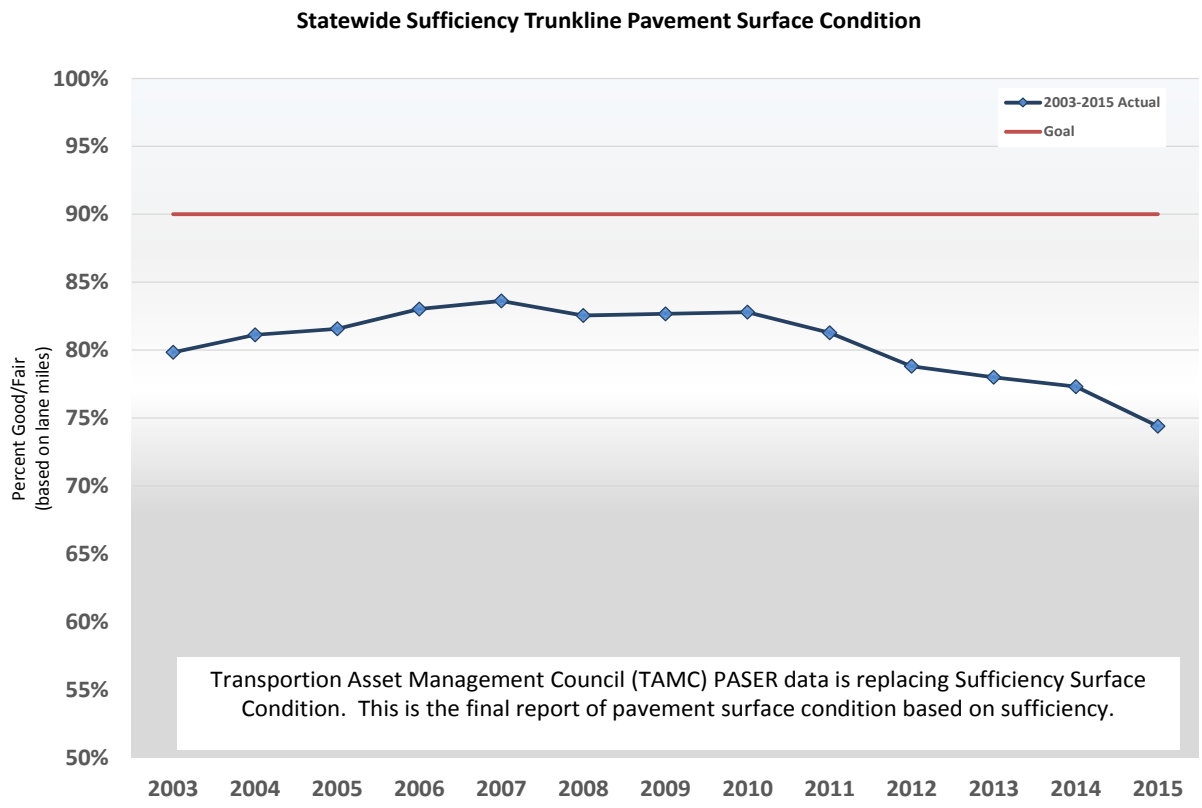
Trunkline Pavement Condition



Trunkline Ride Quality

AIM:
Improve or sustain 90% of trunkline pavements in fair or better condition.

Measure:
International Roughness Index (IRI).

Definition:
IRI is an internationally recognized standard measure of pavement roughness. Specially-designed profiler equipment is used to take measurements and calculate IRI based on the amount of vertical deflection along the wheel path on the roadway. For more information, click the IRI link above or the "details" link below.

Good: IRI less than 95 inches per mile.
Fair: IRI between 95 and 170 inches per mile.
Poor: IRI greater than 170 inches per mile.

Standard:
90% of trunkline pavements with an IRI of fair or better.

Status:
In 2015, 94% of trunkline pavements had an IRI of fair or better.

Last Reported Status:
In 2014, 94% of trunkline pavements had an IRI of fair or better.

Click link to view: **Trunkline Ride Quality Details**

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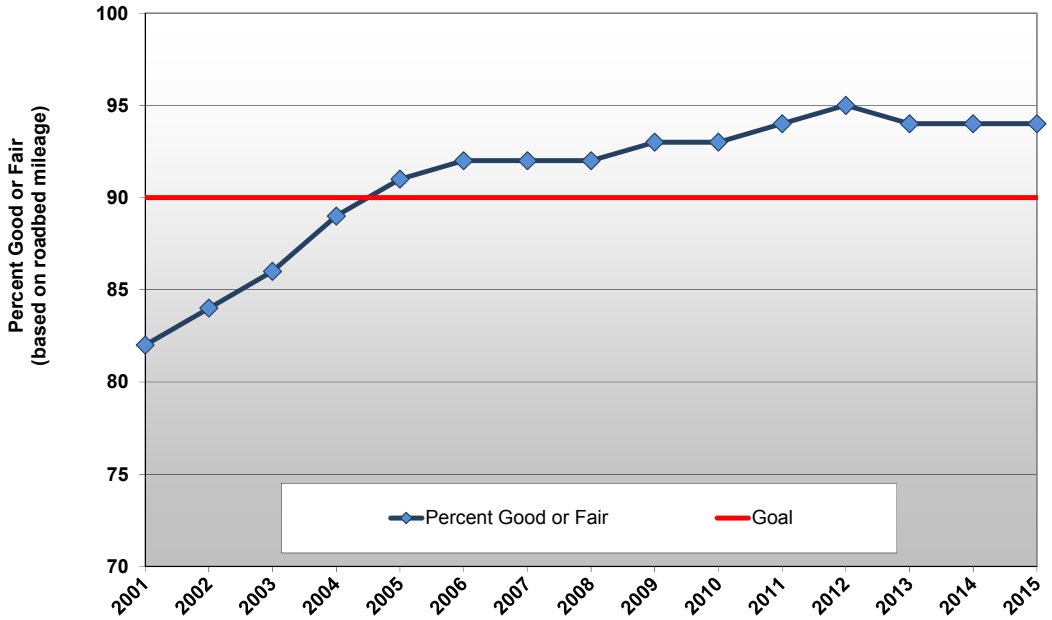
Trunkline Ride Quality Details

Developed by University of Michigan engineers at the request of the National Cooperative Highway Research Program (NCHRP) and the World Bank, the International Roughness Index (IRI) is currently used by highway professionals throughout the world as a standard scale to quantify the roughness of roads.

The IRI summarizes the roughness qualities that impact vehicle response (such as vehicle vibration), and is most appropriate when a measure is desired that relates to overall vehicle ride, operating cost, dynamic wheel loads, and overall surface condition. The IRI is determined by measuring the profile along the wheel paths of the road, and then filtering the profiles through an idealized mathematical model to simulate the suspension deflection of a passenger car. Several alternative profile-measuring technologies are available and work continues toward better reconciliation and refinement of the results produced among them.

Reference the following for more information about IRI:
*http://www.umtri.umich.edu/content/rr33_1.pdf
http://www.fhwa.dot.gov/pavement/ltpp/pubs/05054/chapt4.cfm

Pavement Ride Quality Details
(International Roughness Index)



Trunkline Remaining Service Life

AIM:
Improve or sustain 90% of trunkline pavements with a Remaining Service Life value of three years or higher.

Measure:
Remaining Service Life (RSL).

Definition:
Remaining Service Life is the estimated number of years until a pavement section will reach a level of surface distress where rehabilitation or reconstruction should be seriously considered

Standard:
90% of pavements with an RSL of 3 years or greater

Status:
In 2015, 84.3% of trunkline pavements had an RSL of 3 years or higher.

Last Reported Status:
In 2014, 85.3% of trunkline pavements had an RSL of 3 years or higher.

Click link to view: **Trunkline Remaining Service Life Details**

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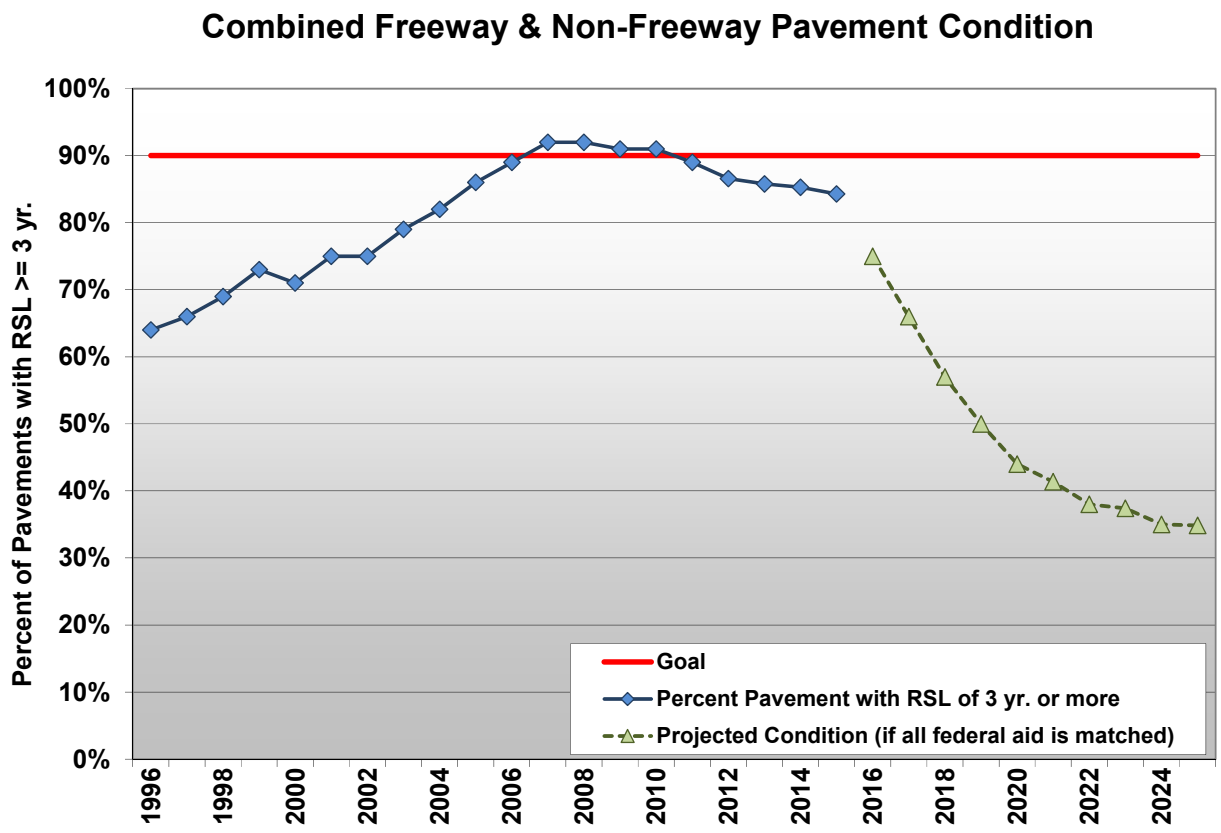
Trunkline Remaining Service Life Details

Remaining service life (RSL) has been variously described as:

- "the time in age or traffic applications from initial construction or reconstruction to first major rehabilitation "
- "the future time and traffic until a critical condition is reached and rehab is performed."
- "the life remaining in a pavement before a major rehabilitation or reconstruction is the most cost effective fix to apply"
- "the anticipated number of years that a pavement will be functionally and structurally acceptable with only routine maintenance."



Trunkline Highway – Railroad Crossings

AIM:
Increase the percentage of trunkline railroad crossings that are rated in fair or better condition.

Measure:
Crossing Condition Index (CCI).

Definition:
The CCI rates surfaces on a scale of 1 to 5, with 1 being the best condition and 5 being the worst condition. A good crossing surface has a rating of 2 on the CCI rating system.

Standard:
90% of trunkline highway-railroad crossings rated equal to or better than good or fair condition.

Status:
As of September 2015, 92.6% of trunkline highway-railroad crossings are in fair or better condition.

Last Reported Status:
As of September 2014, 91.1% of trunkline highway-railroad crossings were in fair or better condition.

Click link to view: **Trunkline Highway – Railroad Crossings Details**

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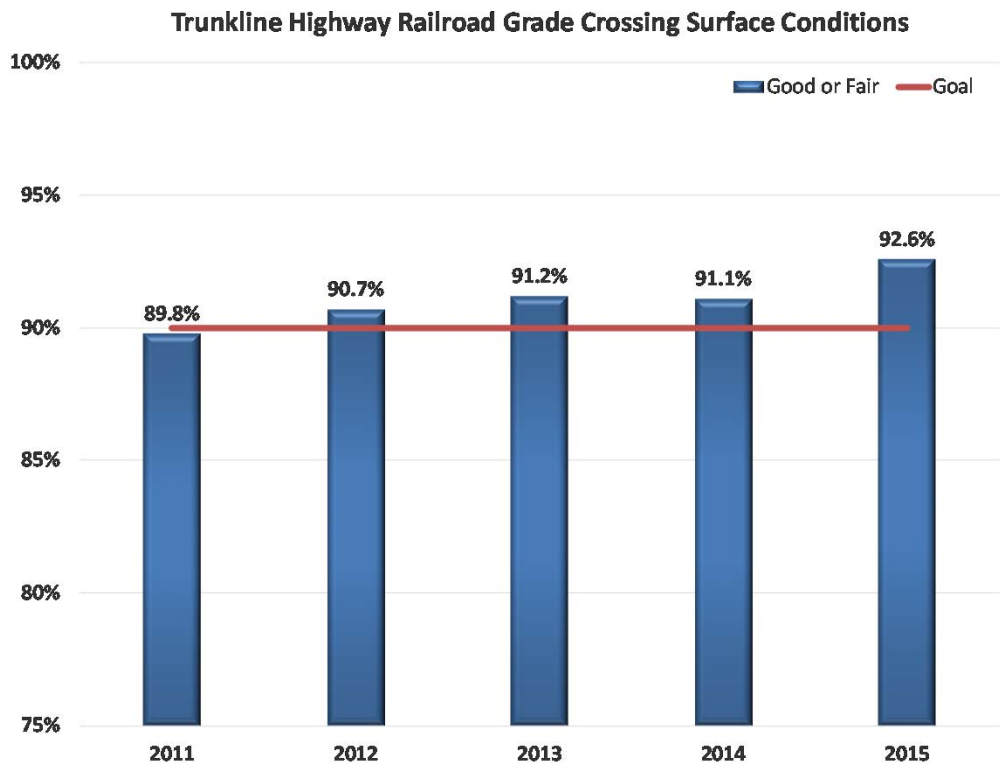
Trunkline Highway – Railroad Crossings Details

All public at-grade crossings in the state, including the 244 crossings on state trunklines, are subject to a biennial inspection by MDOT's Office of Rail to assess the crossings' physical condition. Data, including a crossing surface rating, is collected on approximately one-half of the crossings every year.



