

TRANSPORTATION PERFORMANCE MANAGEMENT

PAVEMENT PERFORMANCE MANAGEMENT

PAVEMENT PERFORMANCE REQUIREMENTS

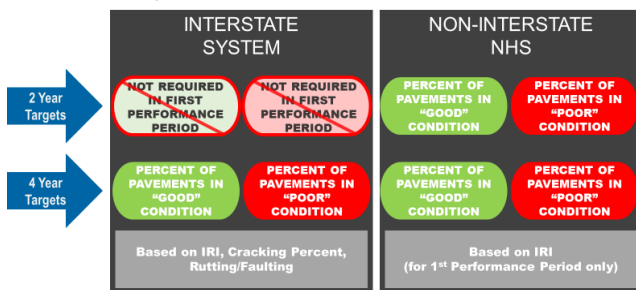
The Federal Highway Administration (FHWA) published in the Federal Register (82 FR 5886) a final rule establishing performance measures for State Departments of Transportations (DOTs) to use in managing pavement and bridge performance on the National Highway System (NHS). The National Performance Management Measures; Assessing Pavement Condition and Bridge Condition for the National Highway Performance Program Final Rule addresses requirements established by the Moving Ahead for Progress in the 21st Century Act (MAP-21) and reflects passage of the Fixing America’s Surface Transportation (FAST) Act. The rule became effective May 20, 2017.

The federal rule requires MDOT to establish targets for pavement condition measures Percent Good and Percent Poor on the Interstate and non-Interstate NHS. Targets are required for two and four-year intervals for each measure, with eight targets in total. For the Interstate measures, there will be no two-year targets for the first (2018-2021) performance period per 23 CFR Part 490, therefore, there will only be six targets in the first period.

considered in poor condition. Only IRI will be used to determine non-interstate condition for the 2018-2024 performance period, after which it will use PCM. Cracking Percent and IRI are to be reported on all pavement types. Rutting is to be reported only on asphalt pavements, and faulting, on jointed concrete pavements. The table below indicates the metric thresholds for condition on each pavement type, as defined by the rule.

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

REQUIREMENTS



The rule requires states to measure, monitor and set targets based upon a composite index of pavement condition measures (PCM). The four metrics to be used are International Roughness Index (IRI), Cracking Percent, and Rutting/Faulting as reported by states to the FHWA’s Highway Performance Monitoring System (HPMS). All four metrics will be used to determine the condition for Interstate. If all three metrics on a segment are “good,” then a pavement is rated in good condition. If two or more metrics are “poor,” it is to be

TARGET SETTING AND SIGNIFICANT PROGRESS

• **Targets:** The Transportation Performance Management (TPM) Pavement Rule designates recurring four-year performance periods for which MDOT is required to establish two-year (midpoint) and four-year (full performance) targets for pavement condition on the National Highway System (NHS).

• **Performance Measures:** There are four performance measures for assessing pavement condition based on composite analysis of the metrics above:

- 1) percent of Interstate pavement in Good Condition
- 2) percent of Interstate pavement in Poor Condition
- 3) percent of Non-Interstate NHS pavement in Good Condition
- 4) percent of Non-Interstate NHS pavement in Poor Condition. States were required to establish targets for each measure by May 20, 2018.

• **MPO Targets:** MPOs are required to establish four-year targets for these measures and have two options

for target selection: agree to plan and program projects that support MDOT targets or commit to their own targets for their Metropolitan Planning Area (MPA).

- **MPO Targets Due:** MPO targets are due on November 16, 2018, 180 days after MDOT’s targets. These targets are not reported to FHWA but must be reported to MDOT in a manner both parties agree to. MPOs will include targets in their TIPs and LRP and explain how their projects and programs support either MDOT’s or the MPO’s targets.

