

# PAVEMENT PERFORMANCE MANAGEMENT NEWSLETTER

## 2022-2025 PERFORMANCE PERIOD - BASELINE REPORT

Title 23 CFR §490 – National Performance Management Program (NPMP), Subpart C, directs MDOT and Michigan MPOs coordinate development of 2-year and 4-year predicted performance pavement targets within a defined four-year performance period in support of the national goals established by Congress in MAP-21 of 2012. In accordance with regulation and Federal Highway Administration (FHWA) guidance, targets are data-informed, analysis driven, realistic predictions of future performance constrained to projected program funding. These short-term predictions are intended to evaluate and support the most effective investment strategies for achieving long-term performance goals and expectations in State and MPO planning documents. The NPMP pavement measures are limited to the National Highway System (NHS), regardless of ownership, and the NHS represents a subset of the entire pavement network managed by MDOT, MPOs and local governments.

The four-year performance period baseline is actual pavement performance calculated from data collected the year prior to the first year of a performance period, and reported to the HPMS in the first year of the performance period. Pavement performance is calculated using the Pavement Condition Measure (PCM) which requires evaluation of pavement condition thresholds using International Roughness Index (IRI), Cracking Percent, Rutting (asphalt) and Faulting (jointed concrete) metrics (Figure 1), or Pavement Serviceability Rating (PSR) for segments where the posted speed limit is less than 40 miles per hour (mph).

Within each four-year performance period, FHWA will determine whether the State DOT has made significant progress toward respective State 2- and 4-year target achievement. Regulation defines significant progress as (1) actual performance is better than baseline or (2) actual performance is better than the respective target.

Pavement Condition Thresholds				
Metric	Surface Type	Metric Value Range		
		Good	Fair	Poor
International Roughness Index [IRI] (inches/mile)	Asphalt Pavement, Jointed Concrete Pavement, CRCP <sup>1</sup>	<95	95 - 170	>170
Cracking Percent (% of total area)	Asphalt Pavement	<5%	5 - 20%	>20%
	Jointed Concrete Pavement	<5%	5 - 15%	>15%
	CRCP <sup>1</sup>	<5%	5 - 10%	>10%
Rutting (inches)	Asphalt Pavement	<0.20	0.20 - 0.40	>0.40
Faulting (inches)	Jointed Concrete Pavement	<0.10	0.10 - 0.15	>0.15

Figure 1

### 2018-2021 “Phase-In” Comparison to 2022-2025

The 2018-2021 performance period was the first under the national program and several requirements of Title 23 CFR §490 were “phased-in.” For pavement performance, there are two fundamental changes that apply to the 2022-2025 performance period, and all future performance periods.

First, State DOTs and MPOs are required to develop two-year and four-year targets for Interstate good and poor measures, where the 2018-2021 period only required four-year targets. Second, the 2022-2025 Non-Interstate NHS baseline and targets will be calculated using the PCM or PSR compared to the 2018-2021 performance period that required targets based on IRI or PSR.

## Baseline Condition

In the first year of a new four-year performance period, a baseline for each pavement measure is calculated using prior year actual performance data and in accordance with Section 490, Subpart C.

NHS pavement data collected in 2021 and certified by FHWA in the 2021 HPMS Pavement Data Quality Summary (Figure 2, published 2022), serves as the performance period baseline condition for both Interstate and Non-Interstate NHS measures.

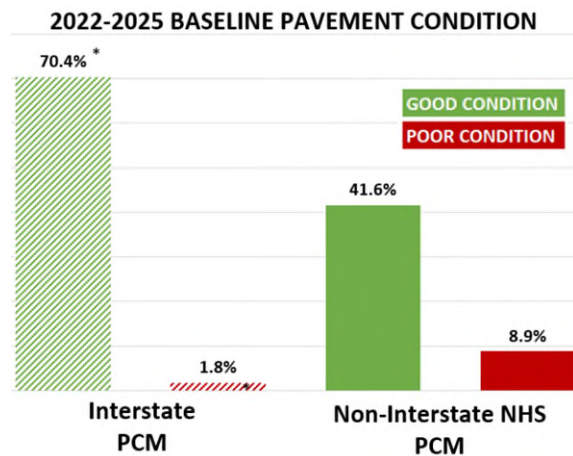


Figure 2 – Reflects condition reported by FHWA in the 2021 HPMS Pavement Data Quality Summary

In 2020, the Rebuilding Michigan Bond Program (RBMP) was announced. The RBMP focuses on rebuilding state highways and bridges critical to the state’s economy and that carry the most traffic. The bond financing is aimed at long-term asset performance. In 2021, the data collection vendor was not able capture 5.1 percent of the Interstate pavement segment due to construction-related traffic controls that prevented collection in compliance with 23 CFR 490.309.

