

PERFORMANCE MANAGEMENT AND THE TRANSPORTATION IMPROVEMENT PROGRAM

A key feature of the Fixing America's Surface Transportation (FAST) Act is the establishment of a performance and outcome based program, originally introduced through the Moving Ahead for Progress in the 21st Century (MAP-21) Act. The objective of a performance-based program is for states and MPOs to invest resources in projects that collectively will make progress toward the achievement of national goals. 23 CFR 490 outlines the seven areas in which performance goals are required, these include: Safety, Infrastructure Condition, Congestion Reduction, System Reliability, Freight Movement, Environmental Sustainability, and Reduced Project Delivery Delay.

Performance Targets

State Targets

Within one year of the United States Department of Transportation (US DOT) final rule on performance measures, States are required to set performance targets in support of those measures. States may set different performance targets for urbanized and rural areas. To ensure consistency each State must, to the maximum extent practicable:

- Coordinate with an MPO when setting performance targets for the area represented by that MPO; and
- Coordinate with public transportation providers when setting performance targets in an urbanized area not represented by an MPO. [§1202; 23 USC 135(d)(2)(B)].

The Statewide Transportation Improvement Program (STIP), State asset management plans under the National Highway Performance Program (NHPP), and State performance plans under the Congestion Mitigation and Air Quality Improvement program are required to include performance targets. Additionally, State and MPO targets should be included in Statewide transportation plans. 23 CFR 450.326 (c) and (d) require that (c) the TIP shall be designed such that once implemented, it makes progress toward achieving the performance targets established under §450.306(d) and (d) the TIP shall include, to the maximum extent practicable, a description of the anticipated effect of the TIP toward achieving the performance targets identified in the metropolitan transportation plan, linking investment priorities to those performance targets.

MPO Targets

Within 180 days of States or providers of public transportation setting performance targets, MPOs are required to set performance targets in relation to the performance measures (where applicable). To ensure consistency, each MPO must, to the maximum extent practicable, coordinate with the relevant State and public transportation providers when setting performance targets. MPO Metropolitan Transportation Plans (MTPs) and TIPs are required to include State and MPO targets.

Table 1: National Transportation Performance Measures

Area	Measures	Target Setting Status
Safety Performance	Number of fatalities; Rate of fatalities; Number of serious injuries; Rate of serious injuries; Number of non-motorized fatalities and non-motorized serious injuries	Approved adoption of statewide targets: February 2018
Pavement & Bridge Asset Management	Percent NHS Bridges in good and poor condition; Percent Interstate pavement in good and poor condition; Percent Non-Interstate NHS pavement in good and poor condition	Anticipated adoption in November 2018

System Performance & Freight	Interstate travel time reliability; Non-Interstate travel time reliability; Truck travel time reliability	Anticipated adoption in November 2018
Congestion Mitigation & Air Quality	Peak hour excessive delay per capita; Percent of non-single occupancy vehicle travel; Total emissions reduction	Anticipated adoption in May 2018
Public Transportation	State of Good Repair Targets; Public Transportation Agency Safety Plan: <ul style="list-style-type: none"> • Rolling Stock • Equipment • Facilities • Infrastructure 	State of Good Repair Targets reported in January 2018

KATS is currently working with the Michigan Department of Transportation, Federal Highway Administration, and the Federal Transit Administration to transition toward and implement a performance based approach to carrying out the Federal Highway program.

Current TIP Procedures for Selecting/Programming Projects and Addressing Performance Measures

Although specific federal guidance on performance measures had not been established at the time the 2045 MTP and the FY 2017-2020 Transportation Improvement Program were developed, the Kalamazoo Area Transportation Study (KATS) made efforts to collect data and begin tracking performance of the system. Through these documents, funding have been established that generally target the performance measure areas specified with project prioritization. Like other MPOs statewide, KATS has and continues to face limitations in funding resources at the local, state, and federal levels and has established goals and objectives in the MTP, particularly in the Financial Plan document to guide project selection.