Airport Pavement

AIM:
Maintain 100% of all Tier 1 airport primary runway pavements in good or better condition.

Measure:
Pavement Condition Index (**PCI**).

Definition:
The PCI is a rating of the surface condition of a pavement and measures functional performance. The PCI provides a measure of the present condition of the pavement based on the distress observed on the surface of the pavement. PCI is rated on a scale of 0 to 100.

Standard:
100% of Tier 1 airport primary runways having PCI ratings equal to good or better condition.

Status:
As of 2014, 77% of Tier 1 airport primary runways are in good or better condition..

Last Reported Status:
As of 2013, 82% of Tier 1 airport primary runways were in good or better condition.

Click link to view: **Airport Pavement Details**

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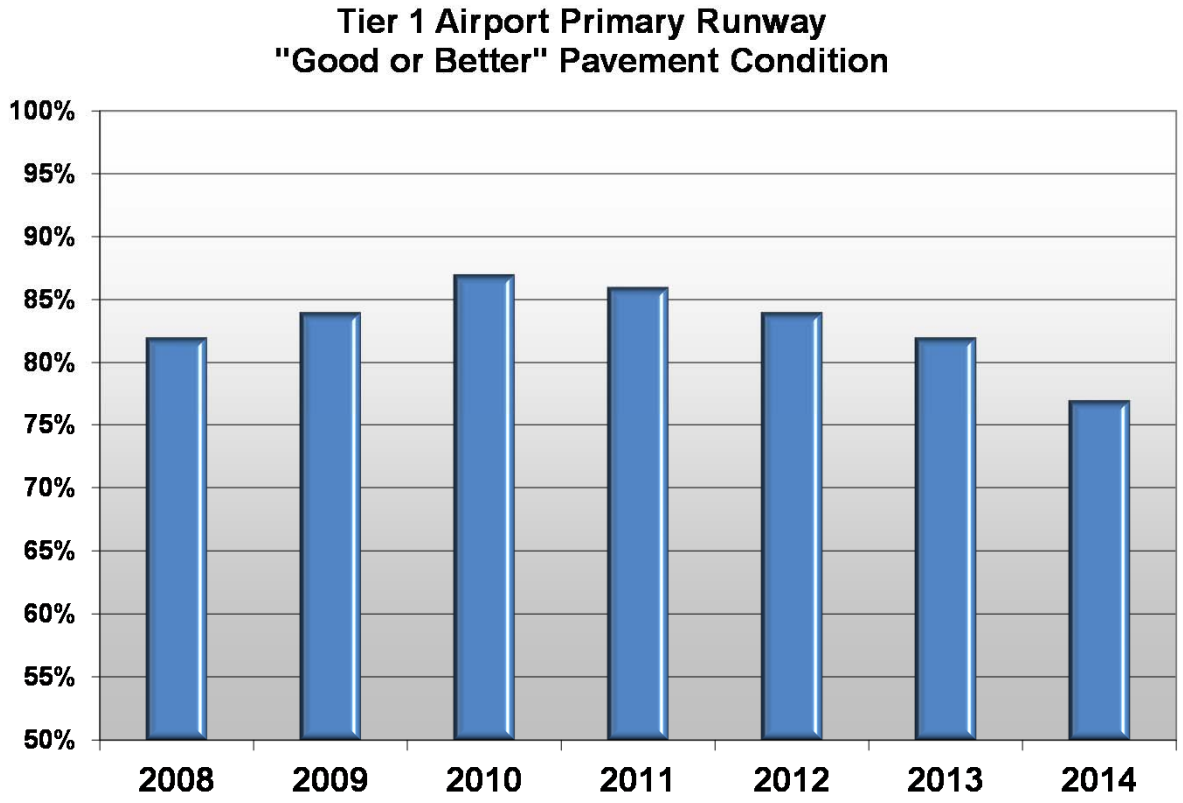
Airport Pavement Details

Pavement Condition Index is based on pavement condition survey procedures as documented in the U.S. FAA Advisory Circular 150/5380-6A, Guidelines and Procedures for Maintenance of Airport Pavements, and ASTM Standard D5340, Standard Test Method for Airport Pavement Condition Index Surveys. This data is collected every three years on every Tier 1 airport runway pavement by collecting data on one-third of the system every year. MDOT is using 2008 as the baseline year for data and trend reporting, and data will now be compiled and reported every year. The data is published in the Michigan Airport System Plan (MASP), which is available online. The data is compiled manually and does not currently exist in any management system.



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Bus Fleet Condition | Passenger Rail Service | Rural Intercity Bus Access | Local Bus Transit Service

AIM:
Minimize the portion of the rural transit and the specialized transit fleet that is operating past its useful life.

Measure:
The highest percentage of any one rural or specialized transit agency's fleet that is past its useful life.

Definition:
"Useful life" is based on the Federal Transit Administration's (FTA) definitions.

Buses:	
Cutaway - Light duty	5 years or 150,000 miles
Medium duty	7 years or 200,000 miles
Medium Heavy duty	10 years or 350,000 miles
Large Heavy duty	12 years or 500,000 miles
Trucks:	
Light duty	4 years
Heavy duty	7 years
Smaller Vehicles:	
Cars, Minivans, Maxivan, Van Conversion	4 years or 100,000 miles

Standard:
0% of bus fleet past its useful life – Desirable.
Less than 20% of bus fleet past its useful life – Acceptable.

Status:
As of July 30, 2014 the highest percentage of buses past their useful lives for any one agency was 15%.

Last Reported Status:
As of June 30, 2013, taking into account buses that would be replaced with funding approved through FY2013, including federal American Recovery and Reinvestment Act funds, the highest percentage of buses past their useful lives for any one agency was 21%.

Click link to view: **Preserve Bus Fleet Condition Details**

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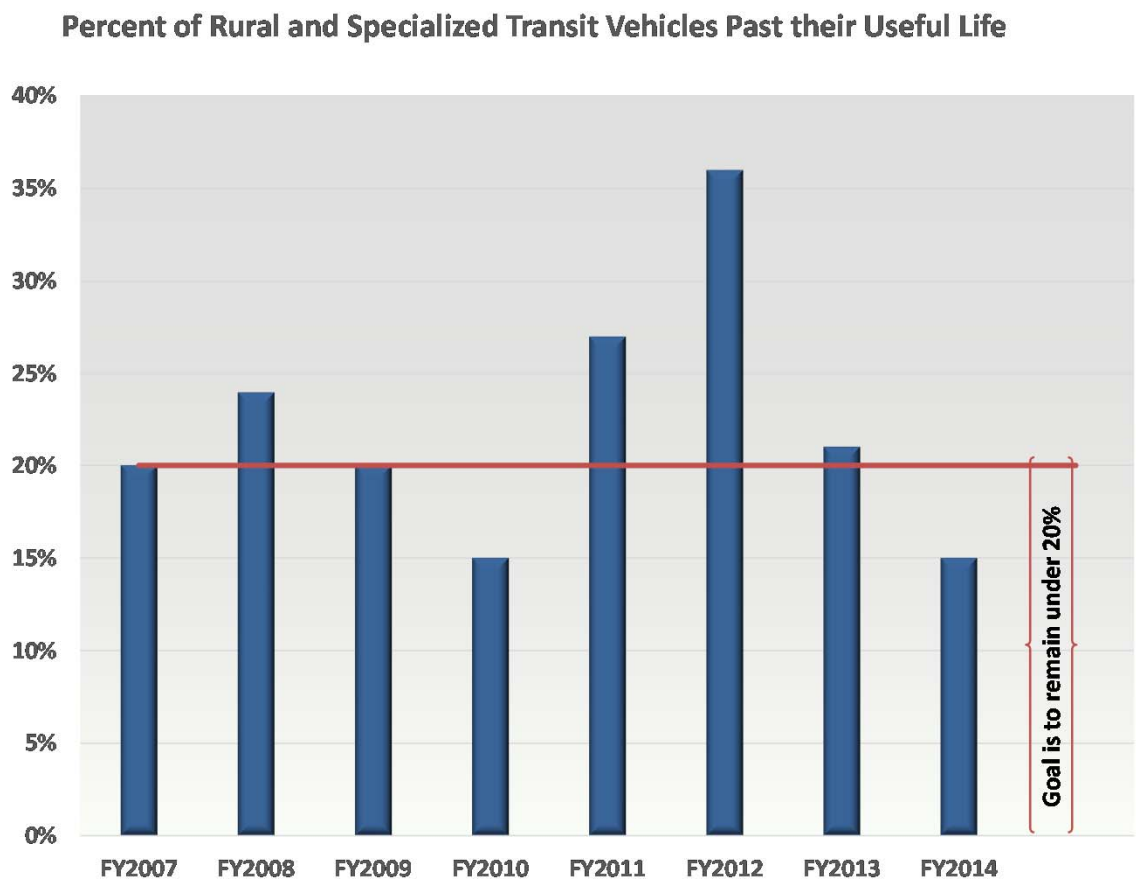
Bus Fleet Condition - Data Detail | Bus Fleet Condition - Program Detail



** Based on the rural or specialized transit agency with the largest percentage of vehicles past their useful life.*
In the last five years, all specialized vehicles have been replaced as they meet their useful life based on miles and years, so the percentages represent the rural fleet only.

Explanation of Bus Transit Fleet Condition

The Michigan Department of Transportation (MDOT) receives federal funds under the Section 5310 program every year for the replacement transit vehicles used by non-profit agencies and others for demand-response specialized transportation services that are aimed at the elderly and persons with disabilities.* These funds can only be used for capital projects, such as vehicle replacements.

MDOT also receives federal funds every year under the Section 5311 program that can be used for operating assistance **or** capital projects, including vehicle replacement, for general public rural transit services. Since 2005, MDOT has used its entire section 5311 apportionment for operating assistance. In some years, MDOT may also receive discretionary funds awarded for specific projects, such as rural bus replacements.

When federal funding is available under either of these two programs for vehicle replacements, MDOT allocates the funds among all the eligible agencies that have vehicles eligible for replacement based on their useful life (vehicle age and/or miles). MDOT allocates these funds using an asset management process that is aimed at ensuring no one agency has more than 20% of their total fleet past its useful life. Therefore, the agency with the largest percent of vehicles past their useful life is used as the indicator of the overall condition of the rural and specialized transit fleet.

From year to year, the rural fleet condition is largely a function of the amount of federal funds MDOT has available to allocate for vehicle replacement. Since MDOT allocates all of its routine annual funding for operating assistance, improvement of the rural transit fleet has been dependent on MDOT receiving federal discretionary grant awards for vehicle replacement. When MDOT has discretionary funds available, the condition of the fleet improves. In recent years, MDOT received capital funds under the American Recover and Reinvestment act. This was a limited-term program and MDOT utilized all available funds.

From year to year, the specialized fleet condition is largely a function of the number of vehicles eligible for replacement in contrast to the annual federal grant. In the last six years, MDOT has been able to replace most of the specialized vehicles as they become eligible for replacement, thereby minimizing the number of buses in the specialized fleet past their useful life.

For urban transit agencies, federal funds are awarded directly to individual transit agencies and each individual agency determines how the funds will be used each year and whether or not vehicles will be replaced. Therefore, there is not a statewide standard used to measure the condition of the urban transit fleet.

**does not include Americans with Disabilities Act (ADA) mandated paratransit services that supplement fixed route services*

AIM:
Preserve existing intercity passenger rail transportation services.

Measure:
1) Number of daily train miles.
2) Total annual ridership.

Definition:
1) Train miles traveled each day along designated routes.
2) Total number of passengers using state-supported passenger rail services.

Standard:
1) Maintain minimum of one round-trip daily service from Port Huron to Chicago and Grand Rapids to Chicago.
2) Maintain ridership based on national reporting for state-supported service, with Michigan ridership trends consistent with (within 10%) or better than national trends.

Status:
As of 2015, the standard is being met.

Last Reported Status:
No change since last report.