Through regulation, FHWA established a 5.0 Missing, Invalid, or Unresolved (MIU) threshold. If a categorical dataset exceeds 5.0 MIU, FHWA considers the data set to be invalid for use in the national performance program. FHWA has unofficially signaled MDOT’s 2021 Interstate dataset at 5.1 MIU will be insufficient to determine significant progress for (1) the 2018-2021 Interstate performance and (2) the 2022-2025

performance period baseline - although regulation on the latter is more ambiguous.

This was something Michigan and peer State DOTs raised as a concern during the rule-making process. Michigan is encouraging FHWA evaluate the regulatory threshold impact and consider exceptions where the MIU is the direct verified result of program investment. FHWA will provide their formal written assessment by mid-year 2023.

## Target Setting Process

As directed by Section 490 and FHWA guidance, national predicted performance targets are to reflect data-informed, analysis driven, realistic predictions of future performance constrained to available program funding for the four-year performance period. FHWA strongly discourages establishing aspirational targets for this program.

It is also important to distinguish the difference between performance goals, such as those established by the State Transportation Commission (STC) for MDOT or by a board for an MPO, and the federally required predicted performance targets. For example, the STC pavement goals for MDOT are for State trunkline measured by Remaining Service Life (RSL), wherein the national predicted performance targets are for the NHS (State and local owned), measured by PCM. These are not equivalent or appropriate for comparison. The NHS represents a portion of the pavement system managed by MDOT and local governments.

For the **2022-2025 performance period**, the analysis and methods used by the TPM Pavement Team to develop the national predicted performance targets considered inputs and influences not limited to the following: historical trends (outcome of prior investments), current condition (baseline), improvements from investment strategies (5-year program/projects), anticipated natural deterioration based on life-cycle analysis (assets), anticipated changes in use (system performance), and other exogenous factors. Grant and other competitive funding opportunities being pursued but not officially

awarded at the time of analysis were not considered in the target setting process

As part of the current/forecasted condition analysis, the TPM pavement team examined the segments currently rated in fair condition and determined it necessary to further subdivided fair rated segments into three categories: “near good”, “fair”, and “near poor.” As shown in Figure 4, 7.8 percent of the network currently rated in “Fair” condition is nearing poor condition. The team then examined the 5-year investment program to determine the extent to which investments planned for the 4-year period would offset/manage the decline.

PCM Rating	Composite Metric		Interstate % of	
	Combinations	Breakdown	Lanemiles	Interstate
Fair	Poor, Fair, Fair	Near Poor	77	1.3%
	Poor, Fair, Good	Near Poor	393	6.5%
	Poor, Good, Good	Fair	299	4.9%
	Fair, Fair Fair,	Fair	21	0.3%
	Good, Fair, Fair	Fair	197	3.2%
	Good, Good, Fair	Near Good	704	11.6%

Figure 3 – Further analysis of “Fair” PCM rated Interstate segments

On a related matter, when FHWA published the final HPMS PDQS there were notable differences from the preliminary condition used for the MDOT- MPO pavement target-setting coordination session held in July 2022 as shown in Figure 4. While not uncommon for preliminary condition estimates and the final performance reported in the HPMS PDQS to have minor differences, this year the differences were more significant. Of interest in 2022, FHWA had to delay the biennial performance reporting process due to ongoing issues with their HPMS 9.0 system upgrade. This complicated the data verification and reconciliation process.

Performance Measure	Baseline Performance
<b>NHPP: NHS Pavement Condition (§490, Subpart C)</b>	
Pavement Condition Metric (PCM) is IRI, Cracking, and Rutting (asphalt)	
Percentage of Pavements of the Interstate in Good Condition (PCM)	70.4% <del>65.0%</del>
Percentage of Pavements of the Interstate (NHS) in Poor Condition (PCM)	1.8% <del>2.3%</del>
Percentage of Pavements of the Non-Interstate NHS in Good Condition (PCM)	41.6% <del>42.1%</del>
Percentage of Pavements of the Non-Interstate NHS in Poor Condition (PCM)	8.9% <del>6.2%</del>

Figure 4 – 2022-2025 baseline changes between MDOT-MPO coordination session and final HPMS PDQS.