During the TIP Call for Projects, road agencies are requested to submit a TIP application to be considered for funding. TIP applications are scored and prioritized on how well they address and incorporate pavement conditions, local and economic development elements, safety, and area-wide impacts. The 2020-2023 TIP applications will be revised to better emphasize performance measure targets using a more refined performance-driven project selection process, and will be documented in the new TIP. KATS will also continue to gather data for the development of performance measures such as pavement and bridge conditions, traffic volumes, level of congestion, freight data, air quality, emissions reductions, and crash data.

KATS will begin to analyze progress toward the performance goals in fiscal years 2018 and 2019 using the annual listing of obligated projects and forth coming Annual Performance Report to illustrate spending in each category (including bridges, safety, road restoration, non-motorized facilities, etc.) and status on performance. Obligated/completed projects will be evaluated to determine whether it contributes towards each performance goal. KATS will begin to fully implement these performance goals during the 2020-2023 TIP development process. Furthermore, staff will also continue to work with other MPOs on best practices for performance-based programing of projects and analysis of performance measure data.

Table 2: Prioritization Factors Related to Performance Measures

Area	Measures	Prioritization Factor
Safety Performance	Number of fatalities; Rate of fatalities; Number of serious injuries; Rate of serious injuries; Number of non-motorized fatalities and non-motorized serious injuries	<ul style="list-style-type: none"> • Crashes per MVMT/MEV • Project corrects identified safety issues and has correctable MVMT/MEV crash rate of 3 or higher
Pavement & Bridge Asset Management	Percent NHS Bridges in good and poor condition; Percent Interstate pavement in good and poor condition; Percent Non-Interstate NHS pavement in good and poor condition	<ul style="list-style-type: none"> • Pavement Surface Evaluation and Rating
System Performance & Freight	Interstate travel time reliability; Non-Interstate travel time reliability; Truck travel time reliability	<ul style="list-style-type: none"> • ADT/1000 rounded • National Functional Classification
Congestion Mitigation & Air Quality	Peak hour excessive delay per capita; Percent of non-single occupancy vehicle travel; Total emissions reduction	<ul style="list-style-type: none"> • Congestion Management Process • CMAQ Funding
Public Transportation	State of Good Repair Targets; Public Transportation Agency Safety Plan: <ul style="list-style-type: none"> • Rolling Stock • Equipment • Facilities • Infrastructure 	<ul style="list-style-type: none"> • State of Good Repair Targets reported in January 2017

*Additional information on Prioritization in Prioritization Chapter (page 21).

Public Transportation National Performance Goals

MAP-21 also mandated the Federal Transit Administration (FTA) to develop a rule establishing a strategic and systematic process of operating, maintaining, and improving public capital assets effectively through their entire life cycle. The Transit Asset Management (TAM) Final Rule 49 CFR part 625 became effective Oct. 1, 2016 and established four performance measures. The performance management requirements outlined in 49 CFR 625 Subpart D are a minimum standard for transit operators. Providers with more data and sophisticated analysis expertise are allowed to add performance measures and utilize those advanced techniques in addition to the required national performance measures.

1. Rolling Stock - means a revenue vehicle used in providing public transportation, including vehicles used for carrying passengers on fare-free services
2. Equipment - means an article of non-expendable, tangible property has a useful life of at least one year
3. Facilities - means a building or structure that is used in providing public transportation
4. Infrastructure - means the underlying framework or structures that support a public transportation system