Click link to view: **Preserve Existing Passenger Rail Service Details**

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Train Mile Details | Ridership Details

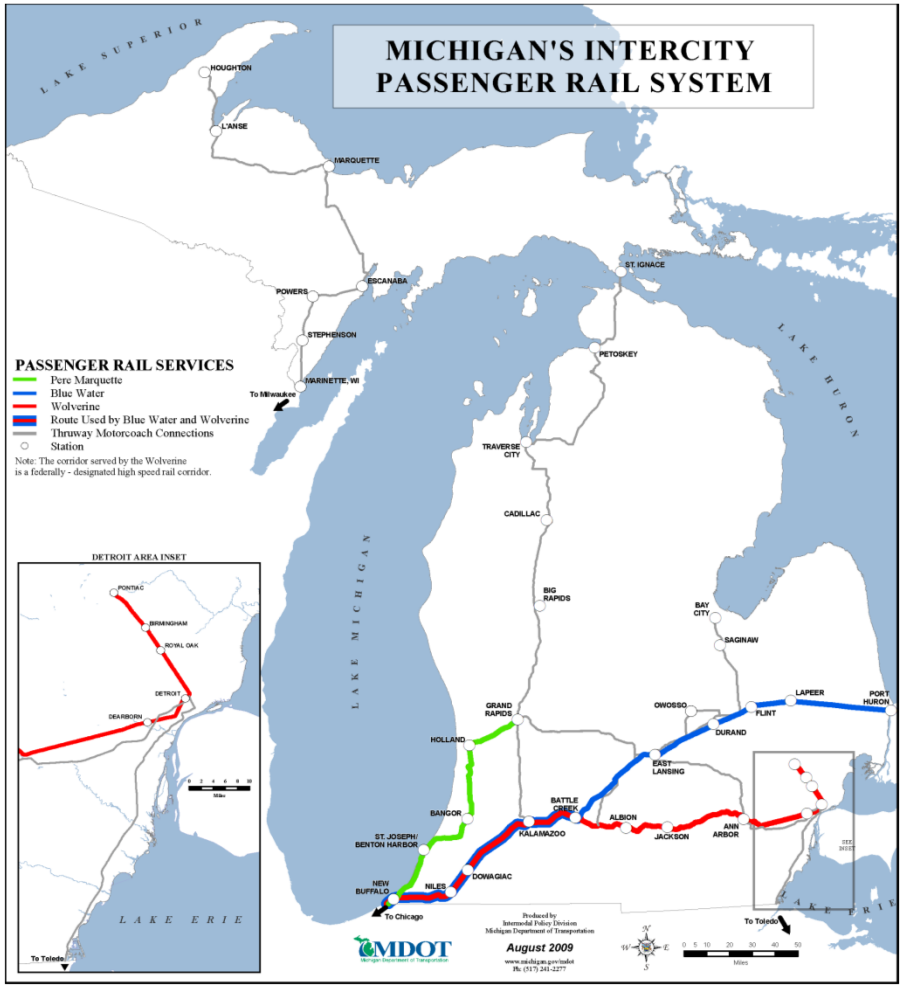
Preserve Existing Passenger Rail Services – Train Miles Details

MDOT is currently maintaining one round-trip daily service from Port Huron to Chicago and Grand Rapids to Chicago through state contracts with Amtrak. The data is collected by Amtrak and submitted to MDOT.

Pere Marquette (Grand Rapids to Chicago) is 352 train miles (176 miles one way) and runs every day of the year (365 days).

Blue Water (Port Huron to Chicago) is 638 train miles (319 miles one way) and runs every day of the year (365 days).

Click link to view online high-resolution pdf version:
Passenger Rail Service Map



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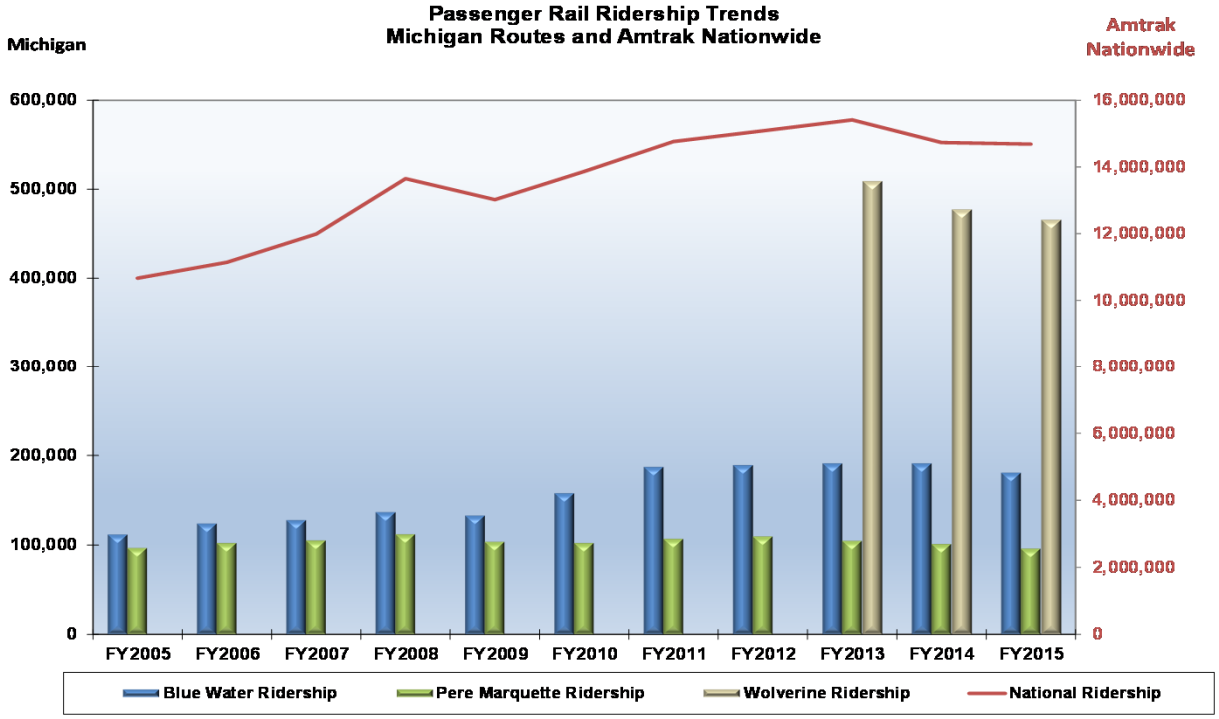
Train Mile Details | **Ridership Details**

Fiscal Year	Amtrak Nationwide		Michigan State-Supported Routes					Standard* Being Met?
	Ridership	Percent Change	Blue Water Ridership	Pere Marquette Ridership	Wolverine Ridership	Total Michigan Ridership	Percent Change	
2005	10,663,938		111,630	96,471		208,101		
2006	11,144,430	4.5%	123,823	101,932		225,755	8.5%	YES
2007	11,993,252	7.6%	127,642	104,819		232,461	3.0%	YES
2008	13,648,196	13.8%	136,538	111,716		248,254	6.8%	YES
2009	13,022,237	-4.6%	132,851	103,246		236,097	-4.9%	YES
2010	13,866,804	6.5%	157,709	101,907		259,616	10.0%	YES
2011	14,765,011	6.5%	187,065	106,662		293,727	13.1%	YES
2012	15,081,477	2.1%	189,193	109,321		298,514	1.6%	YES
2013	15,410,071	2.2%	191,106	104,491	509,100	804,697	-1.0%	YES
2014	14,731,993	-4.4%	191,231	100,961	477,157	769,349	-4.4%	YES
2015	14,686,508	-0.3%	180,617	95,807	465,627	742,051	-3.5%	YES

Note 1: Michigan percentage change for 2012 excludes Wolverine as this was the first year that line was state supported.

Note 2: Standard (*) - Michigan ridership trend consistent with or better than Amtrak national ridership trend (excludes Amtrak long-distance trains). If the change in Michigan is within ten percentage points of the change nationwide, the trends are considered consistent.



NOTE: Wolverine was not state-supported service prior to 2014.

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Bus Fleet Condition | Passenger Rail Service | Rural Intercity Bus Access | Local Bus Transit Service

Rural Intercity Bus Service Access

AIM:
Preserve existing rural intercity bus passenger transportation bus services.

Measure:
Percent of Michigan's rural population with access to an intercity bus stop.

Definition:
Population of the state within 25 miles of an intercity bus stop.

Standard:
Maintain statewide access to national intercity bus transportation system, defined as the percentage of the rural population that is within 25 miles of an intercity bus stop in Michigan.

Status
As of June 2015, 81% of Michigan's rural population resides within 25 miles of an intercity bus stop.
The national average remained 78% for 2015.

Last Reported Status:
As of June 2014, 76% of the rural population of Michigan lived within 25 miles of an intercity bus stop.
.

Click link to view: **Rural Intercity Bus Access Preservation Details**

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Rural Access Details | Ridership And Miles Details

Rural Intercity Bus Service Access Preservation

Prior to August 2011, MDOT measured intercity bus level of service in terms of the percent of the state's population within 100 miles of an intercity bus route. Starting in August 2011, MDOT shifted to a national standard, the percent of rural population within 25 miles of an intercity bus stop. This shift allows us to compare Michigan's rural intercity bus service to the service levels in other states, using a national report issued in 2011.* According to the national report, 90% of Michigan's rural population has access (is within 25 miles) of an intercity bus stop. The national average is 78%. The map at the right shows the rural population that has access to intercity bus stops in Michigan. This map was generated using more refined, and more current data than was used in the national study. According to MDOT generated data, 81% of Michigan's rural population has access to an intercity bus stop.

** The US Rural Population and Scheduled Intercity Transportation in 2010: A Five-Year Decline in Transportation Access*

Michigan Total Population (Caliper Corporation, June 2011)	9,883,640
Total Population within service area	9,219,131
Total Urban Population within service area	7,231,171
Total Rural Population within service area	1,987,960
Percentage of rural residents within service area (2015)	81%

Service Area is defined as a 25 miles radius from each Bus/Flag Stop. 109 Bus / Flag stops on the Michigan Network

Click link to view online full-resolution version:
Passenger Intercity Bus Coverage Map

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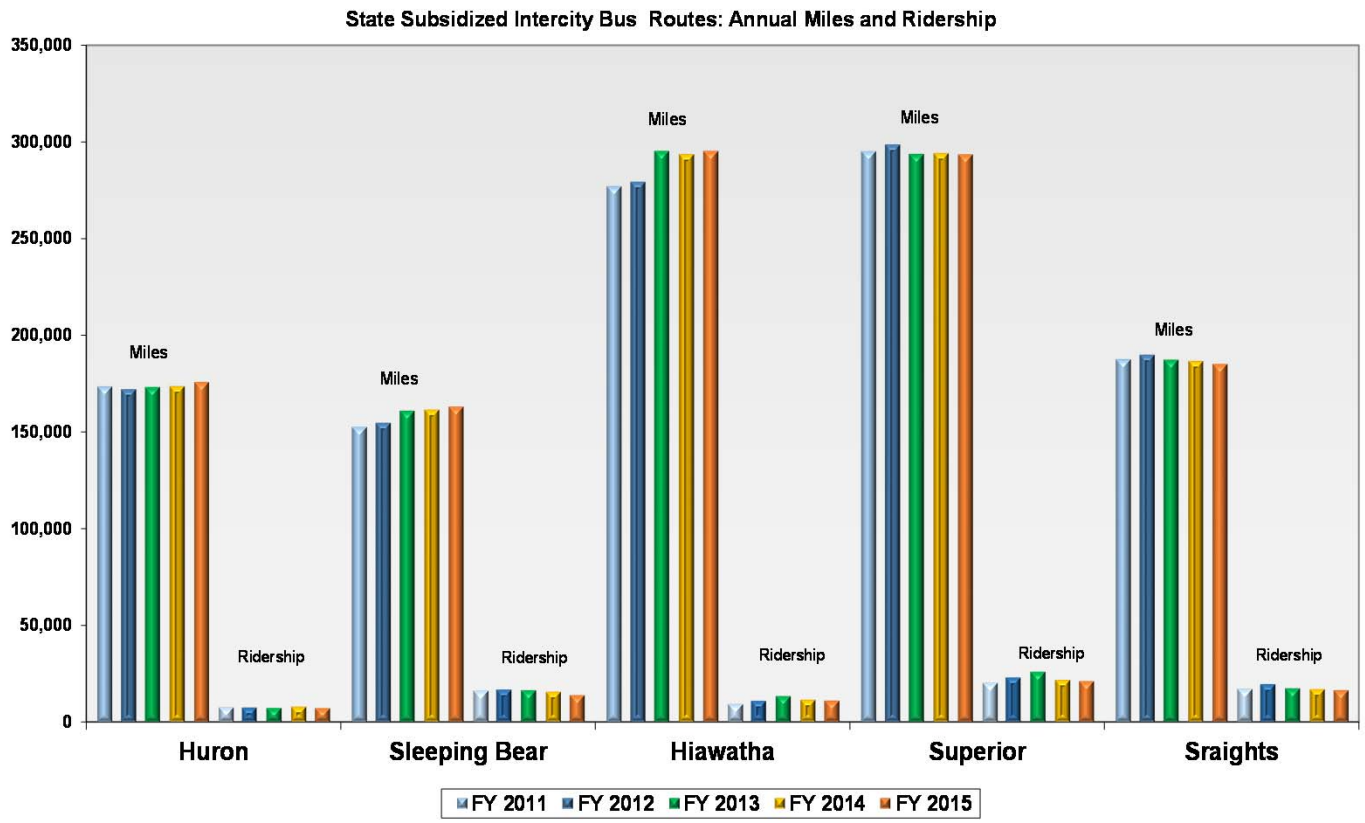
Rural Access Details
Ridership and Miles Details

Rural Intercity Bus Service Access Preservation

As of June 2015, 81% of the state's population is within 25 miles of an intercity bus stop. MDOT contracts for intercity bus service in rural areas of Michigan, to supplement the service provided by the private marketplace. Without these contracts, the northern lower peninsula and entire upper peninsula would not have the ability to use public transportation to access the state and national intercity bus and rail network. MDOT contracts for five routes.



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Bus Fleet Condition | Passenger Rail Service | Rural Intercity Bus Access | Local Bus Transit Service

Existing Local Bus Transit Service Preservation

AIM:
Preserve existing local bus services including specialized transit service.

Measure:
Level of Service, using five indicators.