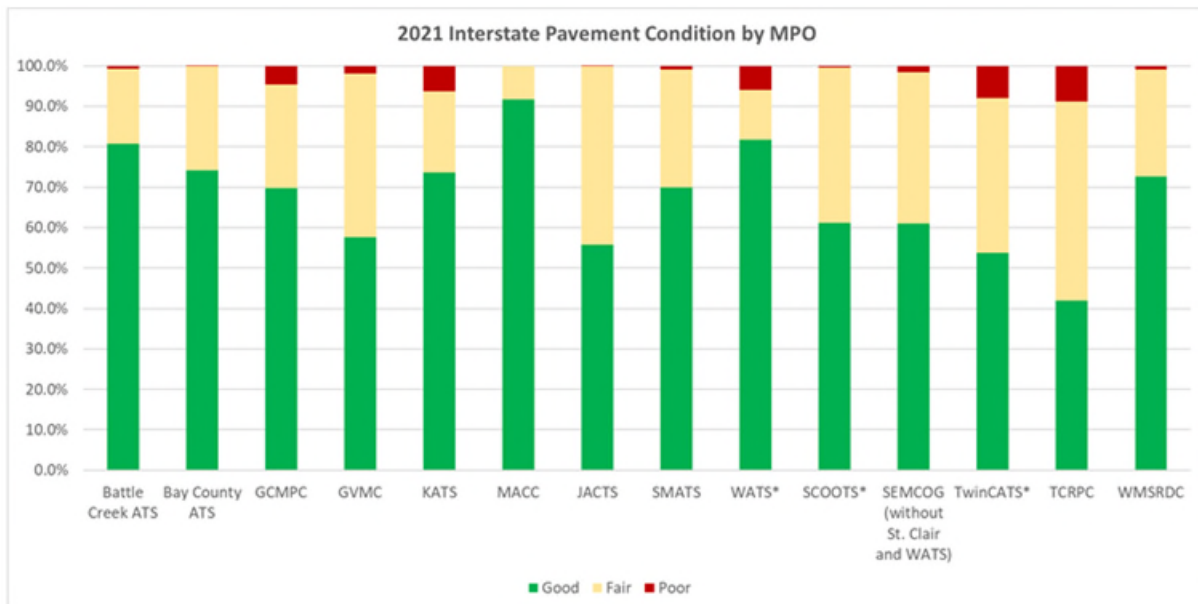
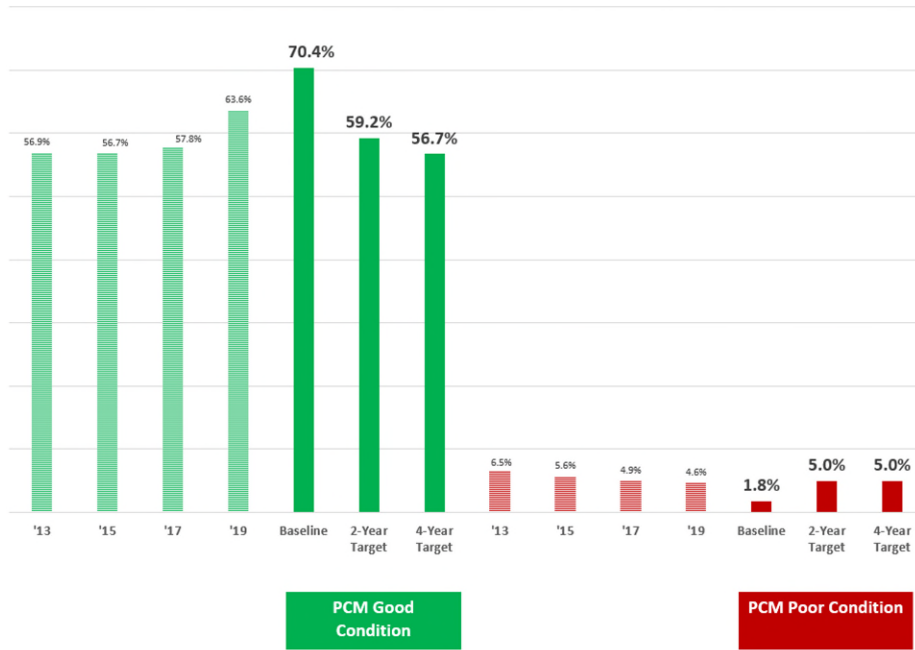
Considering the baseline changes, the TPM Pavement Team conservatively improved the State Interstate good condition 2-year target from 56.7 percent to 59.2 percent from the draft targets discussed by MDOT-MPOs at the target setting coordination meeting in July 2022. The 2.5-point improvement represents about half of the difference between the preliminary calculated baseline and the final 2021 HPMS PDQS reported by FHWA. This change was presented to MTPA in November 2022 with no noted concerns. The pavement team recommended no changes to the remaining pavement targets. Actual performance will be evaluated over the next two years and if supported by data, there will be an opportunity to discuss adjusting one or more 4-year State pavement targets within the mid-performance period report of 2024.