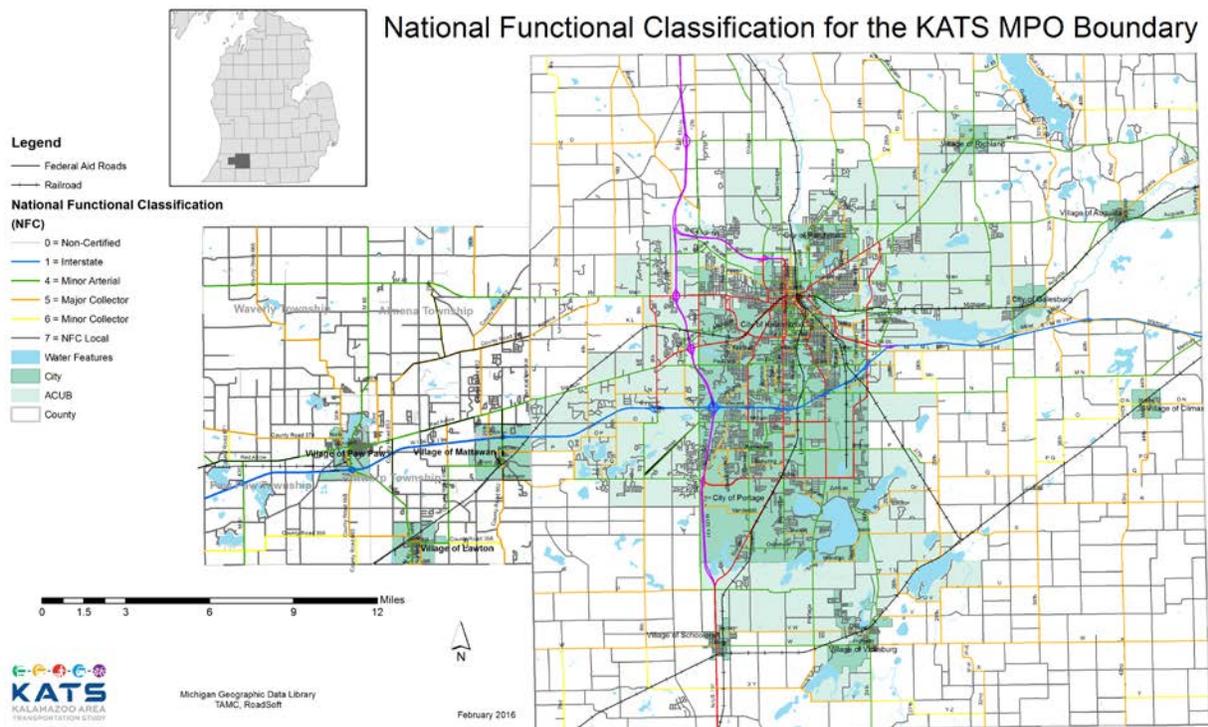
Public Transportation	State of Good Repairs; Public Transportation Agency Safety Plan: <ul style="list-style-type: none"> • Rolling Stock • Equipment • Facilities • Infrastructure 	<ul style="list-style-type: none"> • State of Good Repair Targets reported in January 2018 • TAM Plans due October 2018
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A full analysis and in depth discussion of targets will be done during the development of the next Metropolitan Transportation Plan which will take place in 2019, with adoption planned for April 2020.

Performance-Based Planning in the Kalamazoo Area Transportation Study

The KATS has several systems in place to address the mandated performance measures and targets. KATS maintains a traffic count program which has been integrated into a traffic count database system. This system is projected to facilitate improved data for the travel demand model with forecasts future traffic congestion. The MDOT sponsored collection of pavement condition data on federal-aid eligible roadways, through the statewide Asset Management program, provides KATS with data (both current and historic) to address the status of pavement conditions in the KATS area. MDOT also collects data through the Highway Performance Monitoring System (PMS). KATS has access to detailed traffic crash data for its area through the Crash Facts program of the Michigan State Police/Office of Highway Traffic Safety and RoadSoft.

Most of the performance targets are directed at the National Highway System, which is primarily under the jurisdiction of MDOT in the KATS area. Therefore, KATS will coordinate with MDOT (as set forth in the federal regulations) in the development of targets for roadways in the KATS area subject to the NHS-based performance. Any roadways designated as NHS which are under local jurisdiction are to be assessed in conjunction with the responsible local road agency, but separate targets are not expected to be established.



In the process of developing future Metropolitan Transportation Plans and Transportation

Improvement Programs once targets are established, KATS will assess the impact of any proposed projects on the performance measure areas (and targets), as noted at the beginning of this section. This will be done using the best available data at the time of assessment. Projects providing a high level of benefit in meeting identified performance targets will be considered for priority in programming.

MPO TARGET SETTING

Safety

The first performance measure for which specific targets were required is the safety category. On August 31, 2017, the Michigan Department of Transportation (MDOT) reported to Michigan’s metropolitan planning organizations (MPOs) that it had set safety targets for calendar year 2018. MDOT and Michigan’s MPOs had been meeting prior to this announcement over a period of several months to discuss the setting of these performance measures. The state establishment of safety targets set in motion the clock for MPOs to decide upon their MPO safety targets within 180 days after that date, or by February 27, 2018. On January 24, 2018, the KATS Policy Committee voted to exercise its option to “support the state targets” for the 5 categories of safety information. Safety targets are required to be developed by the state and responded to by the MPOs each year.

