Battle Creek Area Transportation Study (BCATS)
System Performance Report

According to the FAST Act, a long-range transportation plan needs to include a system performance report (SPR) and subsequent updates evaluating the condition and performance of the transportation system with respect to the performance targets. The information should include progress achieved by the MPO in meeting the performance targets in comparison with system performance recorded in previous reports, including baseline data. The long-range transportation plan will provide information on the current and proposed target information adopted by MDOT for roads, highways and transit. Updates to target data will be reflected on the BCATS website.

Roads and Highways Reporting Requirements

MDOT is required to report to FHWA on the establishment of state performance targets and the progress made in attaining the state targets on biennial basis (October 1 of each even numbered year). One exception to the biennial reporting requirements is for the safety performance measures, which are required to be reported by MDOT to FHWA through the Highway Safety Improvement Program Annual Report by August 31 of each year.

MPOs are not required to provide annual reports other than MPO decisions on targets. MPOs are required to report MPO performance targets to MDOT in accordance with the documented procedures. This will result in MPOs reporting MPO safety targets annually to MDOT, and other performance targets as they are established (every two or four years).

2022 Safety Targets – Road and Highways

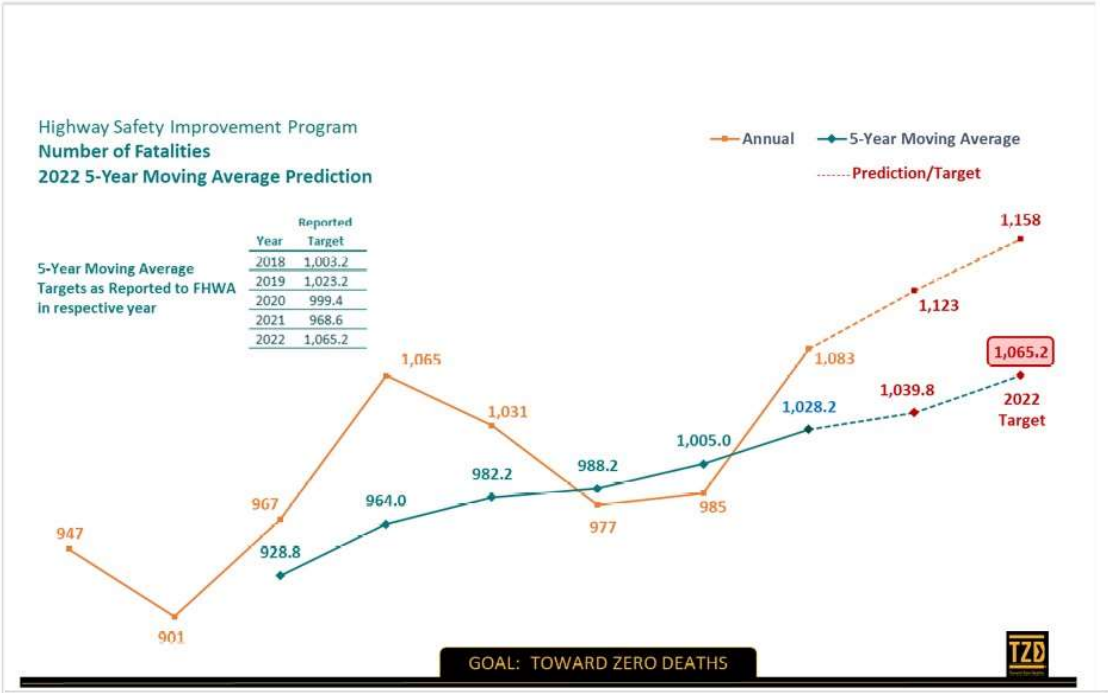
Federal regulations require the use of five-year rolling averages for each of the performance measures which include Fatalities, Fatality Rate per 100 million VMT, Serious Injuries, Serious Injury rate per 100 million VMT, Non-Motorized Fatalities and Serious Injuries. The charts for 2021 and 2022 estimates were provided by MDOT.