*By June 14, 2023 (180 days following establishment of State targets), MPOs are required to develop 2- year and 4-year targets for all four pavement measures. MPOs have two options for target development: (1) agree to plan and program projects that supports a State target(s) or (2) develop a quantifiable target(s) for the metropolitan planning area. MPOs target elections can be made on a per measure basis. For example, an MPO can elect to support the State 2-year target for Interstate Good and develop an MPO boundary 2-year target for Interstate Poor.*

*Also note, FHWA does not make a significant progress determination of MPO targets whether the MPO elects to support the State target or develop an MPO boundary target. Further, an MPO is not subject the consequence or penalty imposed upon the State DOT for not achieving State targets regardless of whether the MPO elected to support the State target or develop an MPO boundary target.*

## Interstate State Targets and MPO 2021 Performance

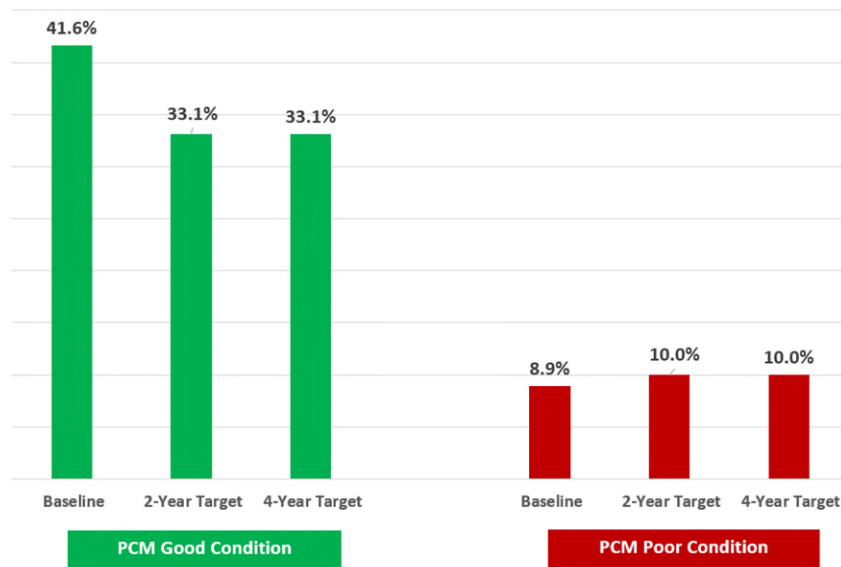
### 2022-2025 State Interstate Pavement Targets