Table 3: Michigan Crash Trends; 2012-2016

	2012	2013	2014	2015	2016
Fatalities	936	951	876	963	1,064
Serious Injuries	4,540	4,311	4,045	3,939	4,565
Non-Motorized Fatalities & Serious Injuries	666	714	668	709	704

Table 4: Michigan State Safety Targets - Calendar Year 2018

Safety Performance Measure	Baseline through Calendar Year 2016	Calendar Year 2018 State Safety Target
Fatalities	963.0	1,003.2
Fatality Rate	1.00	1.02
Serious Injuries	5,273.4	5,136.4
Serious Injury Rate	5.47	5.23
Non-Motorized Fatalities & Serious Injuries	721.8	743.6

Michigan State Safety Targets are based on a five year rolling average from calendar year 2012 to 2016. The MDOT state safety targets for calendar year 2019 will be set by the state by August 31, 2018 and the MPOs will have 180 days following that date to set their 2019 targets. KATS has limited access to federal safety funds provided to the state.

A regional traffic safety plan was completed for a five county region of southwest Michigan by a consultant retained by MDOT. One result of the Southcentral Regional Traffic Safety Plan was the recommendation that safety projects target certain emphasis areas of traffic safety. The identification of the emphasis areas was based on an analysis of regional and local safety conditions, historical trends, and stakeholder input. The four highest priority emphasis areas were: lane departure, intersection safety, pedestrian and bicycle safety, and drivers age 24 years and younger. The results of the regional review were reported by county. KATS was able to break-out the KATS data individually for the provided data set for Kalamazoo County, however, it is not possible to break-out the four township

area of Van Buren County. KATS will evaluate the identification of potential high risk areas, segments, and intersections identified in the appendices of the Plan as locations needing further evaluation.

In the Southcentral Regional Traffic Safety Plan, the consultant identified intersection and segment data that had an excess of “expected” fatal and injury crashes on an annual basis when examining the 2010-2014 crash data. The locations were ranked as low, medium, and high for this criteria. The number of excess crashes to be expected for each of the categories was identified as: high = greater than 5, medium = 3 to 5, and low = 1 to 3.

Table 5: Local Safety Funding in FY 2017-2020 TIP

2017 Total Revenue	2018 Total Revenue	2019 Total Revenue	2020 Total Revenue
\$1,052,692	\$1,362,126	\$1,987,148	Not Programmed

Pavement

Federal regulations require that states measure, monitor, and set goals for pavement performance based upon a composite index of metrics. The four pavement condition metrics are: International Roughness Index (IRI), Cracking Percent, Rutting, and Faulting as reported by each state to the Highway Performance Monitoring System (HPMS) database. IRI and cracking percent are metrics for all road types. Rutting is only applicable to asphalt pavements and faulting is only measured for jointed concrete pavements. The rule applies to the entire National Highway System (NHS), which includes Interstate and Non-interstate NHS. MDOT is responsible for approximately 5,931 through-lane miles of interstate in Michigan, as of 2016. The Non-Interstate portion of the system includes MDOT trunkline routes (M-routes) (about 11,959 miles in 2016) and local government owned non-trunkline roads (about 4,239 miles in 2016). Local agencies are responsible for 19% of the NHS route mileage in Michigan.