- **Significant Progress (State Targets):** FHWA will determine significant progress on the Mid- and Full Performance Period Progress Reports. Significant progress is defined as achieving a condition that is equal to or better than the target, or better than the baseline condition. If significant progress is not achieved, MDOT must document how it plans to achieve it for the next report

ROAD OWNERSHIP

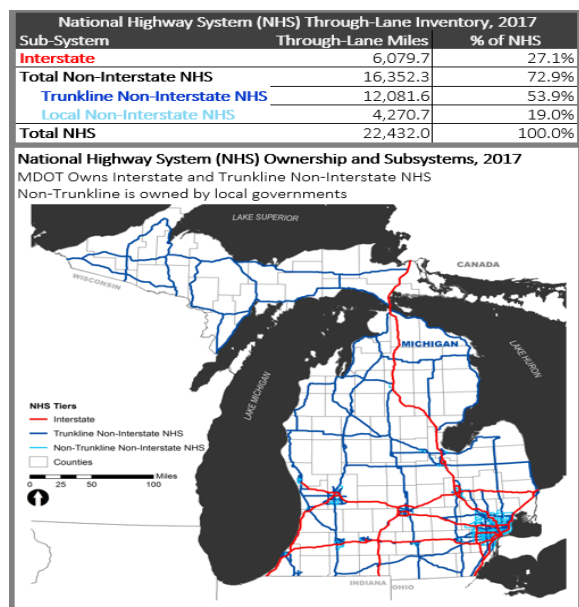
The rule applies to the entire National Highway System (NHS), which includes the Interstate, and Non-Interstate NHS. The Non-Interstate portion of the system is comprised of trunkline (MDOT owned) and non-trunkline (local government owned) roads. Local agencies own 19 percent of the NHS in Michigan, while MDOT maintains ownership of approximately 81 percent (see table below). MDOT and MPO targets must cover the entire NHS, regardless of ownership, meaning these agencies may have a limited influence

to achieve these targets. To account for this, the rule requires MDOT and MPOs to coordinate target setting, planning, and programming, ensuring targets are feasible, and projects are geared toward achieving them.

MDOT Investment Strategy Process

Department goals for state trunkline pavement condition are established by the State Transportation Commission (STC) and influence the way MDOT invests in and maintains state-owned transportation infrastructure. To do this, MDOT conducts investment planning. Investment strategies guide the allocation of capital resources to achieve the goals established. Investments are focused where they will most benefit the public, consistent with the direction established.

Investment strategies are developed utilizing anticipated available funding, life cycle planning, performance gap analysis, and the results of risk analysis. The various strategies are also analyzed and compared to determine how they would impact the overall goals and objectives set by the STC. The desired mix of fixes, investment levels, and funding targets are developed for the selected investment strategy and provided in the Highway Call for Projects memo. They form the basis for project selection and prioritization. The selected investment strategy is communicated to the public by way of the annual Five-Year Transportation Program. MDOT’s investment strategy to achieve the constrained Michigan targets for asset condition are reflected in the current STIP program of projects.