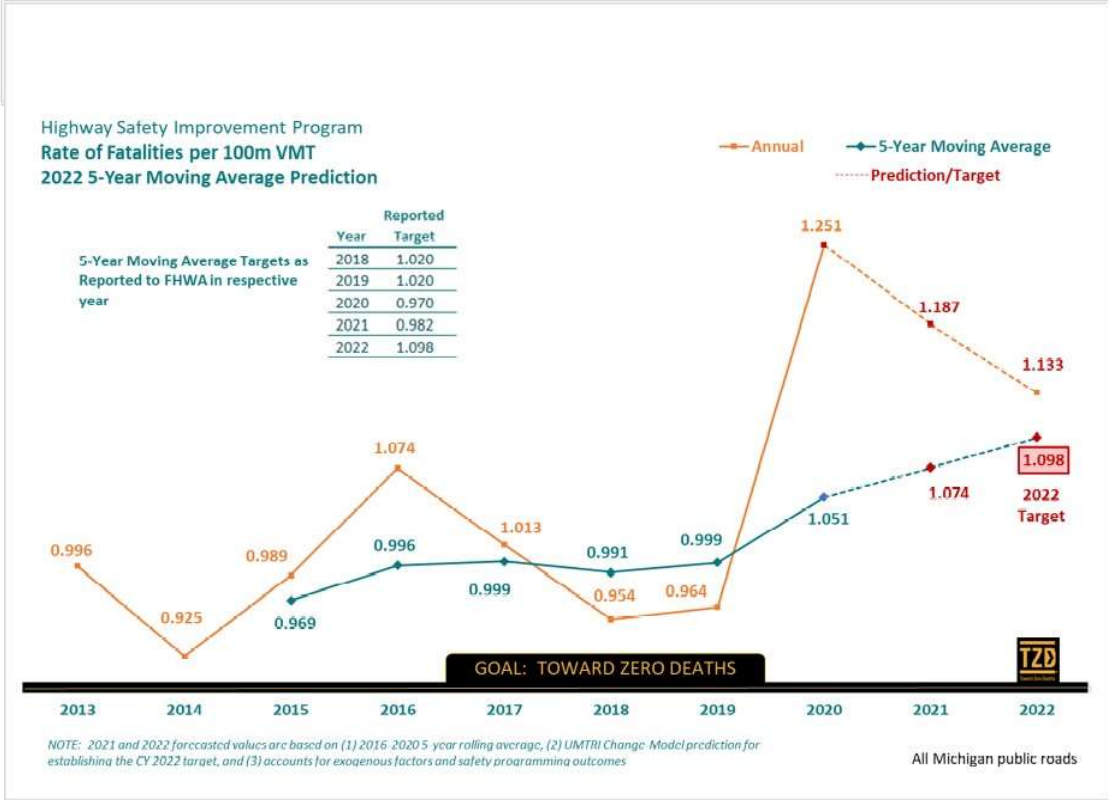
Total Fatalities & Fatalities Rate

How Targets Are Set

MDOT and Office of Highway Safety Planning used two different models to forecast the total fatalities and serious injuries for target setting. The fatality models developed by MDOT relied on the relationship between oil prices, the Dow Jones Industrial (DJI) futures and fatalities. The price of oil and the level and changes in the DJI futures are closely correlated to the travel demand and traffic crashes. The second model was developed and maintained by the University of Michigan Transportation Research Institute (UMTRI). The UMTRI model relies on results of a recently completed research report titled *Identification of Factors Contributing to the Decline of Traffic Fatalities in the United States.* The model relies on the correlation between traffic crashes and vehicle miles traveled (VMT), Gross Domestic Product (GDP) per capita, median annual income, and the unemployment rate among 16–24-year-olds.

To determine the forecasted five-year rolling average for Fatalities, Fatality Rate per 100 million VMT, Serious Injuries, and Serious Injury Rate per 100 million VMT, the forecast was obtained from the models for 2021 and 2022. The final forecasted value for fatalities is the average of MDOT and UMTRI forecasted values which predicts a final number of 1,123 in 2021 and 1,158 in 2022. The target for calendar year 2022 is 1,065.2 for fatalities and 1.098 for fatality rate, which are shown in the following charts.





Reporting Requirements

MDOT is required to report to FHWA on the establishment of state performance targets and the progress made in attaining the state targets on a biennial basis (October 1st of each even numbered year). One exception to the biennial reporting requirement is for the safety performance measures, which are required to be reported by MDOT to FHWA through the Highway Safety Improvement Program Annual Report by August 31st of each year.