2017 NHS Inventory (miles of through lanes of pavement)

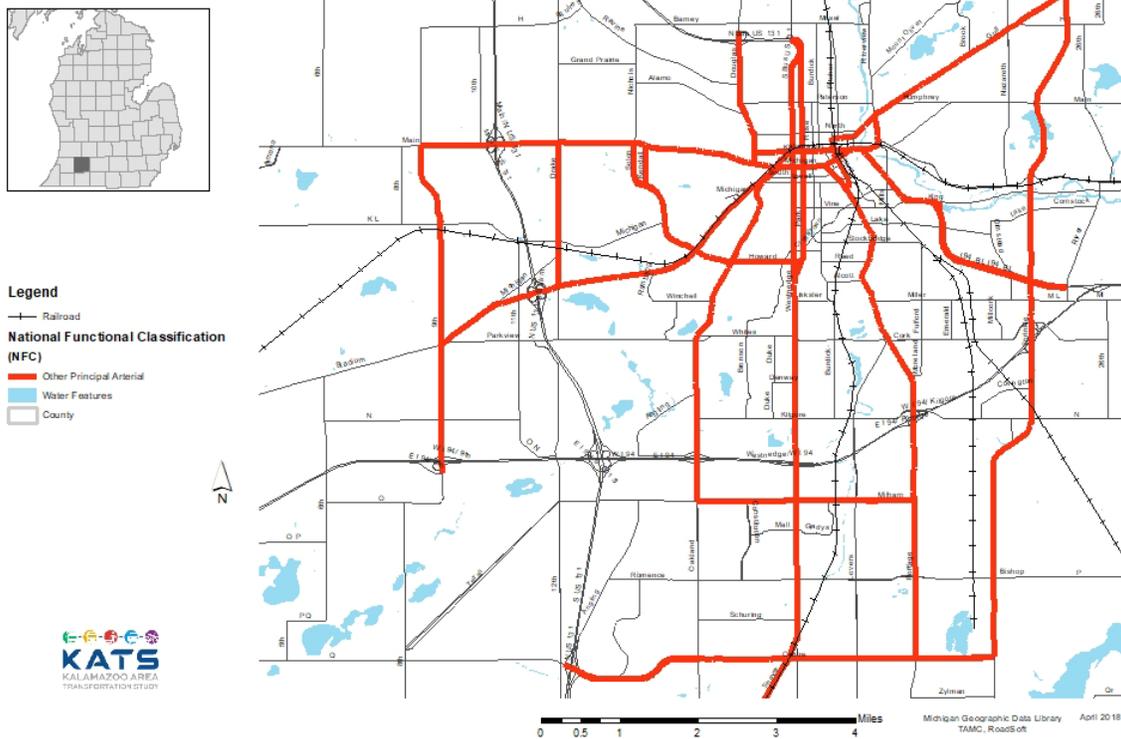
	Interstate	Non-Interstate	Trunkline Non-Interstate	Non-Trunkline Non-Interstate	Total NHS Miles
KATS MPO	157.49	378.89	215.09	163.79	536.38
Statewide	6,079.70	16,352.27	12,081.56	4,270.71	22,431.97

2017 Non-Interstate NHS IRI

	Good	Fair	Poor
KATS MPO	33.4%	44.3%	22.3%
Statewide	49.7%	31.6	18.6%

MDOT will be establishing 2-year and 4-year targets for a 4-year performance period for pavement condition on the National Highway System (NHS) in response to the federal regulations. The 4-year performance period includes January 1, 2018 to December 31, 2022. MDOT’s first target reporting is due on May 20, 2018. In addition, biennial progress reports are to be submitted to FHWA. There are a total of three progress reports due within the 4-year performance period: a Baseline Performance Report due October 1, 2018; a Mid-Performance Period Progress Report due October 1, 2020; and a Full Performance Period Progress Report due October 1, 2022. FHWA will determine if significant progress has been made from report to report. Based on the metrics described above and the rating of roads along a metric value range, there are four measures that will be used to assess pavement condition: % of Interstate road pavement in “Good” condition; % of Interstate road pavement in “Poor” condition; % of Non-interstate NHS pavement in “Good” condition; and % of Non-interstate NHS pavement in “Poor” condition.

Local National Highway System for the KATS MPO Boundary



MPOs are required to establish four-year targets for these measures. As with the other performance measures, there is the option to agree to plan and program projects that support MDOT’s targets, or establish their own targets for their Metropolitan Planning Area (MPA). MPO targets for pavement are due November 16, 2018.

Bridge

The federal performance measures require that state DOT’s establish 2-year and 4-year targets for a 4-year performance period for the condition of infrastructure assets. State DOT’s will establish their first statewide targets by May 20th, 2018. As with the pavement condition reporting, state DOTs are required to submit three performance reports to FHWA within the 4- year performance period: a Baseline Performance Report by October 1, 2018; a Mid- Performance Period Progress Report by October 1, 2020; and a Full Performance Period Progress Report by October 1, 2022. The two performance measures for assessing bridge condition are: % of National Highway System (NHS) bridges in “Good Condition”; and % of NHS bridges in “Poor Condition”.