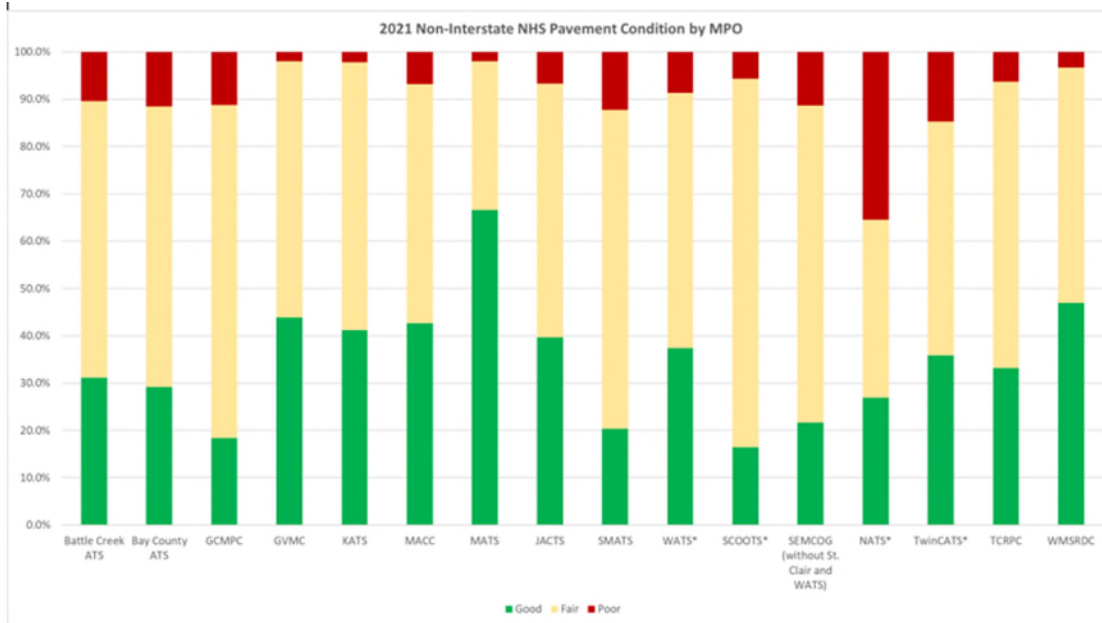
2021 Interstate Pavement Condition Measure by MPO				
MPO	Good	Fair	Poor	Interstate Thru Miles **
Battle Creek Area Transportation Study	80.7%	18.6%	0.7%	66.5
Bay County Area Transportation Study	74.1%	25.8%	0.1%	92.2
Genesee County Metropolitan Planning Commission	69.7%	25.6%	4.6%	390.4
Grand Valley Metropolitan Council	57.6%	40.6%	1.8%	253.6
Kalamazoo Area Transportation Study	73.6%	20.1%	6.4%	161.1
Macatawa Area Coordinating Council	91.7%	8.3%	0.0%	76.3
Region 2 Planning Commission	55.8%	44.1%	0.0%	124.3
Saginaw Metropolitan Area Transportation Study	69.9%	29.2%	0.9%	198.8
Southeast Michigan Council of Governments	63.0%	35.1%	1.9%	2,291.8
Washtenaw Area Transportation Study *	81.8%	12.3%	5.9%	211.1
St. Clair County Transportation Study *	61.2%	38.4%	0.3%	158.5
SEMCOG (without St. Clair and WATS)	61.1%	37.3%	1.6%	1,922.2
Southwest Michigan Planning Commission	53.8%	38.3%	7.9%	169.7
Twin Cities Area Transportation Study *	53.8%	38.3%	7.9%	169.7
Tri-County Regional Planning Commission	41.9%	49.3%	8.7%	432.4
West Michigan Shoreline Regional Development Commission	72.7%	26.5%	0.8%	48.4

### Non-Interstate NHS State Targets and MPO 2021 Performance

2022-2025 State Non-Interstate NHS Pavement Targets



The 2022-2025 performance period introduces PCM as the Non-Interstate NHS pavement measure for the national program.