State Actions

- To meet the safety goal of reducing fatalities and serious injuries on the state trunkline system, the strategy of the Safety Program is to select cost-effective safety improvements, as identified in Michigan's Strategic Highway Safety Plan (SHSP), to address trunkline locations with correctable fatality and serious injury crashes.
- All proposed safety funded improvements must be supported by the MDOT Region's Toward Zero Deaths Implementation Plan to mitigate crashes within the area. Priority is given to those projects with SHSP focus area improvements that have the lowest cost/benefit analysis or are a proven low-cost safety improvement to address the correctable crash pattern.
- On the local road system, MDOT administers federal safety funds for safety improvements supported by a Local Road Safety Plan or addressed by means of a low-cost safety project. High Risk Rural Road is one program used to address rural roadways where fatalities and serious injuries exceed the statewide average for that class of roadway.

MPO Actions

- As shown in the table below, the Battle Creek MPO supported the adoption of MDOT's State Targets for Safety Performance Measures for Calendar Year 2022 in September 2021. This established targets for performance measures based on five-year rolling averages, including:
    - Number of Fatalities,
    - Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT).

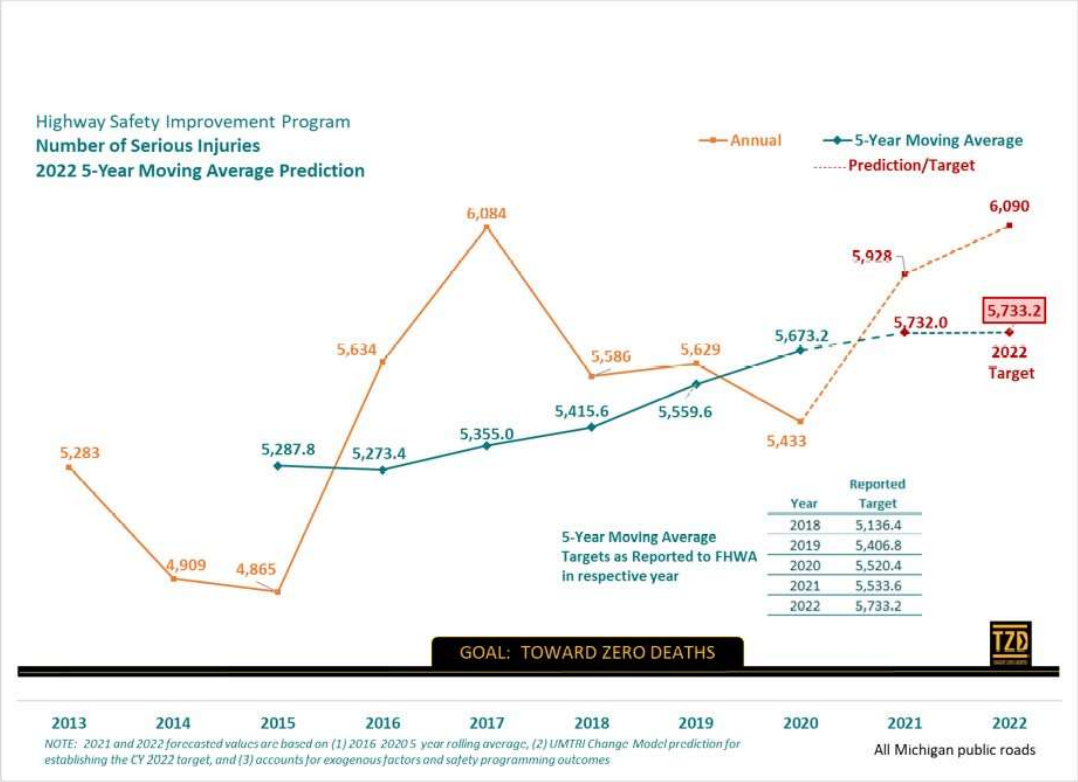
Michigan State Safety Targets for Calendar Year 2022		
Safety Performance Measure	**Baseline Condition**	**2022 Targets**
Fatalities	1,039.8	1,065.2
Fatality Rate	1.074	1.098