The MPOs will establish targets by either supporting MDOT’s statewide target(s), or defining a target unique to the metropolitan area each time MDOT sets a target. As part of the Full Performance Period Progress Report, the MPOs will report their established targets, performance, progress, and achievement of the targets to MDOT in a manner that is agreed upon by both parties and documented in the Metropolitan Planning Agreement. MPOs are not required to report separately to FHWA.

KATS supports the maintaining of NHS and local bridges within its area. However, bridge funding is administered at the state level by MDOT. MDOT evaluates bridges on interstate and state trunkline routes for necessary projects and funding. A statewide Local Bridge Advisory Board allocates funds for the Michigan Local Bridge Program based on available funds and weighted ratios. In 2016, only 89 of 363 submitted local bridge projects could be funded due to budget constraints. As of June, 2017, approximately 2 million square feet of locally owned bridges in Michigan have deck area in poor, serious,

or critical condition. This translates to the local agencies in Michigan having 17% of NHS bridge deck area under their jurisdictions in poor condition. This exceeds the penalty threshold of no more than 10% of NHS bridges, measured by deck area, being classified as structurally deficient. MDOT's NHS bridge condition by deck area is only slightly under the 10% threshold, at 9% poor condition.

MDOT is projecting "condition improvement" for the NHS bridges in the state based on projects programmed through the MDOT and local bridge programs described above. Deterioration is estimated based on comparing network wide deterioration rates to the age and condition of each major component of each structure.

The targets are highly dependent on the deck area of bridges that fall to poor, and so the smaller the inventory considered, the higher potential for a single bridge to skew results. The statewide targets are assumed to be less variable than for an individual MPO. Therefore, it is most likely that the Kalamazoo Area Transportation Study will elect to support the state bridge targets later in fall of 2018.

MDOT's bridge targets will be added to this section once they are established in May, 2018. KATS will have until November, 2018 to either support the state targets or establish independent MPO targets.

System Performance of the NHS and Freight

The Michigan Department of Transportation is assessing the best way to address the travel time reliability measure associated with interstate travel, non-interstate NHS travel, and truck travel. The state has not yet set targets for this category. It is anticipated that MPOs will be addressing this measure in the fall of 2018.

Transit Performance Measures and Targets

There are two transit providers in the KATS area. Metro is a direct recipient of funds from the Federal Transit Administration. As such, Metro is identified as a Tier II recipient under the current federal legislation and had developed state of good repair targets. The Metro 2018 state of good repair targets are as follows:

Table 6: Transit State of Good Repair Targets for 2018

Asset Class	Current Condition	Current Condition Actuals	2018 Target
Revenue Vehicles			
Line-Haul Buses	97.5% of buses are 15 years old or newer	39 of 40 Buses	92.5% of buses are 15 years old or newer
Medium Duty Buses (Metro Connect)	82.4% of buses are 10 years old or newer	14 of 17 Buses	88% of buses are 10 years old or newer
Van (Metro Connect)	81.3% of vans are 8 years old or newer	26 of 32 Vans	90% of vans are 8 years old or newer
Vans (Metro Share)	100% of vans are 12 years old or newer	11 of 11 Vehicles	90% of vans are 12 years old or newer
Service Vehicles	90.9% of vehicles are 12 years old or newer	10 of 11 Vehicles	90% of service vehicles are 12 years old or newer
Facilities	To be Determined	Assessment of facilities is being conducted using FTA Transit Economic Requirements Model (TERM) rating scale	85% at or above 3.0 on FTA Transit TERM rating scale

Also required is a Transit Asset Management (TAM) Plan and a Transit Agency Safety Plan. Metro will have its TAM Plan completed by the October 1, 2018 deadline for compliance with that requirement. The

federal rulemaking for the transit safety plans is expected to be released no later than April 25, 2018, after which time, state and local steps will be taken to comply with those rules.

The other transit agency in the KATS area is located in Van Buren County. Van Buren Public Transit follows state TPM guidance for sub-recipients. Conditions and targets are based on the Useful Life Benchmark (ULB) set by the Federal Transit Agency (FTA).