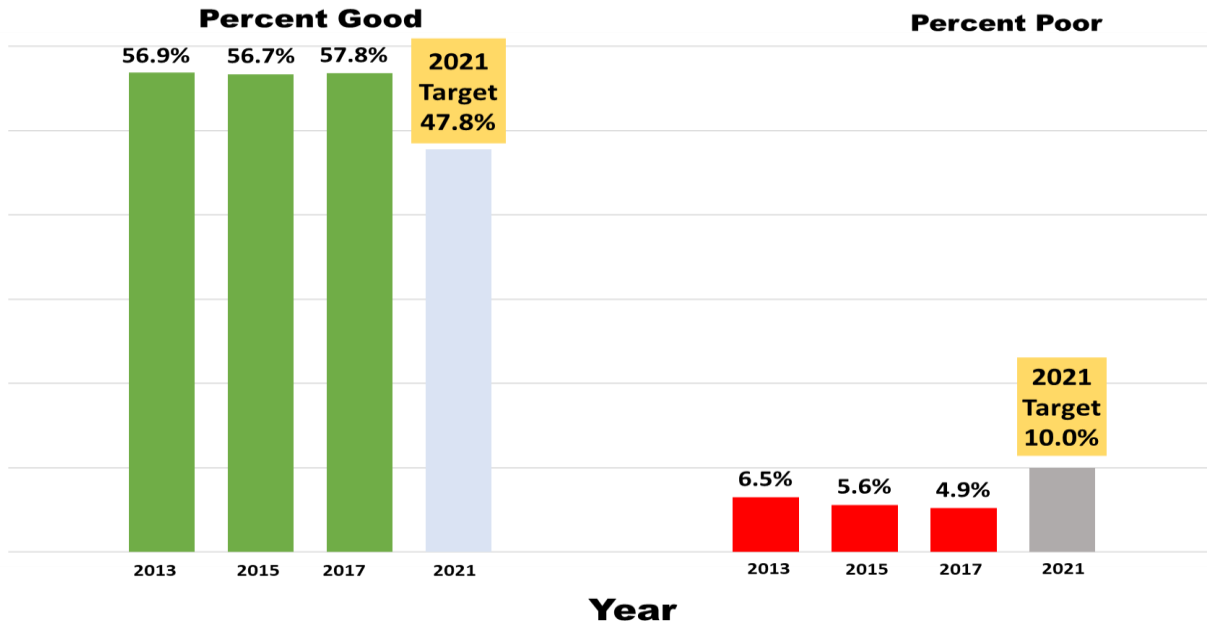
2018-2021 STATEWIDE PAVEMENT TARGETS

In 2018, the TPM Pavement Team reviewed historical trends of condition metric data from the last decade (2007-2017) to support future target establishment. FHWA and MDOT use the Highway Performance Monitoring System (HPMS) to report pavement condition. According to the rule, HPMS data must be submitted annually by April 15 for Interstate data, and June 15 for Non-Interstate NHS data. These figures were used as a baseline to establish the statewide targets. With MDOT’s current funding levels, trunkline pavement condition is anticipated to decline over the course of the next decade, and therefore, MDOT has chosen conservative targets to reflect this decline.

Given the definition of significant progress (equal to or better than the target, or better than the baseline condition), MDOT can achieve significant progress while targets are declining if condition does not fall below the targets.

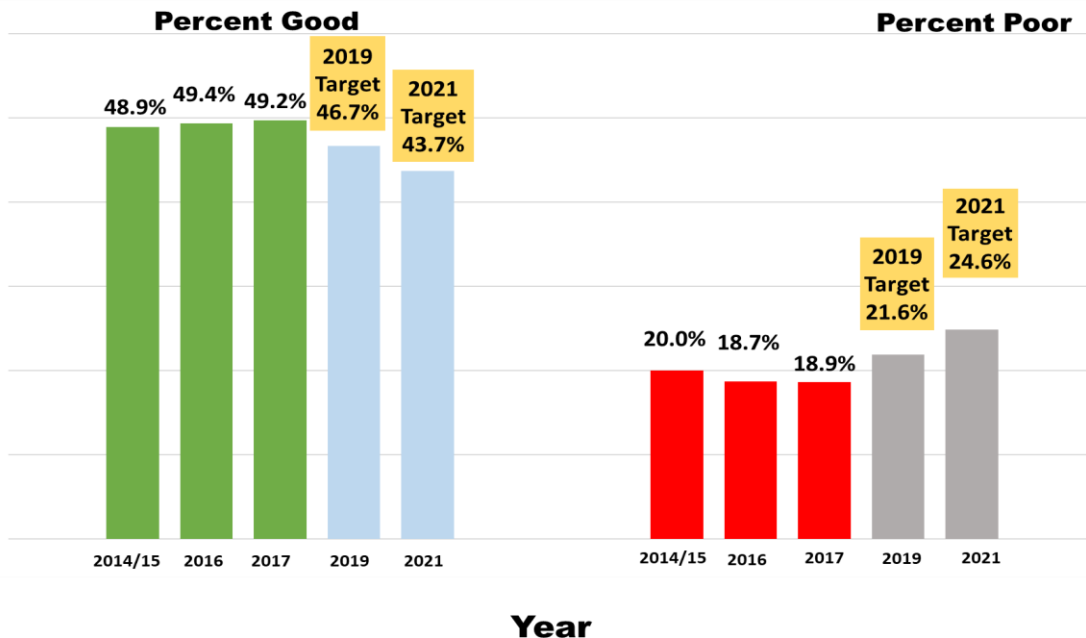
Interstate Targets

Percent Good/Poor Interstate PCM 2014-2017



Non-Interstate Targets

Percent Good/Poor Non-Interstate NHS IRI 2013-2017



Conservative Targets

The conservative nature of the approved targets is based on several factors:

- 1) Forecasts of the trunkline pavement condition based on Remaining Service Life (RSL) is declining.
- 2) Sample size for the cracking measure will move from 30% to 100% of roads sampled.
- 3) Issues surrounding the data such as the use of new vendors and the introduction of more advanced data collection may make data collection inconsistent.
- 4) A buildup in the Interstate IRI category at the edge of good gives the potential for a significant number of segments to fall into fair.
- 5) The use of a composite score means that all three measures must be good to be counted as good. If only one measure was to fall the whole segment is no longer considered good.
- 6) At the current time, the sample size available for previous years is relatively small for the use of trend analysis.

Other major potential hindrances include climate changes, funding uncertainties, and funding levels.

REPORTING

Performance reporting is structured on a 4-year reporting cycle. Between October 2018 and October 2022, state DOTs will be required to submit three performance reports to FHWA for the first performance period. The same reporting structure will continue for each subsequent performance period.

Baseline Performance Report: In this report, MDOT must establish 2-year and 4-year targets, describe baseline conditions, urbanized area boundaries and population data, NHS limits, and relationships with other performance expectations. The Baseline Performance Report will include HPMS data collected in 2016 and 2017. States will be able to adjust the 4-year targets in the Mid-Performance Progress Report based on data collected in 2018 and 2019. To allow for the phasing in of new reporting requirements for Interstate pavement conditions, states are only required to establish 4-year targets for Interstate pavements in the **Baseline Performance Report due October 1, 2018**. Both 2-year and 4-year targets are required for non-Interstate NHS pavements.

Mid-Performance Progress Report: MDOT must report on 2-year conditions and performance, investment strategy effectiveness and discuss progress in achieving targets. States have the option to adjust 4-year targets at this time. In this report states may include a discussion of extenuating circumstances. Because states are not required to establish 2-year targets for Interstate pavements in the first performance period Baseline Performance Report, they would use the Mid-Performance Progress Report to establish the baseline condition/performance and, if necessary, adjust the 4-year targets. **Mid-Performance Period Progress Report due 10/1/20**.

Full Performance Progress Report: This report includes similar content as the Mid Performance Period Progress Report focusing on 4-year target achievement/significant progress. MPOs will report to MDOT their established targets, performance, progress, and achievement of the targets in a manner that is agreed upon by both parties and documented in the Metropolitan Planning Agreement. MDOT must provide the MPO report to FHWA, if requested. **Full Performance Period Progress Report due 10/1/20**.

Consequence and Penalty

Target Achievement - Consequence: FHWA will biennially assess whether Michigan has achieved or made significant progress toward pavement targets following the submittal of each mid-performance and full performance report. This timeline allows MDOT to provide extenuating circumstances in advance, as defined by regulation, for FHWA consideration in their assessment. Significant progress is defined by FHWA as (1) actual condition/performance level is better than the baseline condition/performance or (2) the actual condition/performance level is equal to or better than the established target. If it is determined Michigan did not make significant progress toward one or more targets in the respective biennial period, MDOT has six months from the determination date to amend the Biennial Performance Report (Mid- or Full, respectively) to document the actions that Michigan will take to achieve progress for each target FHWA determined was not achieved for that period. During the first performance period only, there will be no mid-performance period assessment for Interstate measures. There is no financial penalty for not achieving significant progress.