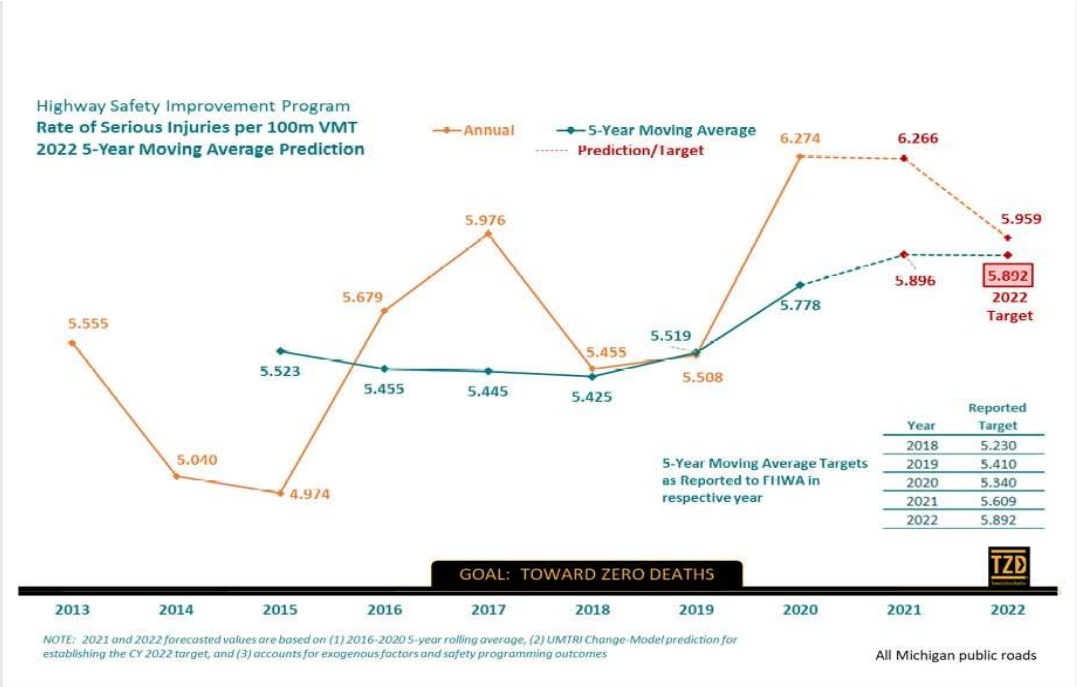
- Give priority in the Transportation Improvement Program (TIP) to projects that address safety.
- Encourage Act 51 Agencies to apply for local safety funds for all available categories of projects which address safety concerns within the BCATS area.
- Promote safe travel habits for all users of the transportation system through education opportunities.

Total Serious Injuries & Serious Injuries Rate

How Targets are Set

The UMTRI model was the sole model used in forecasting total serious injuries as it exhibited a strong linear relationship of the ratio of serious injuries and fatalities (A/K). The forecasting total for serious injuries is 5,928 in 2021 and 6,090 in 2022. The target for calendar year 2022 is 5,733.2 for serious injuries and 5.892 for serious injury rate.





State Actions

- To meet the safety goal of reducing fatalities and serious injuries on the state trunkline system, the strategy of the Safety Program is to select cost-effective safety improvements as identified in Michigan's SHSP to address trunkline locations with the correctable fatality and serious injury crashes.
- All proposed safety funded improvements must be supported by the MDOT Region's Toward Zero Deaths Implementation Plan to mitigate crashes within the region. Priority is given to those projects within each Region, with SHSP focus area improvements that have the lowest cost/benefit analysis or are proven low-cost safety improvement to address the correctable crash pattern.
- On the local road system, MDOT administers federal safety funds for safety improvements supported by a Local Road Safety Plan or addressed by means of a low-cost safety project. High Risk Rural Road is one program used to address rural roadways where fatalities and serious injuries exceed the statewide average for that class of roadway.

MPO Actions

- As shown in the table below, the Battle Creek MPO supported the adoption of MDOT's State Targets for Safety Performance Measures for Calendar Year 2022 in September 2021. This established targets for performance measures based on a five-year rolling average, including:

    - Number of Serious Injuries.
    - Rate of Serious Injuries per 100 million VMT.