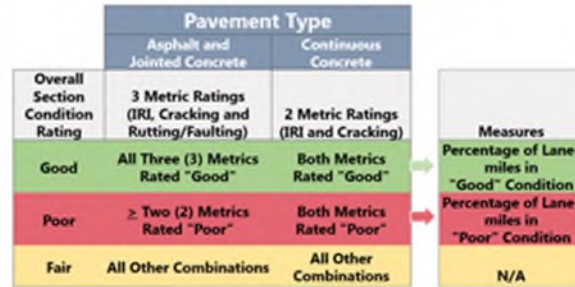


2021 Non-Interstate NHS Pavement Condition by MPO				
MPO	Good	Fair	Poor	Non-Interstate Thru Miles **
Battle Creek Area Transportation Study	31.1%	58.5%	10.4%	101.7
Bay County Area Transportation Study	29.1%	59.3%	11.6%	147.7
Genesee County Metropolitan Planning Commission	18.4%	70.4%	11.2%	488.0
Grand Valley Metropolitan Council	43.9%	54.2%	2.0%	831.0
Kalamazoo Area Transportation Study	41.2%	56.6%	2.2%	308.0
Macatawa Area Coordinating Council	42.7%	50.5%	6.8%	134.9
Midland Area Transportation Study	66.6%	31.4%	2.0%	296.4
Region 2 Planning Commission	39.6%	53.7%	6.7%	199.3
Saginaw Metropolitan Area Transportation Study	20.3%	67.4%	12.3%	280.9
Southeast Michigan Council of Governments	22.7%	66.2%	11.1%	5,825.9
Washtenaw Area Transportation Study *	37.4%	53.9%	8.7%	428.7
St. Clair County Transportation Study *	16.4%	77.8%	5.7%	83.3
SEMCOG (without St. Clair and WATS)	21.6%	67.0%	11.4%	5,313.9
Southwest Michigan Planning Commission	32.3%	44.7%	23.0%	235.1
Niles-Buchanan-Cass Area Transportation Study	26.9%	37.6%	35.5%	94.4
Twin Cities Area Transportation Study *	35.9%	49.4%	14.7%	140.7
Tri-County Regional Planning Commission	33.2%	60.5%	6.3%	554.8
West Michigan Shoreline Regional Development Commission	47.0%	49.7%	3.4%	356.4

### Pavement Condition Thresholds

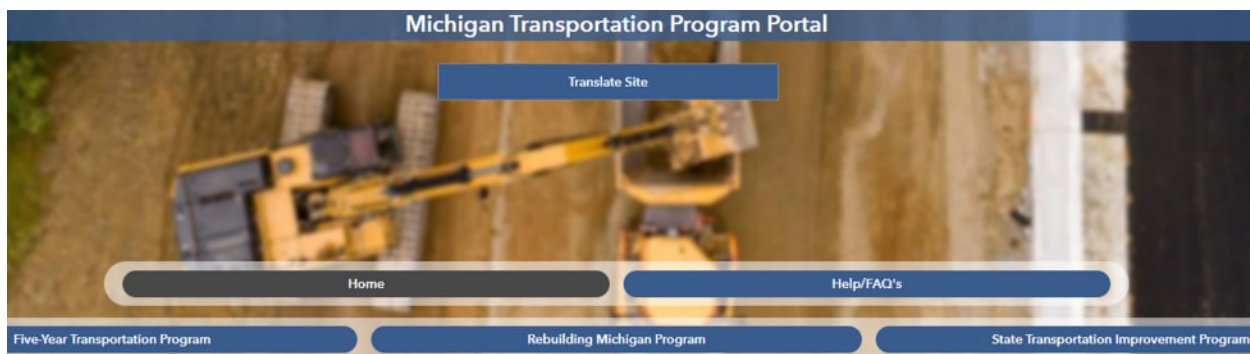
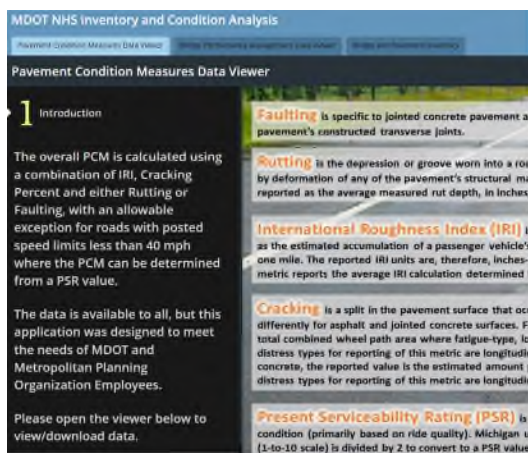
	Good	Fair	Poor
IRI (inches/mile)	<95	95-170	>170
Rutting (inches)	<0.20	0.20-0.40	>0.40
Faulting (inches)	<0.10	0.10-0.15	>0.15
Cracking (%)	<5	5-20 (asphalt) 5-15 (JCP) 5-10 (CRCP)	>20 (asphalt) >15 (JCP) >10 (CRCP)

### Calculation of Pavement Condition Measures for Interstate



### Available Data

The [MDOT NHS Inventory and Condition Analysis](#) data viewer is available online, which provides pavement condition and inventory information for Interstate PCM and non-Interstate IRI data, and information on bridges as well. In addition, MDOT developed the [Michigan Transportation Program Portal](#) providing links and maps to the 5-Year Transportation Plan, State Transportation Improvement Program, and the Rebuilding Michigan Program.



### For More Information

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