Definition:
Level of service indicators include:

1. Some form of local transit in all 83 counties
2. Total Annual Passenger Trips
3. Total Annual Passenger Trips for Seniors and Persons With Disabilities
4. Total Hours of Service
5. Total Miles of Service

Standard:
Maintain level of service using all five indicators.

Status:

2014

Total Annual Passenger Trips	89,444,420
Trips for Seniors and Persons with Disabilities (subset of total)	12,269,788
Miles of Service	96,776,603
Hours of Service	6,717,333
Transit in all 83 counties	Yes

2013

Total Annual Passenger Trips	97,026,011
Trips for Seniors and Persons with Disabilities (subset of total)	12,599,127
Miles of Service	97,703,330
Hours of Service	6,090,381
Transit in all 83 counties	Yes

Click link to view: **Preserve Existing Local Bus Transit Details**

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Preserve Local Bus Transit Service Details (1 of 2) | Preserve Local Bus Transit Service Details (2 of 2)

Indicator #1: Some form of local transit in all 83 counties.
Currently, MDOT provides financial assistance for operating some form of public transportation in all 83 counties, which is an indicator that local bus transit exists in all 83 counties.

Click HERE for additional indicators (or see the next tab).

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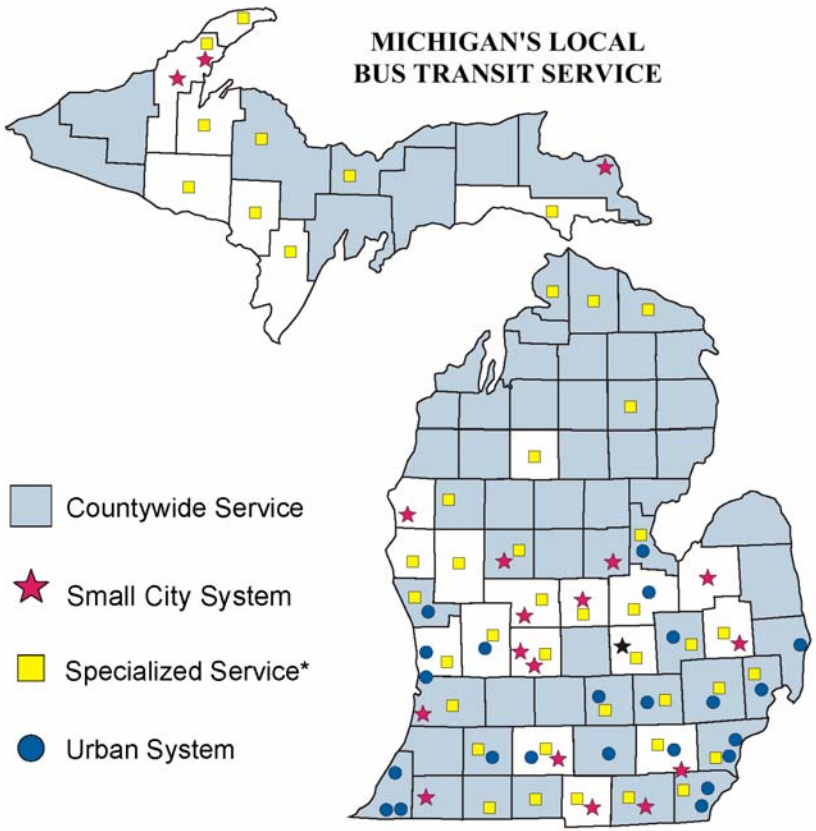
Michigan Local Public Transit Map



* The Specialized Service program provides financial assistance for operating transportation services primarily for elderly persons and individuals with disabilities.

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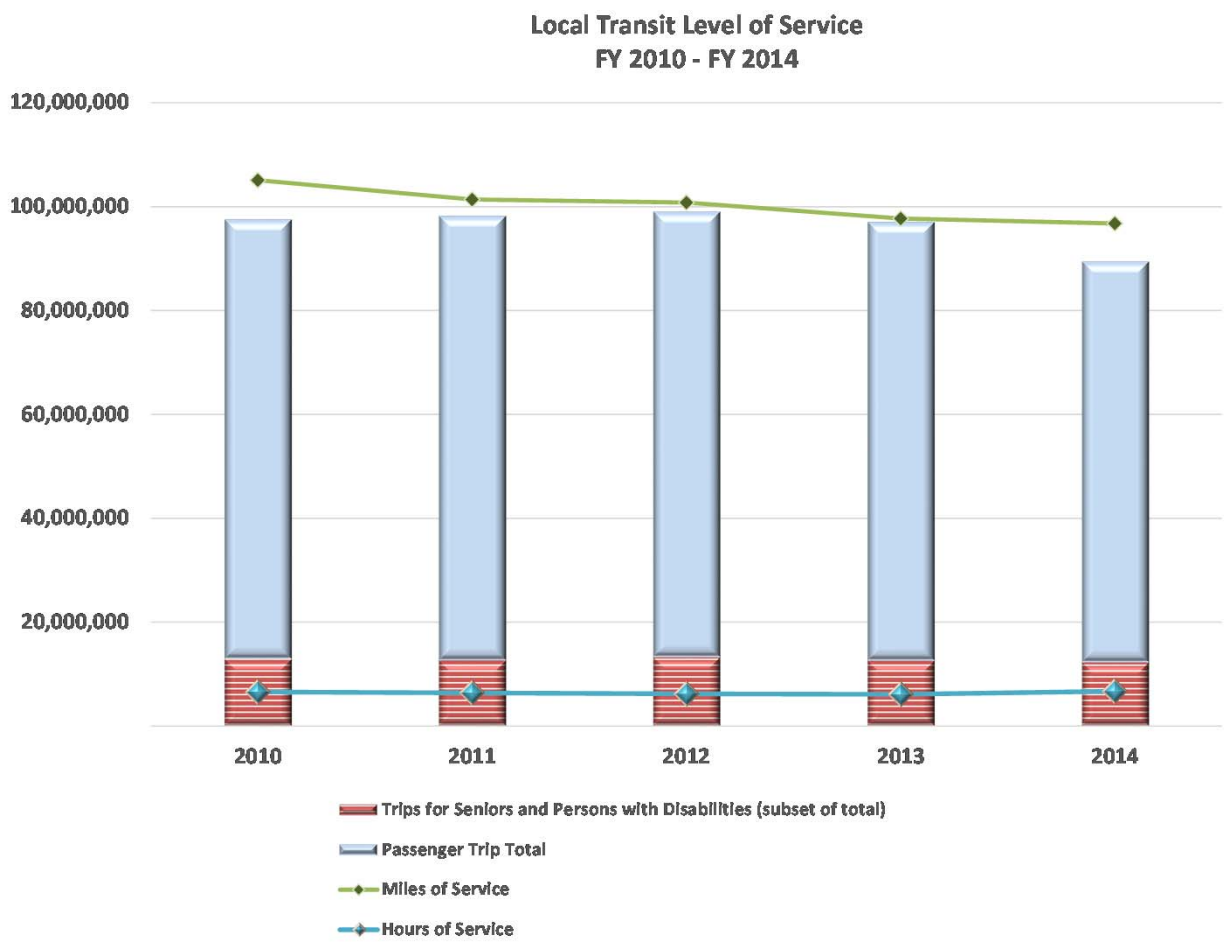
Preserve Local Bus Transit Service Details (2 of 2)



Carpool Parking Lot Pavement Condition

AIM:
Maintain 90% of all trunkline carpool parking lot pavements in good or fair condition.

Measure:
PASER rating.

Definition:

Rating Scale		
Rating	**Label**	**Definition**
8 to 10	Good	Requires only routine maintenance
5 to 7	Fair	Requires capital preventive maintenance to reach good condition
1 to 4	Poor	Requires structural improvement to reach good condition

Standard:
90% in good or fair condition.

Status:
In 2014, 95% of carpool lot pavements are in good or fair condition.

Last Reported Status:
In 2013, 96% of carpool lot pavements were in good or fair condition.

Click link to view: **Carpool Parking Lot Condition Details**

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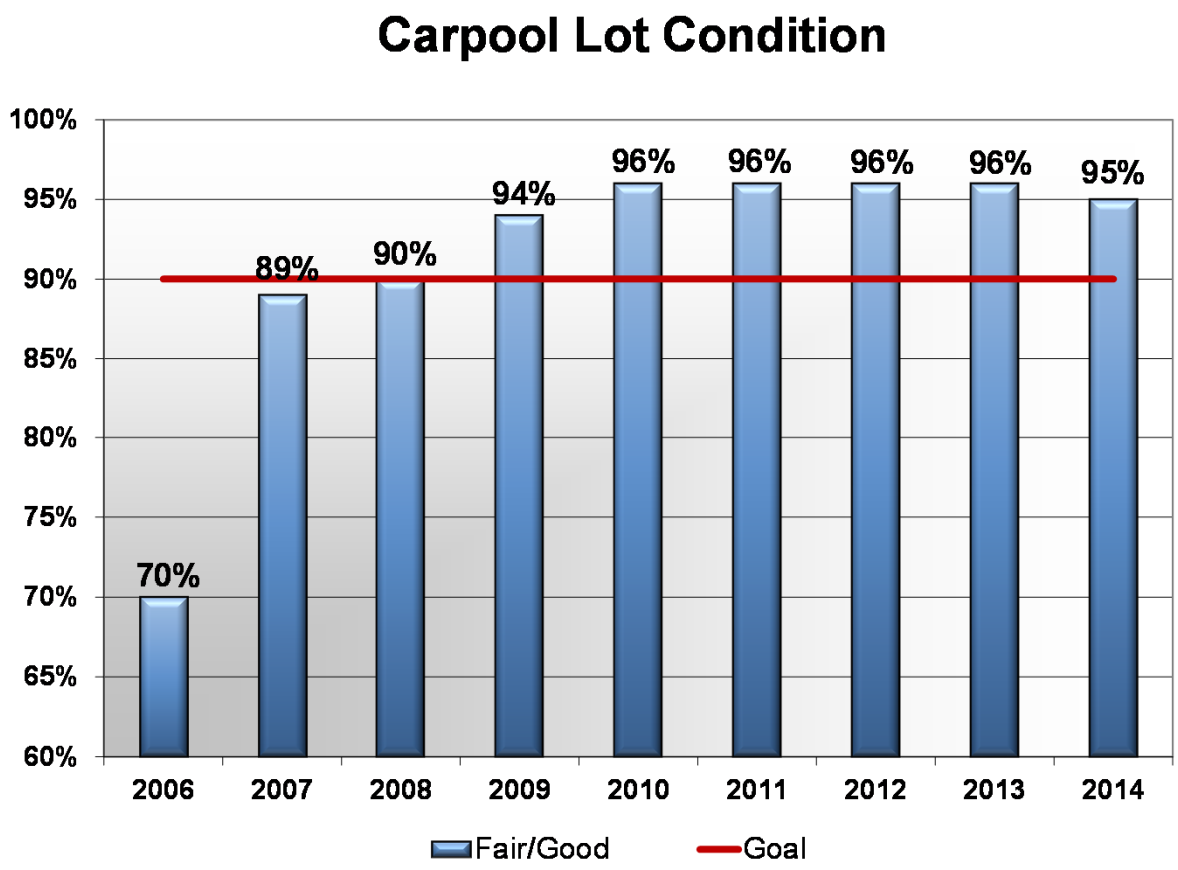
Carpool Parking Lot Condition Details

The condition of MDOT trunkline carpool lots statewide has improved from approximately 70% good or fair in 2006 to at or near 96% good or fair in 2010 through 2014. MDOT has met its objective of improving the carpool lot pavement condition to 90%.



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Statewide Crash Reduction | Trunkline Crash Reduction | Local Crash Reduction

AIM:
Reduce crash severity on all roadways, statewide (Reduce fatality and injury crashes).

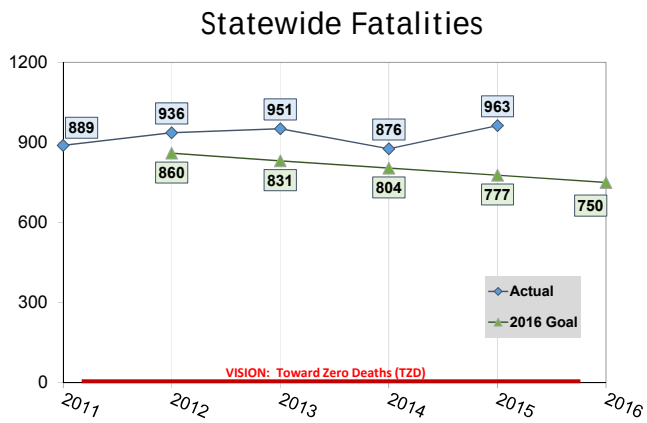
Measure:
The occurrence of fatalities and serious injuries per year on all roadways, statewide.

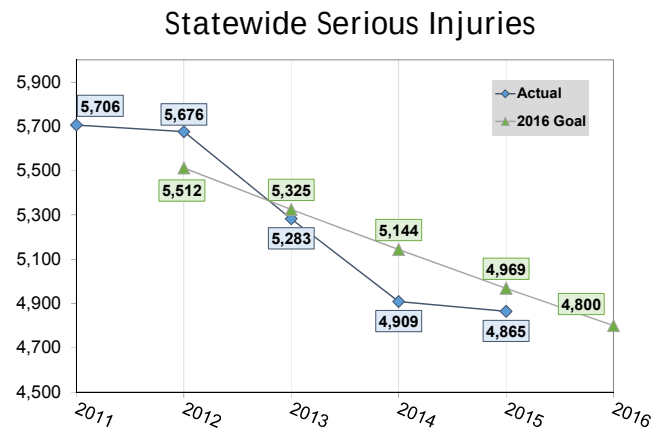
Definition:
Reportable fatalities and injuries as defined by the **Michigan Vehicle Code** and occurring on all roadways, statewide.