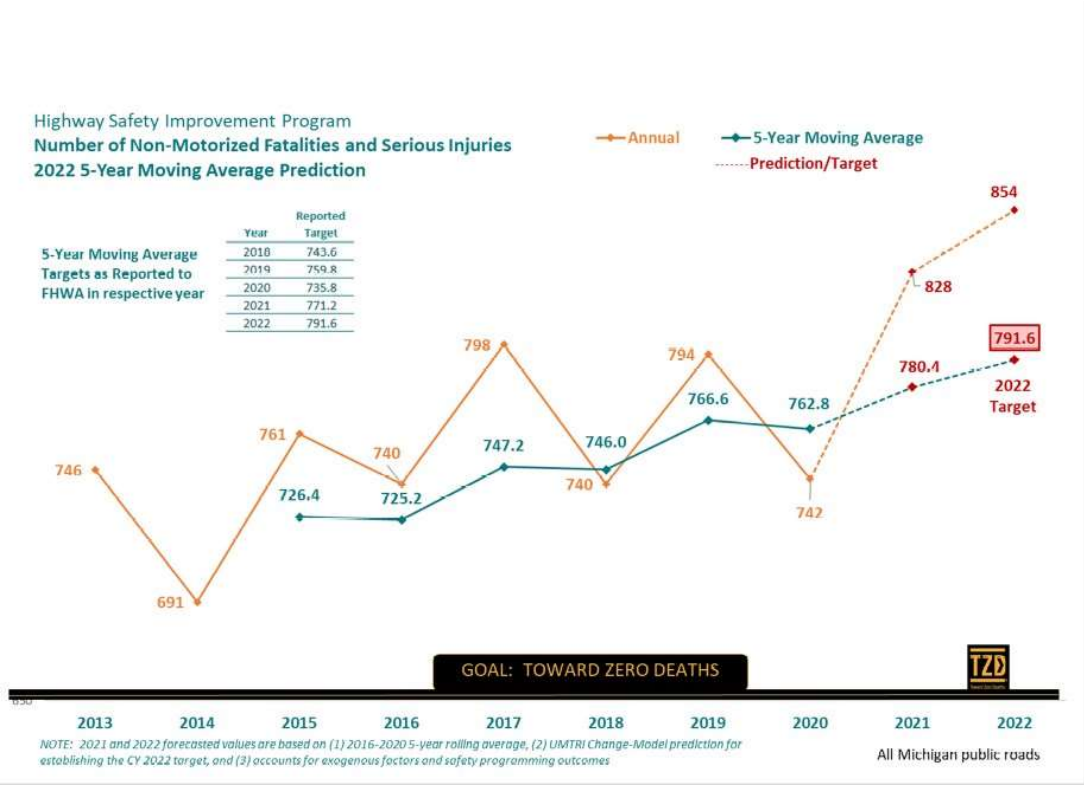
Michigan State Safety Targets for Calendar Year 2022		
Safety Performance Measure	**Baseline Condition**	**2022 Targets**
Serious Injuries	5,673.2	5,733.2
Serious Injury Rate	5.778	5.892

- Give priority in the TIP to projects that address safety.
- Encourage Act 51 Agencies to apply for local safety funds for all available categories of projects which address safety concerns within the BCATS area.
- Promote safe travel habits for all users of the transportation system through education opportunities

Total Bicycle & Pedestrian Fatality and Serious Injuries

How Targets Were Set

Results from the UMTRI model (the A/K relationship) were also used to generate forecasted 5-year moving average values for bicycle and pedestrian fatalities and serious injuries for 2021 and 2022. The forecasting total for fatalities and serious injuries is 828 for 2021 and 854 in 2022. The target for calendar year 2022 is 791.6 for fatalities and serious injuries.



State Actions

- Implement the recommendations of the MDOT University Region Non-Motorized Plan.
- MDOT continues to work with researchers to improve pedestrian and bicycle safety. Examples of current or past work include the development of gateway treatments for pedestrian and Michigan bicycle and pedestrian travel modes.
- MDOT supports Wester Michigan University's participation in the Roadway Safety Institute as part of the Region 5 University Transportation Center aimed at high-risk road users.
- MDOT also participates with UMTRI in the development of a risk model for non-motorized users, and with Wayne State University in research to further side-path safety.