Table 7: Rural State of Good Repair Targets for 2018

(For MDOT Section 5311 and 5310 sub-recipients)

Asset Class	Current Condition	2018 Target	Plus
Revenue vehicles: small bus and van class	9% of 5311 past ULB 0% of 5310 past ULB	Not more than 9% will meet or exceed the FTA ULB	Not more than 25% of each agency's fleet will meet or exceed the ULB
Revenue vehicles: large bus class	17% of 5311 past ULB 0% of 5310 past ULB	Not more than 15% will meet or exceed the FTA ULB	Not more than 25% of each agency's fleet will meet or exceed the ULB
Service vehicles	Uncertain (an unknown percentage are retired revenue vehicles, so determining what ULB is appropriate requires additional data/research)	100% may meet or exceed the FTA ULB	Funds available for asset investment in 2018: - Section 5339: \$1.75 million allocated to MDOT. - Section 5310: \$2.0 million (55% of the rural and small urban funds allocated to MDOT. - State match to the above.
Facilities – all classes	Unknown	100% may be below a 3.0 rating on the FTA TERM scale	- Total: \$4,687,500 All available funds will be focused on revenue vehicle replacement

Congestion Management Process

The Congestion Management Process (CMP) for the Kalamazoo Area Transportation Study is a regionally accepted, systematic approach for managing congestion. It is a multi-modal approach to assess alternative strategies for congestion management and move these strategies into the funding and implementation stages. The Congestion Management Process is a tool used by road and transit agencies to determine what level of capacity improvement is most suitable for a corridor and uses data from the KATS Travel Demand Model, verified and supported by real world data, to analyze submitted capacity improvement projects.

The KATS Congestion Management Process identifies four objectives based off the Goals identified in the 2045 KATS Metropolitan Transportation Plan:

Objective 1: Decrease model based Vehicle Hours Traveled (VHT) by 5% by 2040.

Objective 2: Promote an increase in non-motorized commuting by increasing the access (mileage) to non-motorized facilities by 10% by 2040.

Objective 3: Increase or upgrade the number of corridors by 10% on the CMP network using modern Intelligent Transportation Systems (ITS) by 2040 to improve intersection performance.

Objective 4: Improve average on-time (real world) performance for transit routes located on the CMP network by 10% by 2040.

KATS works with local communities as they implement congestion mitigation strategies in their project development. Congestion solutions range from low cost education campaigns and travel demand management strategies to high cost travel lane expansion.

Congestion is often a subjective determination; it can be recurring (rush hour traffic) or event- driven (a traffic crash). Transportation planners use metrics such as level of service to evaluate the efficiency of a road or intersection. In the KATS Metropolitan Area, congestion is most significant in the morning

and evening periods as people commute to and from work. The congestion issues in the KATS Metropolitan Area are largely caused by the amount of single occupant vehicles on the road, not by the amount of people traveling along a corridor. Efficient use of previous and future investments requires a focus on moving the greatest number of people in the least amount of space. This concept is demonstrated in the image below where the space required for 60 people to travel is compared by mode.



Improvements that address congestion should consider multiple options before increasing automobile capacity, per the KATS Congestion Management Process. Alternative congestion management techniques include transportation demand management, creating attractive transportation options, and traffic operations improvements. While alternative transportation improvements may not completely alleviate congestion, they do provide travelers a real choice between sitting through heavy traffic while in a car or moving along via bicycle or enhanced transit, all while helping alleviate congestion issues. A more detailed look at Congestion and the goals associated with its management can be found in the KATS Congestion Management Process document.

National Highway System (NHS) Asset Management Plan

MDOT is required to develop an Asset Management Plan for the NHS that includes:

- Pavement and bridge inventory and conditions on the NHS
- Objectives and measures
- Performance gap identification
- Life-cycle cost and risk management analysis
- Financial plan
- Investment strategies

The USDOT has set minimum standards for states to use in developing and operating bridge management systems and pavement management systems.

A Metropolitan System Performance Report is required in the long range Metropolitan Transportation Plan (MTP). The next update of the KATS MTP is scheduled to commence in FY 2019, with Policy committee approval planned by April 2020.