Standard:
Reduce fatalities and serious injuries from 889 and 5,706 in 2011 to no more than 750 and 4,800 in 2016. This equates to a 3.4% reduction per year. [Strategic Highway Safety Plan (**SHSP**) goals]

Status:
There were 963 Fatalities in 2015, a 9.9% increase from 876 in 2014.
There were 4,865 Serious Injuries in 2015, a 0.9% decrease from 4,909 in 2014.

Last Reported Status: See charts below.





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Statewide Crash Reduction Details

This performance measure is an overall indicator of performance measures for fatalities and serious injuries statewide in five focus areas: Intersections, Lane Departure, Pedestrians and Bicycles, Railroad Grade Crossings, and Work Zones.

The goal of Michigan's 2013-2016 Strategic Highway Safety Plan (SHSP) is to reduce statewide traffic fatalities and serious injuries from 889 and 5,706 in 2011 to no more than 750 and 4,800 in 2016.

Statewide Fatalities

Specific Crash Focus Areas	2010	2011	2012	2013	2014	2015	% Difference 2010 to 2014
Intersection	269	200	247	249	235	Fall 2016	-12.6%
Lane Departure	436	444	457	445	396		-9.2%
Pedestrian/Bike	163	166	157	179	170		4.3%
Railroad Crossing	3	6	1	2	5		66.7%
Work Zone	23	18	15	9	20		-13.0%

Statewide Serious Injuries

Specific Crash Focus Areas	2010	2011	2012	2013	2014	2015	% Difference 2010 to 2014
Intersection	2,082	1,958	1,940	1,756	1,626	Fall 2016	-21.9%
Lane Departure	2,314	2,244	2,155	2,090	1,858		-19.7%
Pedestrian/Bike	586	580	533	568	517		-11.8%
Railroad Crossing	11	9	6	8	8		-27.3%
Work Zone	105	105	57	77	70		-33.3%

Crashes can be in multiple focus areas.

Societal Cost of Crashes in Michigan Statewide

The cost estimate for Michigan crashes in 2014 was $36,971,857,800. This estimate is based on the National Safety Council's cost estimating procedures. Average comprehensive costs are based on the following national figures of Comprehensive Costs, 2014:

- Death $9,887,000
- Incapacitating Injury $1,082,000
- Non-incapacitating Injury $298,000
- Possible Injury $138,100
- No Injury $45,700

These cost estimates are not intended for comparisons to previous years. The National Safety Council made revisions to the cost model starting in 2014 that utilize data sources not previously available. The previous model had been in place since 1993. Deaths and injuries are calculated by number of persons. "No Injury" is calculated per crash.

Major Crash Types in Michigan Statewide (all roadways)

The following tables show the major crash types for fatal and serious injury crashes in Michigan between 2009 and 2014.

Statewide Fatal Crashes

Crash Type	2010	2011	2012	2013	2014	2015	% Difference 2010 to 2014
Single Vehicle	464	458	447	488	411	Fall 2016	-11.4%
Head On	88	102	99	99	119		35.2%
Head On - Left Turn	31	23	44	37	25		-19.4%
Angle	154	123	154	132	136		-11.7%
Rear End	48	48	51	55	47		-2.1%
Rear End - Left Turn	11	5	8	4	3		-72.7%
Rear End - Right Turn	1	3	0	1	0		-100.0%
Sideswipe - Same Direction	15	21	17	15	15		0.0%
Sideswipe - Opposite Direct	16	12	7	14	5		-68.8%
Other/Unknown	40	40	43	36	45		12.5%

Statewide Serious Injury Crashes

Crash Type	2010	2011	2012	2013	2014	2015	% Difference 2010 to 2014
Single Vehicle	2,203	2,027	2,028	1,896	1,698	Fall 2016	-22.9%
Head On	266	299	236	278	275		3.4%
Head On - Left Turn	260	219	249	226	204		-21.5%
Angle	1,037	982	926	828	824		-20.5%
Rear End	538	526	534	514	518		-3.7%
Rear End - Left Turn	42	44	48	48	19		-54.8%
Rear End - Right Turn	13	11	10	15	9		-30.8%
Sideswipe - Same Direction	138	145	140	131	139		0.7%
Sideswipe - Opposite Direct	63	74	59	65	60		-4.8%
Other/Unknown	237	279	310	310	299		26.2%

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Statewide Crash Reduction | **Trunkline Crash Reduction** | Local Crash Reduction

AIM:
Reduce crash severity on the state trunklines. (Reduce fatality and injury crashes.)

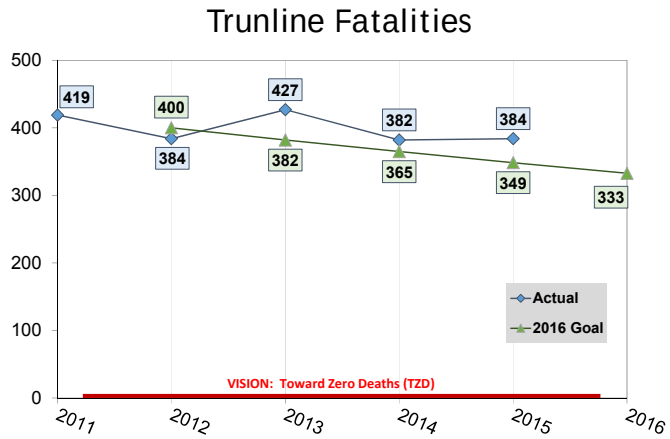
Measure:
The occurrence of fatalities and serious injuries per year on all state trunkline, statewide.

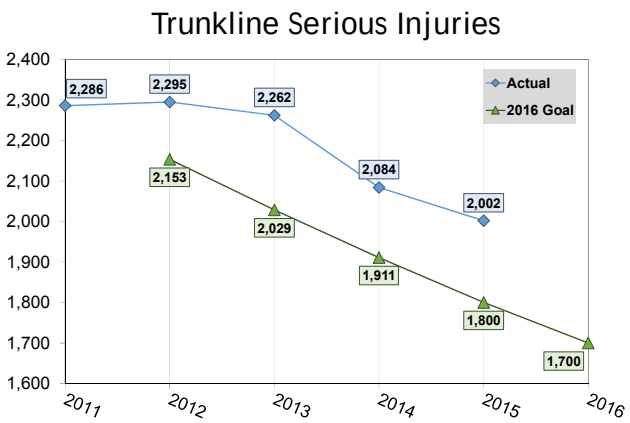
Definition:
Reportable fatalities and injuries as defined by the **Michigan Vehicle Code** and occurring on state trunklines.

Standard:
Reduce fatalities and serious injuries from 419 and 2,286 in 2011 to no more than 333 and 1,700 in 2016. This equates to a 4.5% and a 5.8% reduction per year respectively. While this is the goal for 2016 on the state trunkline, MDOT's vision is Toward Zero Deaths (TZD). Our ultimate goal is to reduce fatalities to zero and minimize serous injuries. The 2016 goal is the interim goal of our vision.

Status:
There were 384 Fatalities in 2015, a 0.5% increase from 382 in 2014.
There were 2,002 Serious Injuries in 2015, a 3.9% reduction from 2,084 in 2014.

Last Reported Status: See charts below.





Click link to view: **Trunkline Crash Reduction Details**

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Trunkline Crash Reduction Details

This performance measure is an overall indicator of performance measures for fatalities and serious injuries on the state trunkline system in five focus areas: Intersections, Lane Departure, Pedestrians and Bicycles, Railroad Grade Crossings, and Work Zones.

The goal of Michigan's 2013-2016 Strategic Highway Safety Plan (SHSP) is to reduce statewide traffic fatalities and serious injuries from 889 and 5,706 in 2011 to no more than 750 and 4,800 in 2016. The trunkline goal is a component of the statewide goal.

Trunkline Fatalities

Specific Crash Focus Areas	2010	2011	2012	2013	2014	2015	% Difference 2010 to 2014
Intersection	98	85	85	101	91	Fall 2016	-7.1%
Lane Departure	160	199	179	179	170		6.3%
Pedestrian/Bike	70	84	66	95	74		5.7%
Railroad Crossing	0	0	0	0	1		
Work Zone	18	13	10	8	11		-38.9%

Trunkline Serious Injuries

Specific Crash Focus Areas	2010	2011	2012	2013	2014	2015	% Difference 2010 to 2014
Intersection	778	733	723	665	628	Fall 2016	-19.3%
Lane Departure	807	825	739	821	730		-9.5%
Pedestrian/Bike	187	176	179	204	165		-11.8%
Railroad Crossing	1	1	0	4	0		-100.0%
Work Zone	84	64	36	53	42		-50.0%

Crashes can be in multiple focus reas.

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Statewide Crash Reduction | Trunkline Crash Reduction | Local Crash Reduction

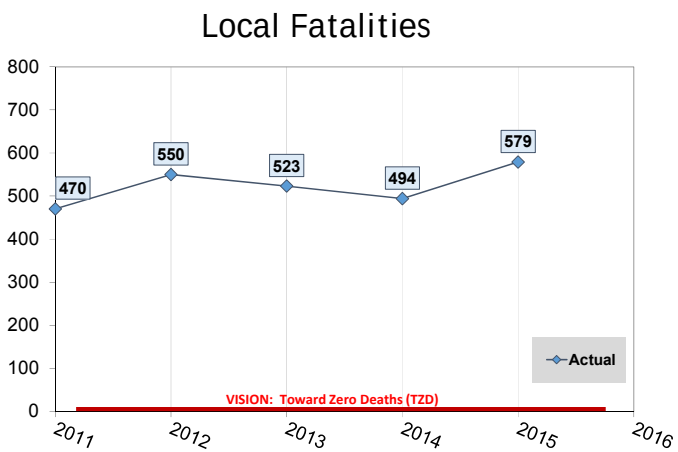
AIM:
Reduce crash severity on the local roadways. (Reduce fatality and injury and crashes.)

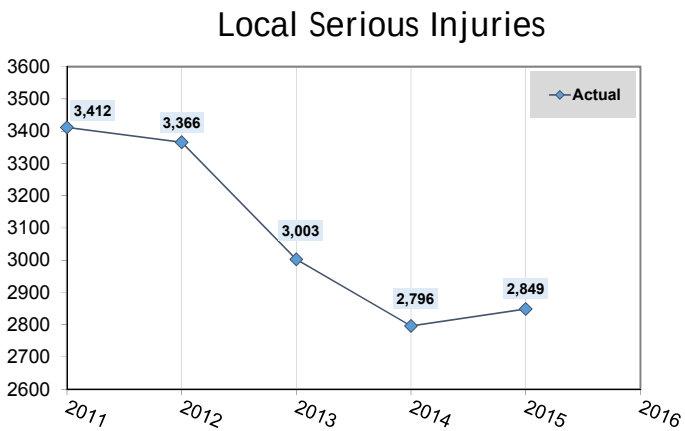
Measure:
The occurrence of fatalities and serious injuries per year on local roadways, statewide.

Definition:
Reportable fatalities and injuries as defined by the **Michigan Vehicle Code** and occurring on local roadways.

Status:
There were 579 Fatalities in 2015, a 14.7% increase from 494 in 2014.
There were 2,849 Serious Injuries in 2015, a 1.9% increase from 2,796 in 2014.

Last Reported Status: See below charts.





Click link to view: **Local Crash Reduction Details**

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Local Crash Reduction Details

This performance measure is an overall indicator of performance measures for fatalities and serious injuries on local roadways in five focus areas: Intersections, Lane Departure, Pedestrians and Bicycles, Railroad Grade Crossings, and Work Zones.

The goal of Michigan's 2013-2016 Strategic Highway Safety Plan (SHSP) is to reduce statewide traffic fatalities and serious injuries from 889 and 5,706 in 2011 to no more than 750 and 4,800 in 2016.

Non-Trunkline (Local) Fatalities

Specific Crash Focus Areas	2010	2011	2012	2013	2014	2015	% Difference 2010 to 2014
Intersection	171	115	162	148	144	Fall 2016	-15.8%
Lane Departure	276	245	278	265	226		-18.1%
Pedestrian/Bike	92	82	91	84	96		4.3%
Railroad Crossing	3	6	1	2	4		33.3%
Work Zone	5	5	5	1	9		80.0%

Non-Trunkline (Local) Serious Injuries

Specific Crash Focus Areas	2010	2011	2012	2013	2014	2015	% Difference 2010 to 2014
Intersection	1,301	1,224	1,217	1,087	991	Fall 2016	-23.8%
Lane Departure	1,498	1,412	1,416	1,255	1114		-25.6%
Pedestrian/Bike	398	403	354	636	350		-12.1%
Railroad Crossing	10	8	6	4	5		-50.0%
Work Zone	21	40	21	23	28		33.3%

Crashes can be in multiple focus areas.

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Cost Savings From Safety Investments

AIM:

Ensure that safety projects provide the maximum return for funding dollars.