MPO Actions

- As shown in the table below, the Battle Creek MPO supported the adoption of MDOT's State Targets for Safety Performance Measures for Calendar Year 2022. This established targets for performance measures based on five-year rolling averages, including the number of non-motorized fatalities and serious injuries.

Michigan State Safety Targets for Calendar Year 2022		
Safety Performance Measure	**Baseline**	**2022 Target**
Non-Motorized Fatalities & Serous Injuries	762.8	791.6

- Address safety issues, concerns, and needs for bicyclists and pedestrians in the development of the Metropolitan Transportation Plan (MTP) and the Transportation Improvement Program.
- Utilization of MDOT road safety audits and engineering countermeasures and other initiatives, programs or designs that are promoted as part of the Toward Zero Deaths National Strategy.

Battle Creek Area Transportation Study - Traffic Crash Statistics

Calendar Years 2016-2020

Year	Total Crashes	Bicycle Involved	Predestrian Involved	Fatalities/ Fatality Crashes	Serious Injuries/Crashes
2020	2,172	11	16	30/13	55/45
2019	2,672	15	8	23/11	35/32
2018	2,883	15	25	13/7	38/34
2017	2,729	9	20	27/12	59/53
2016	3,149	17	28	43/13	58/52
Total	13,605	67	97	136/56	245/216

Transit Reporting Requirements

The Federal Transit Administration Transit Asset Management Rule requires a Transit Asset Management (TAM) plan to set one or more performance targets for each applicable performance measure. The goal is to establish a strategic and systematic process of operation, maintaining, and improving public capital assets effectively through their entire life cycle. The targets should be based on realistic expectations, and the recent data available and the financial resources from all sources that area reasonably expected funding the TAM plan horizon period. The three asset classes to be in the Transit Asset Management plan are Revenue Vehicles, Equipment/Service Vehicles, and Facilities.

The targets for 2022 are reflective of the current status of the Battle Creek Transit (BCT) fleet. Although BCT received a significant Section 5339 grant for vehicle replacement in FY 2021, those vehicles will be phased in over time through FY 2028.

How Targets are Set

Battle Creek Transit annually sets State of Good Repair targets for its assets based on recent and anticipated capital funding available to updates to rolling stock, equipment/service vehicles, and facilities. Transit agencies in an urban area are required to develop targets for State of Good Repair. The purpose of the State of Good Repair is to establish a strategic and systematic process of operation, maintaining and improving public capital assets effectively through their entire life cycle.

The BCATS Policy Committee voted to support the 2022 BCT State of Good Repair targets at its meeting on January 26, 2022.

Battle Creek Transit "State of Good Repair" Targets for Calendar Year 2022

Asset Category – Performance Measure	Categories	2022 Target
REVENUE VEHICLES Age - % of revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark (ULB)	BU - Bus	76.92%
	MB - Mini-bus	57.14%
	MV - Mini	0%
EQUIPMENT Age - % of vehicles that have met or exceeded their Useful Life Benchmark (ULB)	Non-Revenue/Service Automobile	100%
	Trucks & other Rubber Tire Vehicles	75%
	Maintenance Equipment	0%
FACILITIES Condition - % of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale	Administration	50%
	Maintenance	50%
	Passenger Facilities	100%

An additional transit performance measure requirement from the FTA is the development of a Public Transportation Agency Safety Plan (PTASP) which sets Safety Performance Targets for the public transportation agency. The transit agency is to provide the PTASP, with targets, to the MPO when it is developed. Upon receipt of BCT's Plan and targets in July of 2020, the BCATS Policy Committee acknowledged receipt of the Plan and adopted a resolution acknowledging the intent to plan and program projects that contribute to the accomplishment of BCT's safety targets. The BCT safety targets, as reported to BCATS, are shown in the table below.