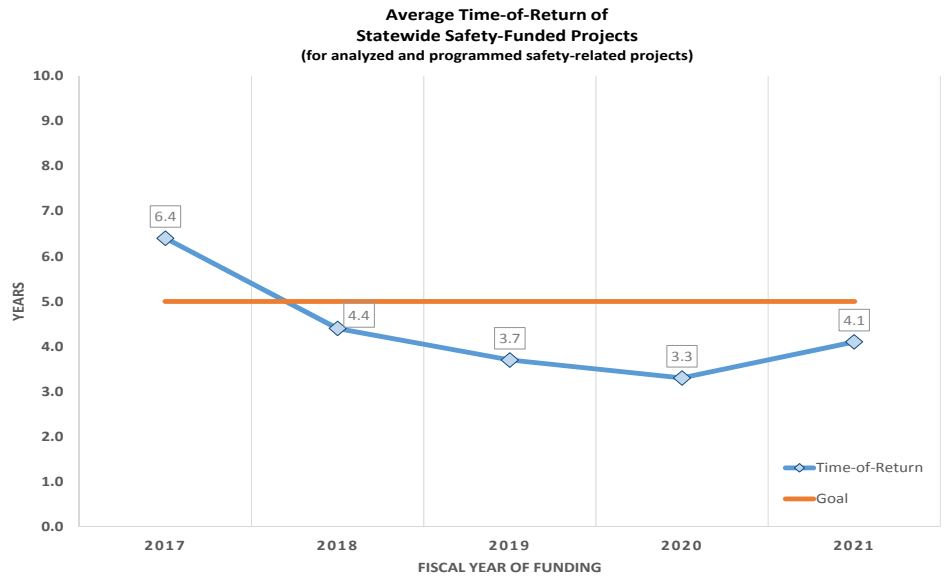
Measures:
Time-of-Return (TOR) of safety-funded projects.

Definition:
Average TOR for state trunkline safety improvement projects.

Standard:
Goal - Maintain TOR of safety-funded projects at 5.0 years or less.

Status:
The statewide average TOR has met the goal of 5.0 years or less for four of the last five fiscal years of funding.

Last Reported Status: See below chart.



Click link to view: **Cost Savings From Safety Investments Details**

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Cost Savings From Safety Investments Details

Time-of-Return for Safety-Funded Improvements

The use of a cost/benefit analysis (time-of-return) for selection of safety-related projects is required by the Highway Safety Improvement Program. The funding criteria of 7 years for stand-alone safety projects and 10 years for safety-related improvements with other road construction is stipulated in the process and agreed upon by FHWA for use of federal funds for safety-related improvements.

Safety-related projects have been selected and analyzed for time-of-return through FY 2021.

This performance measure is an average of seven performance measures for time-of-return by MDOT Region. The breakdown of time-of-return by MDOT Region is shown in the table below.

MDOT Region	2017	2018	2019	2020	2021
Bay	4.8	5.8	4.6	5.7	3.4
Grand	6.0	6.9	3.5	2.5	4.1
Metro	7.0	5.7	0.0	0.0	2.8
North	4.9	3.6	7.4	3.9	6.1
Southwest	6.9	6.3	2.1	7.7	2.9
Superior	10.0	5.8	6.4	6.9	0.0
University	7.4	2.1	1.9	3.2	3.6
Time-of-Return	6.4	4.4	3.7	3.3	4.1

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Interoperability | Protective Efforts

Reduce Risk and Vulnerability - Interoperability

AIM:

Enhance and increase protective measures and implement effective border continuity by:

- *Enhancing the ability to protect transportation facilities and mitigate vulnerabilities for all modes of transportation by increasing the number of interoperable communication equipment used by transportation agencies.*

Measure:

Total number of public road agencies serviced with interoperability talk group channels with MDOT (form 0184).

Definition:

The Michigan Public Safety Communications System (MPSCS) defines the interoperable communication requirements and talk group channels.

Standard:

MDOT uses and complies with the Michigan Interoperable Communications Plan standards.

Status:

Ongoing.* 78% of county-level road agencies are serviced by interoperable talk group channels with MDOT.

Last Reported Status:

74% of county-level road agencies were serviced by interoperable talk group channels with MDOT.

*****As this program is unfolding, MDOT is linked to some counties through their 911 dispatch instead of directly to the county road commission.*

Click link to view:
Vulnerability Reduction and Risk Management Details

Please Note!

For security reasons, some Risk/Vulnerability information cannot be shared. Contact the **Michigan State Police, Emergency Mgmt. & Homeland Security Division** for further details.

Vulnerability Reduction | Risk Management

Reduce Vulnerability Details
Enhancing and Increasing Protective Measures

MDOT addresses all modes of transportation and types of preparedness to deal with security and emergency situations caused by “all hazards.” The term “all hazards” (or multiple hazards) includes any incident, disaster or attack. The incident could be man-made (technological, act of terrorism), or an act of nature, such as flooding, fog, or major snow and ice storms. It includes programs such as emergency response to crashes and weather events; programs, strategies, and activities focused on terrorism and acts of destruction; as well as programs, strategies, and activities designed to address multiple hazards. MDOT tracks all grant program dollars towards these efforts.

MDOT has been involved in the state’s traditional emergency management for more than 50 years. Early programs included the “civil defense plans.” Following the events of September 11, 2001, MDOT updated and expanded its emergency preparedness programs and security role to cover all modes of transportation through the Transportation Risk Assessment and Protection (TransRAP) Team. The TransRAP Team also serves as the transportation subcommittee of the Michigan Critical Infrastructure Protection (CIP) Committee, an advisory panel reporting to the Michigan Homeland Protection Board created by Gov. Granholm through Executive Order 2003-06.

MDOT’s transportation security programs, strategies, and activities go beyond “guards and gates;” they are a multi-layered, “all hazards” approach. In general, MDOT’s strategy is to prevent, respond, and recover. MDOT’s strategy includes identifying potential targets (such as key bridges and high-volume roadways or transit facilities), working with its partners to assess and correct weaknesses, developing programs to strengthen and protect potential targets and points of entry into the state, and quickly and efficiently responding to and recovering from all hazards. One initiative in state preparedness is interoperable communications. MDOT is coordinating efforts and providing access to interoperable talk group channels with public road agencies or their dispatch centers.

The Transportation Security Administration (TSA) visited Michigan as part of a national effort and was impressed with the risk and vulnerability assessments of the transportation infrastructure performed in the state, primarily at border crossings. This included MDOT’s knowledge and awareness of the strengths, as well as weaknesses, involving these structures. The TSA also was pleased with the high level of communication and cooperation between state agencies, especially the interoperability between MDOT and Michigan State Police (MSP). This cooperation is not only fostered through homeland security discussions, but especially concerning emergency management issues.

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Interoperability | Protective Efforts

AIM:

Enhance and increase protective efforts and implement effective border continuity by:

- *Tracking funding used to address significant critical infrastructure issues and improve transportation infrastructure protection and resiliency at the international border including hazardous materials freight movement..*

Measure:

Percentage of program dollars spent on protective efforts.

Definitions:

The United States Department of Homeland Security (DHS) is a primary funding source for building and sustaining national preparedness capabilities through grant programs. The Michigan State Police (MSP) administer these grant programs on behalf of the State of Michigan.

Standards:

DHS requires MDOT comply with grant Program standards and requirements.

Status:

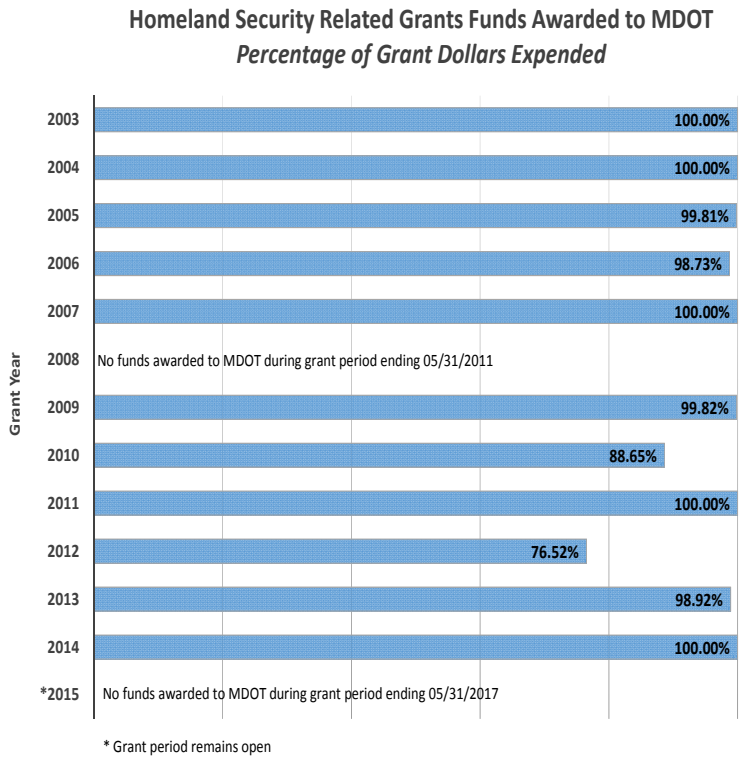
Ongoing. MDOT spent nearly 100% of grant dollars awarded through the 2014 grant cycle.

Last Reported Status: See chart at right:

Click link to view: **Vulnerability Reduction and Risk Management Details**

Please Note!

For security reasons, some Risk/Vulnerability information cannot be shared. Contact the **Michigan State Police, Emergency Mgmt. & Homeland Security Division** for further details.



Risk Management Details

Trunkline Safety Program
Enhancing and Increasing Protective Measures

Programs, strategies, and activities to implement effective methods to improve transportation infrastructure protection and resiliency at the international border; track open source events and determine reporting status by week; enhance the ability to determine risk and vulnerabilities relation to motor carriers to ensure continuity of hazardous materials freight movement across borders.

● MDOT actively participates in the protection of critical infrastructure, in cooperation with state, local, and federal agency partners in homeland security.
● MDOT conducted risk assessments at key MDOT-owned international border bridges. As a result of that work:
1. A list of the most important needs relating to homeland security was identified.
2. MDOT supplied information to the Michigan State Police (MSP), Military and Veterans Affairs (MVA), as well as the governor's office in Washington, reflecting the needs relating to the funding structure for domestic preparedness.
3. Action plans that respond to U.S. Department of Homeland Security terrorist threat levels have been developed and are in place at key MDOT-owned bridges.
● The original assessments from the border security risk assessments and action plan defined a strong path to follow. The federal team validated and verified the results.
● The top priority recommended for both international bridges includes the surveillance system and security enhancements. MDOT requested that the state administrative agency at MSP grant MDOT $1.25 million (each) for physical security enhancements at the Blue Water International bridges. These physical security enhancements are critical in addressing homeland security preparedness.
● MDOT recently completed a second round of security assessments for the International Bridge and the Blue Water Bridge with partners from the federal government. Members of the federal team included previous Navy SEALS, Army tactical specialists, and economic specialists. These bridges are critical to Michigan's economy and national security. Each of the bridges received high marks from the team.
● The result of this second round study was the development of a plan for security improvements to these two structures for which additional federal funding is needed.
● MDOT continues to improve the protection, collaboration and coordination with homeland security agencies in the development, construction, and operation of border facilities
● MDOT continues to develop and improve our tracking methods of open source events to manage possible increase in risk.
● MDOT continues to work with its partners who enforce regulations relative to transporting hazardous materials.

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Level Of Service (LOS)

AIM:
Modernize facilities to accommodate the efficient movement of people, goods and services.

Measure:
Percent of Route Miles along Corridors of National/International Significance Operating at an Acceptable Level of Service (LOS).

Definition:
Level of Service – a quality measure using a letter rating scale from A to F, where LOS A represents the best operating conditions and LOS F the worst. Click here for **map and examples**. Level of Service (LOS) is a qualitative measure that describes traffic conditions in terms of speed, travel time, freedom to maneuver, comfort, convenience, traffic interruptions, and safety.

Standard:
Acceptable LOS – Roadways having acceptable level of service are either “uncongested” or “approaching congested.” (See the map and examples for details.)

	Freeway	Non-Freeway
Uncongested	A - C	A - C
Approaching Congested	D - E	D
Congested	F	E - F

Status:
As of 2014, 97.2% of route miles along corridors of national/international significance are at an acceptable LOS.

Last Reported Status:
In 2013, 97.7% of route miles along corridors of national/international significance were at an acceptable LOS.

Click link to view: **Level of Service Details**

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Map of Major Corridors | Level of Service Examples

Click link to view online high-resolution pdf version (in State Long-Range Transportation Plan corridor report):

Michigan Corridors of Highest Significance Map

LEVEL OF SERVICE EXAMPLES

Level of Service (LOS) is a qualitative measure that describes traffic conditions in terms of speed, travel time, freedom to maneuver, comfort, convenience, traffic interruptions, and safety. Six classifications are used to define LOS, designated by the letters A through F. LOS A represents the best conditions, while LOS F represents heavily congested flow with traffic demand exceeding highway capacity. The photo simulations to the right illustrate the various classifications.

Level of Service "A"

Level of Service "B"

Level of Service "C"

Level of Service "D"

Level of Service "E"

Level of Service "F"

Percent of Route Miles along Corridors of National/International Significance Operating at an Acceptable Level of Service (LOS) Details (1 of 4)

Cost to Cure

The table shown below presents the estimated cost to cure congestion on the entire** **trunkline** system based upon 2013 congestion levels and an estimated 2014 cost of constructing additional lanes.

Statewide Congested Lane Miles (2014)

	Rural		Urban		Statewide
	Freeway	Non-Freeway	Freeway	Non-Freeway	Total
Lane Miles	0.00	33.37	88.12	626.71	748.20
$ millions	$0	$166	$2,148	$3,698	$6,011

**This Cost to Cure data is for the entire trunkline system, and represents the total new lane miles needed to fix the congestion; while the LOS status (and the LOS Trends tab) only show data for the National/International and Statewide Corridors of Highest Significance (COHS), which account for 46% of trunkline miles.

Percent of Route Miles along Corridors of National/International Significance Operating at an Acceptable Level of Service (LOS) Details (2 of 4)

Correlation to Michigan Transportation Plan Goals:
This measure supports efforts to modernize facilities to accommodate the efficient movement of people, goods and services.

This measure is used to monitor congestion trends for primary roadways that traverse the length of corridors of national or international significance as designated in **Mi Transportation Plan** (the State Long-Range Transportation Plan). All of the subject roadways are freeways except US-2.