Battle Creek Transit Safety Performance Targets*

Mode of Transit Service	Fatalities (total)	Fatalities (per 10k VRM)	Injuries (total)	Injuries (per 10k VRM	Safety Events (total)	Safety Events (per 10kVRM)	System Reliability (VRM/failures)
Fixed Route Bus	0	0	3	.055	5	.091	15,000
ADA/ Paratransit	0	0	2	.036	4	.073	20,000

* Targets above are based on the previous 5 years of BCT's safety performance data.

National Highway System Bridge Condition Targets

The Transportation Performance Measure regulatory requirements outlined in 23 CFR 490.105 and 23 CFR 490.107 regarding bridge condition targets, are based on a state adjusted 4-year National Highway System targets. The Battle Creek Area Transportation Study recognizes the importance of a safe transportation system and supports the cooperatively developed bridge targets from the Michigan Department of Transportation. MDOT adopted adjusted 4-year bridge targets on October 1, 2020. BCATS adopted a resolution to support the state's adjusted bridge targets on January 27, 2021.

Michigan's Adjusted 4-Year Bridge Targets

Bridge Performance Measure	Baseline Condition Calendar Year 2017	2-Year Target (ended 10/1/20)	4-Year Target
% National Highway System Deck Area in Good Condition	32.7%	27.0%	23.0% (adjusted from the previous 4-yr. target of 26%)
% National Highway System Deck Area in Poor Condition	9.8%	7.0%	8.0% (adjusted from the previous 4-yr. target of 7%)

The current condition of NHS bridges in the BCATS area is shown in the table below.

BCATS MPO 2020 Bridge Conditions		
Deck Area in Good Condition	**Deck Area in Fair Condition**	**Deck Area in Poor Condition**
1% 3,429 square feet	92% 420,446 square feet	7% 31,722 square feet

The total NHS bridge deck area in the BCATS area is 455,597 square feet.

Pavement Condition Targets

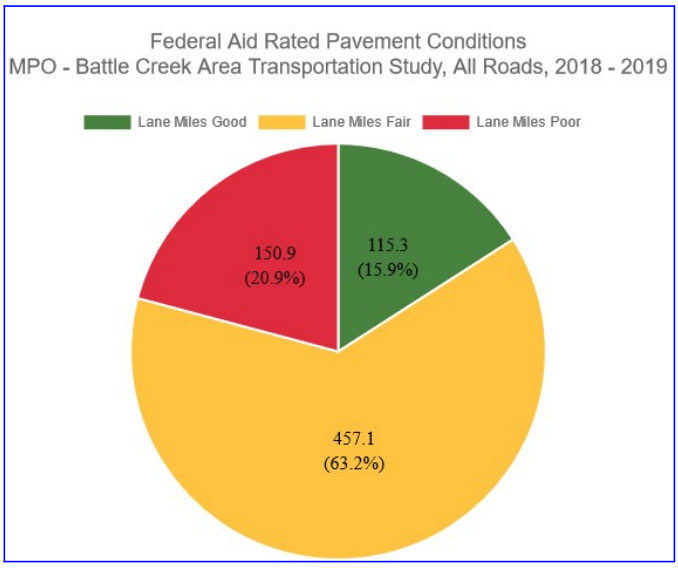
The federal regulations require the state to establish targets for pavement condition measures Percent Good and Percent Poor on the Interstate and non-Interstate National Highway System. Targets were to be set for two and four-year intervals for each measure, or eight targets total. However, for the Interstate measures, there were no two-year targets required for the first performance period of 2018 to 2021. Therefore, only six targets were set by the state in the first period. The regulations dictated the measuring tools to be used in defining the pavement condition. As with the other target categories, MPOs were to either support the state targets or establish their own independent targets for the required categories within 180 of the state establishing targets.

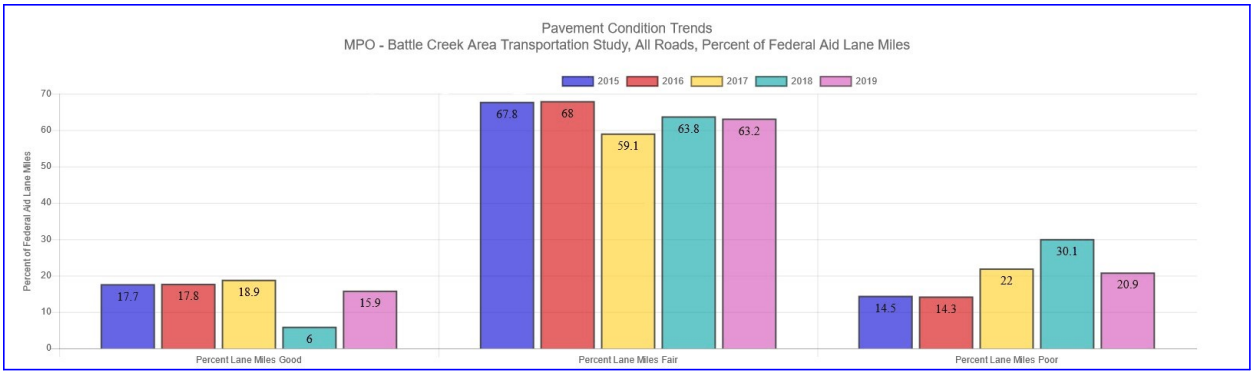
MDOT officially adopted the state pavement targets as of May 20, 2018. BCATS acted to support those targets on October 24, 2018. The table below indicates the Michigan State Pavement Targets.

Michigan State Pavement Targets

Pavement Performance Measure	Baseline Condition Calendar Year 2017	2-Year Targets	4-Year Targets
% Interstate Pavement in Good Condition	56.8%	N/A	47.8%
% Interstate Pavement in Poor Condition	5.2%	N/A	10.0%
% Non-Interstate NHS in Good Condition	49.7%	46.7%	43.7%
% Non-Interstate NHS in Poor Condition	18.6%	21.6%	24.6%

Pavement condition in the BCATS area has been measured for approximately 20 years using the PASER data collection process implemented by the Michigan Transportation Asset Management Council (TAMC). State of Michigan Act 51 (P.A. 499 202, P.A. 199 2007 requires each local road agency to annually report the mileage and condition of the road and bridge system within their jurisdiction and provide this data to the TAMC. The uniform PASER process for collection of condition data on federal-aid eligible roadways (which includes all Interstate and non-Interstate facilities) uses a visual inspection to evaluate pavement surface condition. It rates various types of pavement distress on a scale of 1-10, with 1 being the worst and 10 being the best. PASER helps to predict the remaining service life of a road and the type of maintenance needed to maximize pavement life. PASER data is to be collected in each Michigan county at 50% of the federal-aid eligible system each year. It so happens that the BCATS area includes approximately 50% of the federal-aid roadways in Calhoun County. Therefore, the PASER data collection process has been occurring every other year in the MPO area. The adjacent and following charts show the results of recent PASER data collection for the BCATS area.





System Performance – Travel Time Reliability

Travel Time Reliability relates to the consistency or dependability in travel time. It is measures from day to day, or across differing times of the day. Unreliable travel times usually occur during the "peak" periods of the day. Most travelers are less tolerant of "unexpected" delays since they cannot plan for it. The Travel Time Index (TTI) is the ratio of the congested travel time to the time it takes to make the same trip at free-flow speeds (light traffic conditions). When congestion gets worse, the TTI increases. Performance on the National Highway System (NHS) uses Level of Travel Time Reliability (LOTTR) to measure interstate and non-interstate travel. The interstate travel time reliability measure is the percent of "person-miles" traveled that are reliable. Non-interstate travel time reliability is measured by percent of "person-miles" traveled that are reliable. These measures correspond to 80th and 50th percentile travel times. Freight movement on the NHS is measured for reliability using the Truck Travel Time Reliability Index (TTTR) and corresponds to 95th and 50th percentile travel times. Travel time reliability in the BCATS area, as reported by MDOT with 2016, 2017, and 2018 data is shown in the tables below.

Level of Travel Time Reliability – Interstate "person-miles" for BCATS MPO			
2018	**2017**	**2016**	**Target**
99.7%	99.7%	98.5%	75%

Level of Travel Time Reliability – Non-Interstate "person-miles" for BCATS MPO		
2018	**2017**	**Target**
92.8%	96.1%	70%

Truck Travel Time Reliability Index for BCATS MPO			
2018	**2017**	**2016**	**Target**
1.23	1.15	1.25	1.75