Data:
This measure uses annual Sufficiency LOS ratings, and data are available by region or statewide for all state long range plan classified corridors – national/international, statewide, regional, and local.

Percent of Route Miles along Corridors of National/International Significance Operating at an Acceptable Level of Service (LOS) Details (3 of 4)

Definitions:

Level of Service—a quality measure using a letter rating scale from A to F, where LOS A represents the best operating conditions and LOS F, the worst. LOS ratings are defined as:

- **LOS A:** Free flow operations.
- **LOS B:** Reasonably free flow operations.
- **LOS C:** Provides for free flow of traffic with speeds still at or near free flow. Maneuvering within traffic stream is noticeably restricted.
- **LOS D:** Level of traffic volume at which speeds decline slightly, density begins to increase.
- **LOS E:** Describes operations at capacity. Operations are volatile due to no usable gaps in the traffic stream.
- **LOS F:** Breakdown in vehicular flow. Traffic volume exceeds roadway capacity.

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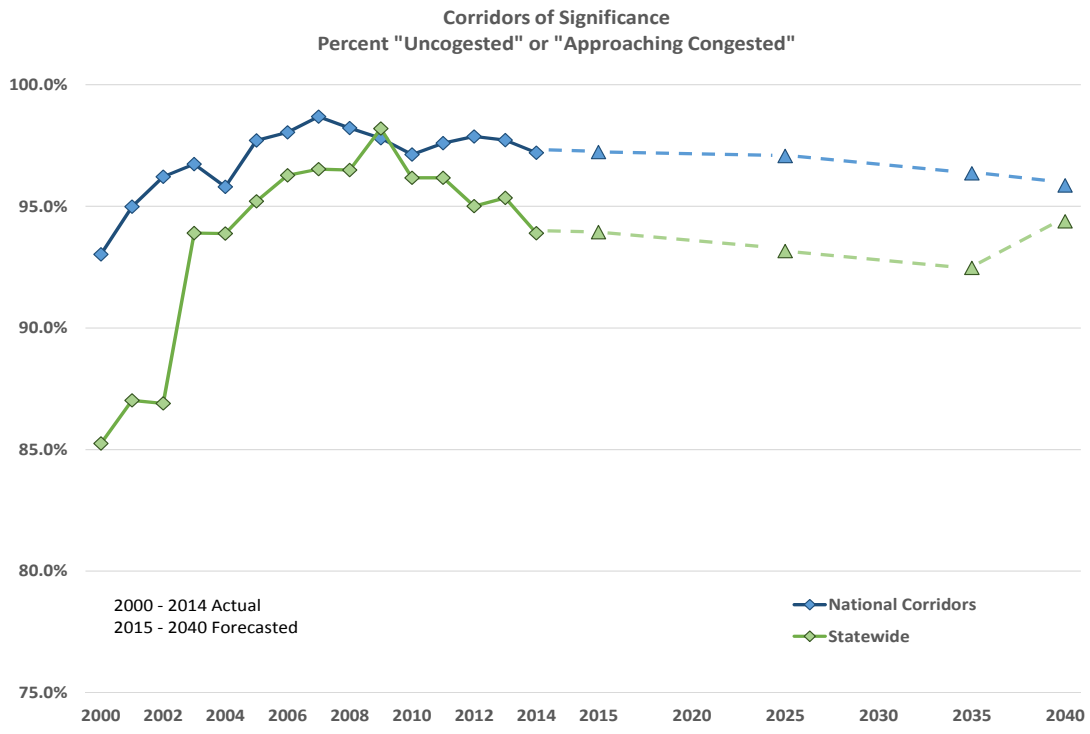
LOS Cost-to-Cure | LOS Data | LOS Definitions | LOS Trends

Percent of Route Miles along Corridors of National/International Significance Operating at an Acceptable Level of Service (LOS) Details (4 of 4)



National Corridors of Significance as noted in this reporting is MDOT trunkline that has been classified to have a national/international significance.

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MichiVan Access

AIM:
Expand transportation system (MichiVan) access.

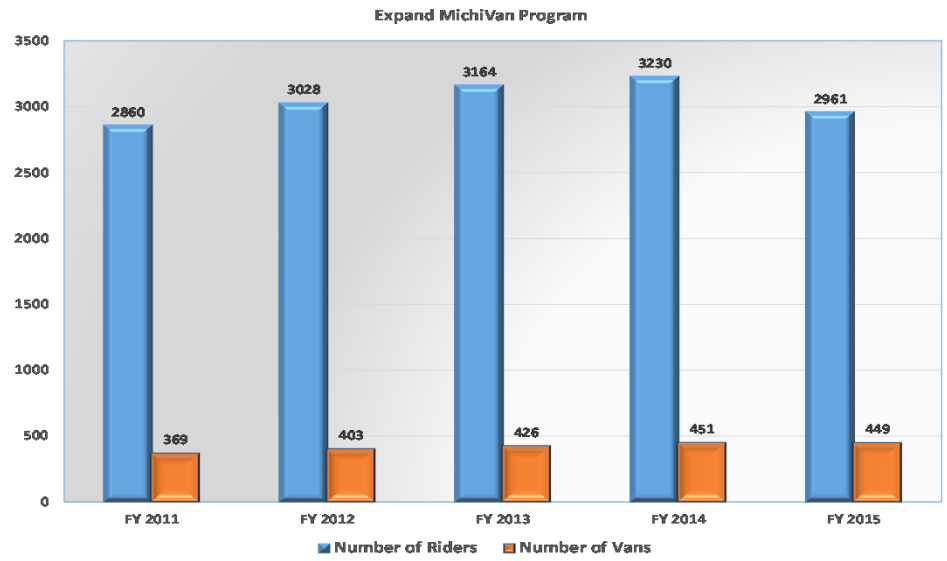
Measure:
Growth in MichiVan ridership and number of MichiVans in service.

Definition:
Comparative counts of riders and vans.

Standard:
Goal – Steady growth to match the increase in ridership and demand.

Status:
- MichiVan ridership decreased 9.1% between 2014 and 2015. Ridership increased 3.4% between 2011 and 2015.
- The number of vans decreased by 0.4% between 2014 and 2015. Vans increased 17.8% between 2011 and 2015.

Last Reported Status:
- MichiVan ridership increased 2.0% between 2013 and 2014. Ridership increased 18% between 2010 and 2014.
- The number of vans increased by 5.5% between 2013 and 2014. Vans increased 22.0% between 2010 and 2014.



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Traffic Incident Management

AIM:

Reduce Delays: Minimize disruption to mobility resulting from incidents.

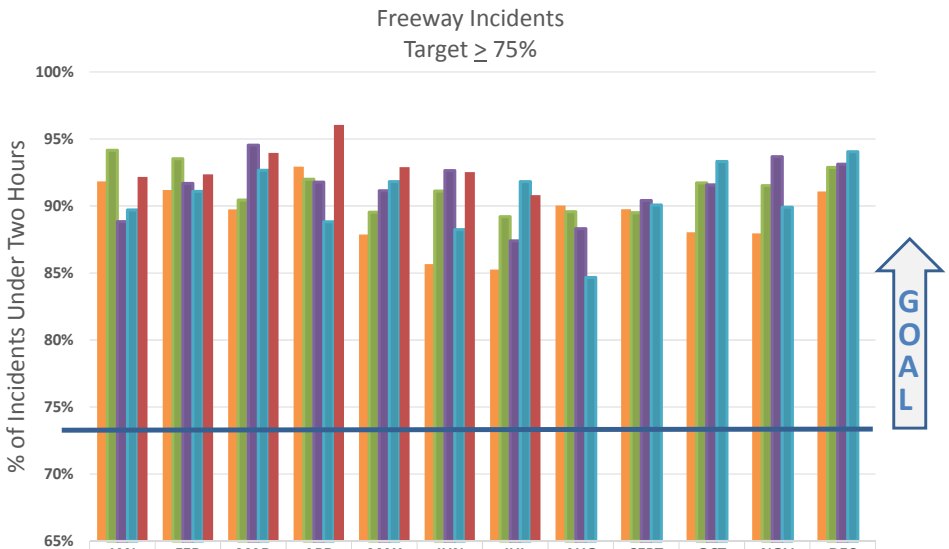
Measure:
Percentage of incidents under 2 hours.

Definition:
A traffic incident is an unplanned event that affects or impedes the normal flow of traffic. A traffic incident requires a response to protect life or property, and to mitigate its impacts. Traffic incidents, for example, include motor vehicle crashes, disabled vehicles, and other occurrences that require an emergency response.

Standard:
Target = Greater than 75% of freeway closures having a duration of less than 120 minutes.

Status:
The 2014 average of percentage of incident-related freeway closures less than 120 minutes is 90.5%.

Last Reported Status:
The 2013 average percentage of incident-related freeway closures less than 120 minutes was 91.3%.



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
2011	91.8%	91.2%	89.8%	92.9%	87.9%	85.7%	85.3%	90.0%	89.8%	88.0%	88.0%	91.1%
2012	94.2%	93.5%	90.4%	92.0%	89.5%	91.1%	89.2%	89.6%	89.5%	91.7%	91.5%	92.9%
2013	88.8%	91.7%	94.6%	91.8%	91.1%	92.6%	87.4%	88.3%	90.4%	91.6%	93.7%	93.1%
2014	89.7%	91.1%	92.7%	88.8%	91.8%	88.2%	91.8%	84.7%	90.1%	93.3%	89.9%	94.0%
2015	92.2%	92.4%	94.0%	96.1%	92.9%	92.5%	90.8%					

Click link to view: Traffic Incident Management Details

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Traffic Incident Definitions | Traffic Incident Data Collection | Freeway Courtesy Patrol

Traffic Incident Management Details (1 of 4)

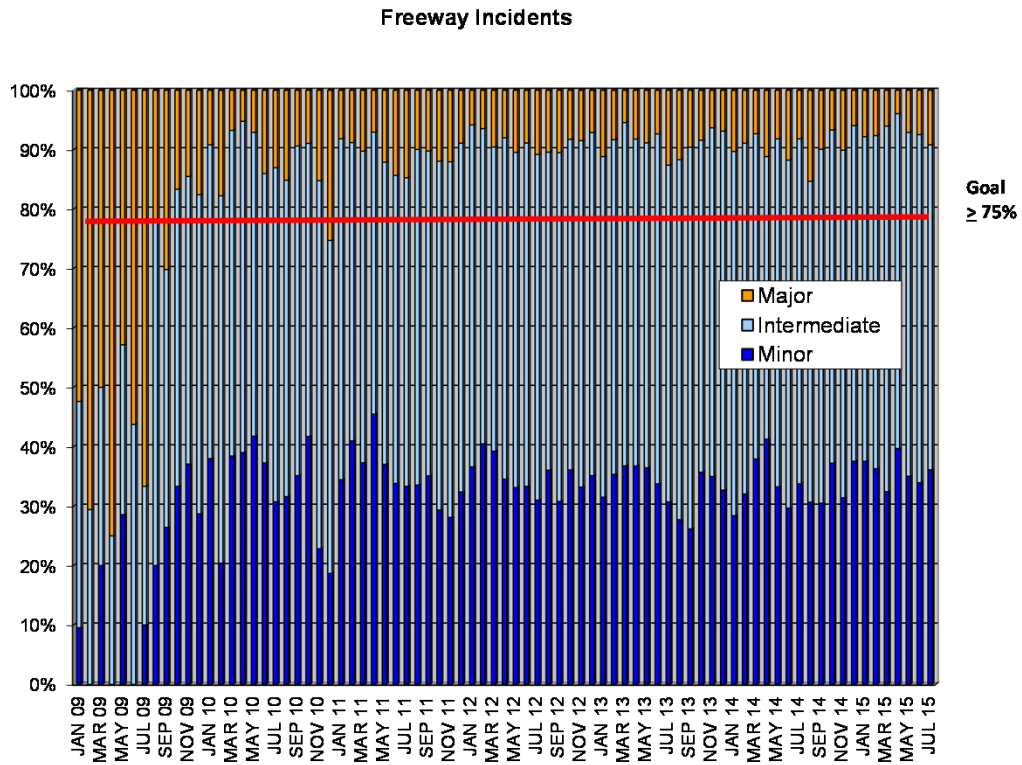
Definitions:

Clearance Time:
Clearance Time is defined as, "The time between the first recordable awareness of an incident by a responsible agency and the first confirmation that all lanes are available for traffic flow."

Minor Incident:
An incident that affects or impedes the normal flow of traffic for less than 30 minutes.

Intermediate Incident:
An incident that affects or impedes the normal flow of traffic for 30 minutes or more but less than 120 minutes.

Major Incident:
An incident that affects or impedes the normal flow of traffic for more than 120 minutes.



Traffic Incident Management Details (2 of 3)

Data Collection:

Data is collected from numerous sources including:

- Incident management logs from MDOT Transportation Service Centers (TSCs) and regions.
- Form 1506 (Notification Of Traffic/Roadway Incident Or Major Event) submittals.
- Statewide law enforcement UD-10 Traffic Crash Reports.
- Direct observations.
- Media reporting.
- The Southeast Michigan Transportation Operations Center (**SEMTOC**).
- The West Michigan Transportation Operations Center (**WMTOC**).
- The Statewide Transportation Operations Center (**STOC**).
- Trusted sources of social media.

Month	Year	Total Reported Incidents	Incidents w/ Reported Duration	Incidents w/o Reported Duration	Minor Incident (<30 minutes)		Intermediate Incident (between 30 and 120 minutes)		Major Incident (>120 minutes)		% of Incidents Under 120 minutes
					Number	Percent	Number	Percent	Number	Percent	
July	2014	393	391	2	132	33.8%	227	58.1%	32	8.2%	91.8%
August	2014	454	450	4	138	30.7%	243	54.0%	69	15.3%	84.7%
September	2014	426	423	3	129	30.5%	252	59.6%	42	9.9%	90.1%
October	2014	421	419	2	156	37.2%	235	56.1%	28	6.7%	93.3%
November	2014	538	535	3	168	31.4%	313	58.5%	54	10.1%	89.9%
December	2014	387	386	1	145	37.6%	218	56.5%	23	6.0%	94.0%
January	2015	640	639	1	240	37.6%	349	54.6%	50	7.8%	92.2%
February	2015	736	733	3	266	36.3%	411	56.1%	56	7.6%	92.4%
March	2015	447	447	0	145	32.4%	275	61.5%	27	6.0%	94.0%
April	2015	456	456	0	181	39.7%	257	56.4%	18	3.9%	96.1%
May	2015	454	451	3	158	35.0%	261	57.9%	32	7.1%	92.9%
June	2015	495	495	0	168	33.9%	290	58.6%	37	7.5%	92.5%
July	2015	468	468	0	169	36.1%	256	54.7%	43	9.2%	90.8%

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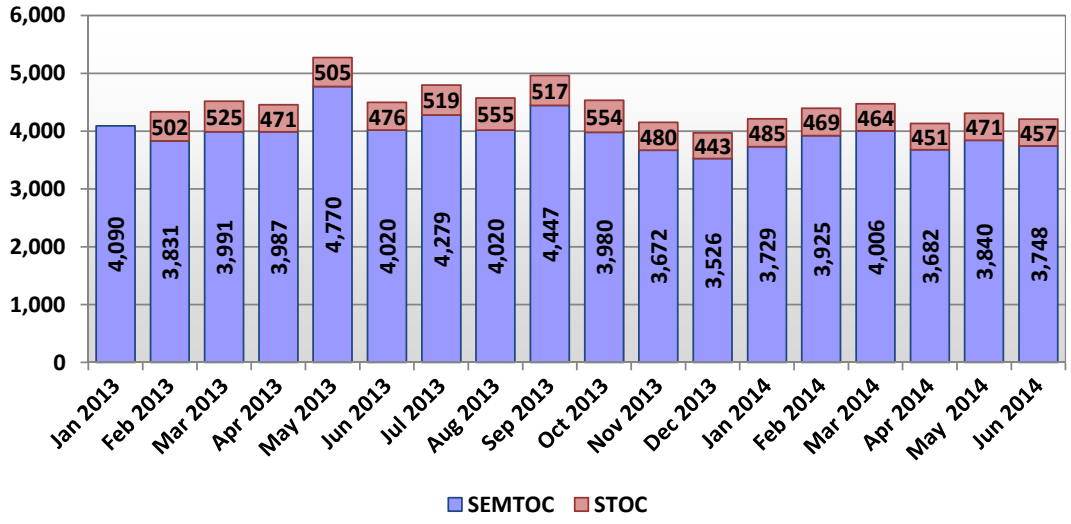
Traffic Incident Definitions | Traffic Incident Data Collection | Freeway Courtesy Patrol

Traffic Incident Management Details (3 of 3)

A specific tool that MDOT uses to minimize disruption to mobility resulting from incidents on the highway network is the Freeway Courtesy Patrol (FCP). Established in 1994 in the Detroit metropolitan area and newly expanded in February 2013 in the Ann Arbor and Brighton areas, the FCP assists stranded and distressed drivers in southeast Michigan as an integral part of the goal to reduce delays. In addition, the FCP provides assistance to motorists by reducing potential crash situations, relieving traffic congestion, and helping to create safer driving environments. For active people whose daily routines and obligations put them on the road, the patrol is an added measure of travel safety.

In the Detroit metropolitan area, the FCP fleet consists of 24 vans and employs 22 drivers, operate 24/7/365, and patrol over 300 miles of freeways In the Brighton and Ann Arbor areas, the FCP fleet consists of 2 vans and employs 2 drivers, operate 12 hours on weekdays and 8 hours on weekend days, and patrol over 70 miles of freeways. FCP drivers may find an assist during routine patrol or may be dispatched to an assist by a control room operator out of the Southeast Michigan Transportation Operations Center (SEMTOC) or the Statewide Transportation Operations Center (STOC). When the drivers are dispatched, response and clear times are recorded to ensure that assists are executed in an efficient manner.

Services are funded by MDOT through a grant from the Federal Highway Administration. MDOT manages the program through the SEMTOC and STOC. Additional sponsors include the Michigan State Police, SEMCOG, and County Dispatch Centers who also provide insight to continually improve operations.



Month & Year	SEMTOC	STOC
Jan 2013	4,090	
Feb 2013	3,831	502
Mar 2013	3,991	525
Apr 2013	3,987	471
May 2013	4,770	505
Jun 2013	4,020	476
Jul 2013	4,279	519
Aug 2013	4,020	555
Sep 2013	4,447	517
Oct 2013	3,980	554
Nov 2013	3,672	480
Dec 2013	3,526	443
Jan 2014	3,729	485
Feb 2014	3,925	469
Mar 2014	4,006	464
Apr 2014	3,682	451
May 2014	3,840	471
Jun 2014	3,748	457

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The **Pavement Surface Evaluation and Rating (PASER)** method was developed by the University of Wisconsin for determining the condition of roads according to a uniform condition rating scale. PASER is based on sound engineering principles and measures visible "surface distress" at a 1:10 scale. Because it is one of the easiest and most inexpensive means of pavement rating, PASER is very widely-used, well-supported, and ideal for agencies of all sizes.

(click to close)

Carpool Parking L

AIM:
Maintain 90% of al

Measure:
PASER rating.

Definition:

Rating Scale		
Rating	**Label**	**Definition**
8 to 10	Good	Requires only routine maintenance
5 to 7	Fair	Requires capital preventive maintenance to reach good condition
1 to 4	Poor	Requires structural improvement to reach good condition

Standard:
90% in good or fair condition.

Status:
In 2014, 95% of carpool lot pavements are in good or fair condition.

Last Reported Status:
In 2013, 96% of carpool lot pavements were in good or fair condition.

Click link to view: **Carpool Parking Lot Condition Details**

Data is collected within MDOT:	**June - July**
Data is Updated on this website:	**August/September**

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What is a trunkline?

A trunkline is any highway or road under the jurisdiction of MDOT, and is generally marked with one of these symbols:

U.S. Route

State “M” Route

Interstate Route

(click to close)

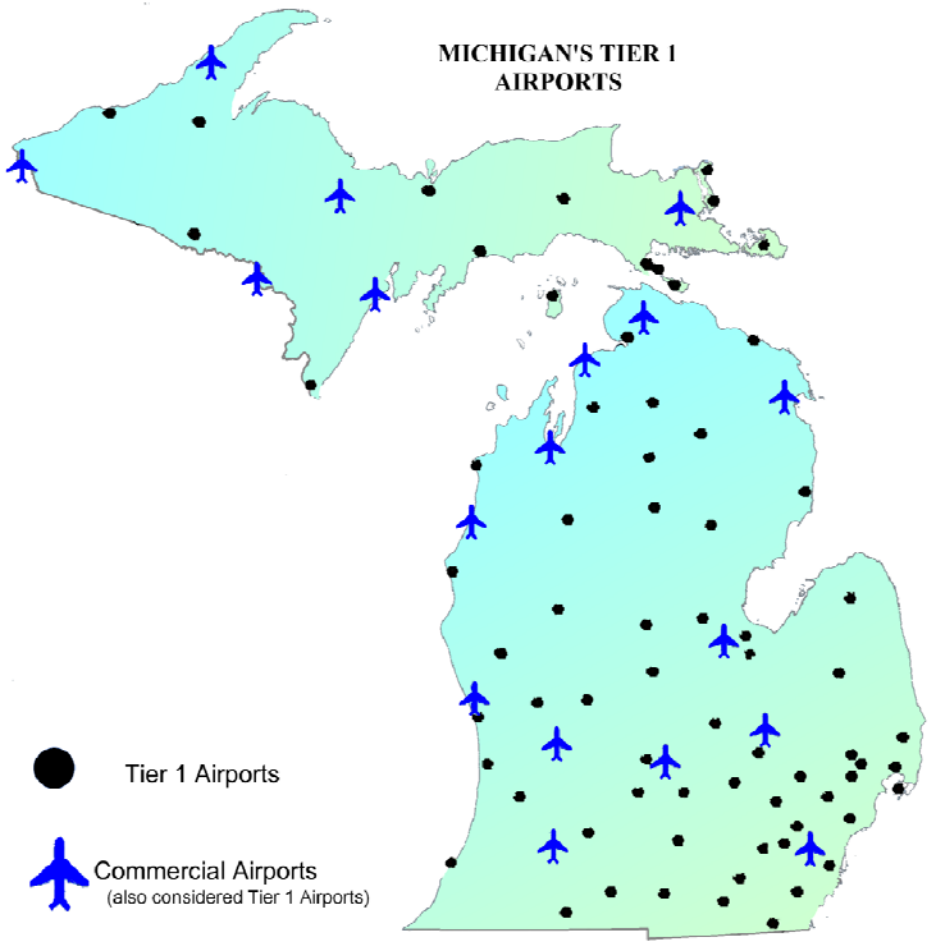
Tier 1 Airports Map | Tier 1 Airports A-F | Tier 1 Airports G-M | Tier 1 Airports N-Z

Tier 1 airports are those airports that respond to essential/critical state airport system goals.

Individual airport classification considers several airport development standards including:

- Primary Runway System
- Pavement Condition
- Lighting and Visual Aids
- Approach Protection
- Basic Pilot and Aircraft Services
- All-Weather Access
- Year-Round Access
- Landside Access

Airport tier designations can change based on revisions to state airport system goals and objectives, and at the discretion of the Michigan Aeronautics Commission. For more information click the link to view the Michigan Airport System Plan (**MASP**). See section 7 "Airport Development Standards."



City	Airports
Adrian	Lenawee County Airport
Allegan	Padgham Field
Alma	Gratiot Community Airport
Alpena	Alpena County Regional Airport
Ann Arbor	Ann Arbor Municipal Airport
Bad Axe	Huron County Memorial Airport
Battle Creek	W.K. Kellogg Airport
Bay City	James Clements Airport
Beaver Island	Beaver Island Airport
Bellaire	Antrim County Airport
Benton Harbor	Southwesr Michigan Regional Airport
Big Rapids	Robin-Hood Airport
Cadillac	Wexford County Airport
Caro	Tuscola Area Airport
Charlevoix	Charlevoix Municipal Airport
Charlotte	Fitch H. Beach Municipal Airport
Coldwater	Branch County Memorial Airport
Detroit	Coleman A. Young Municial Airport
Detroit	Grosse Ile Municipal Airport
Detroit	Detroit Metro- Wayne County Airport
Detroit	Willow Run Airport
Drummond Island	Drummond Island Airport
Escanaba	Delta County Airport
Flint	Bishop International Airport
Frankfort	Dow Memorial Airport
Fremont	Fremont Municipal Airport

City	Airports
Gaylord	Gaylord Regional Airport
Grand Haven	Memorial Airpark
Grand Ledge	Abrams Municipal Airport
Grand Rapids	Gerald R. Ford International Airport
Grayling	Grayling Army Airfield
Hancock	Houghton County Memorial Airport
Harbor Springs	Harbor Springs Municipal Airport
Harsens Island	Harsens Island Airport
Hillsdale	Hillsdale Municipal Airport
Holland	Tulip City Airport
Houghton Lake	Roscommon County-Blodgett Memorial Airport
Howell	Livingston County-Spencer J. Hardy Airport
Ionia	Ionia County Airport
Iron Mountain	Ford Airport
Iron River	Stambaugh Airport
Ironwood	Gogebic-Iron County Airport
Jackson	Jackson County-Reynolds Field
Kalamazoo	Kalamazoo/Battle Creek International Airport
Lambertville	Toledo Suburban Airport
Lansing	Capital Region International Airport
Linden	Price's Airport
Ludington	Mason County Airport
Mackinac Island	Mackinac Island Airport
Manistee	Manistee County-Blacker Airport
Manistique	Schoolcraft County Airport
Marine City	Marine City Airport
Marlette	Marlette Township Airport
Marquette	Sawyer International Aiport
Mason	Mason Jewett Field

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Tier 1 Airports Map | Tier 1 Airports A-F | Tier 1 Airports G-M | Tier 1 Airports M-Z

City	Airports
Menominee	Twin County Airport
Midland	Jack Barstow Airport
Mio	Oscoda County Airport
Monroe	Monroe Custer Airport
Mt. Pleasant	Mt. Pleasant Municipal Airport
Munising	Hanley Field
Muskegon	Muskegon County Airport
New Hudson	Oakland Southwest Airport
Newberry	Luce County Airport
Ontonagon	Ontonagon Countyshuster Field
Oscoda	Oscoda-Wurtsmith Airport
Owosso	Owosso Community Airport
Pellston	Pellston Regional Airport of Emmet County
Plymouth	Canton-Plymouth-Mettetal Airport
Point Aux Pins	Bois Blanc Island Airport
Pontiac	Oakland County International Airport
Port Huron	St. Clair CountyInternational Airport
Ray	Ray Community Airport
Rogers City	Presque Isle County/Rogers City Airport
Romeo	Romeo State Airport
Saginaw	Saginaw County H.W. Browne Airport
Saginaw	MBS International Airport
St. Ignace	Mackinac County Airport
Sault Ste. Marie	Chippewa County International Airport
Sparta	Paul C. Miller-Sparta Airport
Sturgis	Kirsch Municipal Airport
Tecumseh	Meyers-Diver's Airport
Traverse City	Cherry Capital Airport
Troy	Oakland/Troy Airport
West Branch	West Branch Community Airport

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