National Goal - Penalty: By September 30, 2019 and annually thereafter, FHWA will determine the percentage of Interstate lane-miles in “Poor” condition for the current year using the pavement condition thresholds described in the pavement performance requirements section of this document. If the Interstate pavement “Poor” condition exceeds five percent, MDOT must obligate the following and the penalty will remain in effect until the Interstate pavement “Poor” condition is equal to or less than five percent:

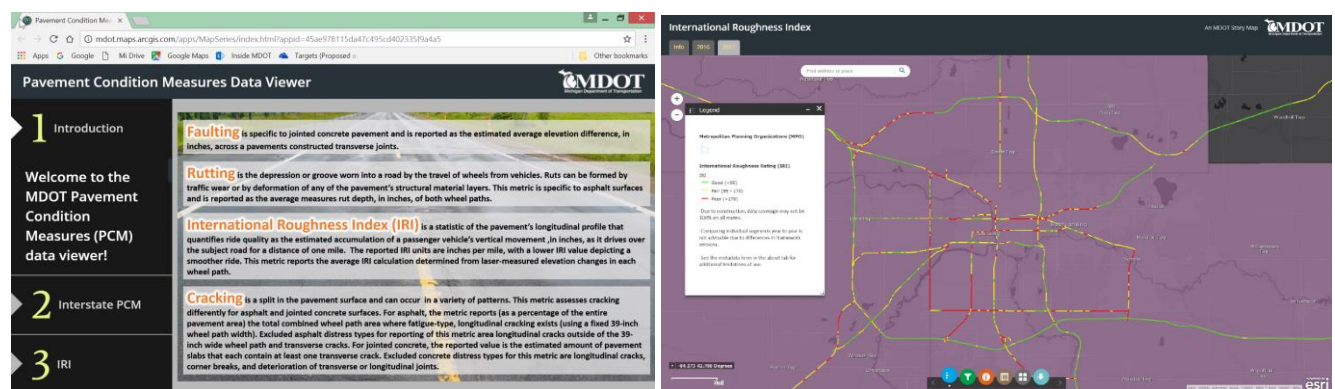
- From the amount apportioned to the State for the NHPP, an amount that is not less than the interstate Maintenance apportionment for fiscal year 2009 plus 2 percent per year compounded annually for the five additional fiscal years after 2013.
- For apportioned transfer Surface Transportation Program funds, an amount equal to 10 percent of Interstate Maintenance apportionment for fiscal year 2009.

These funds would need to be used to improve Interstate pavement conditions (as provided under the pre-MAP-21 Interstate Maintenance Program). There is no penalty assessment for the Non-Interstate pavement system.

Available Data

A web application is available online showing pavement conditions and inventory for Interstate PCM and Non-Interstate IRI data. This tool is available for use by the MPOs. The link to the application is below.

<http://mdot.maps.arcgis.com/apps/MapSeries/index.html?appid=35d2f76862e74c5a89319a9d5a55e5bd>



For More Information

Pavement condition data: Dan Sokolnicki

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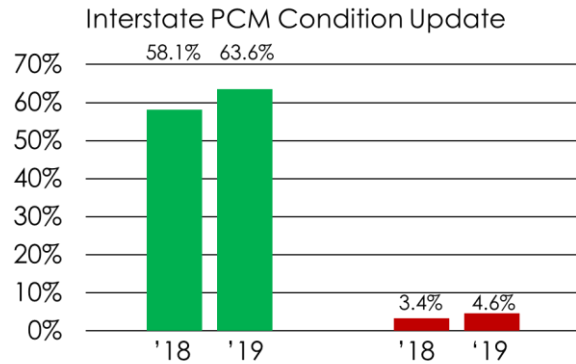
Pavement condition information: Michele Fedorowicz

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NATIONAL GOAL



FHWA annually assesses the percent of Interstate pavement in poor condition to ensure compliance with a minimum condition level requirement that no more than five percent of the Interstate System be in poor condition. Per the Interstate Pavement Condition Measure data submitted to HPMS for the years 2018 and 2019, Michigan achieved the National Interstate Pavement Condition Goal, as no more than 5 percent of NHS pavements were in poor condition.

As a result, the federal pavement penalty for not achieving the national goal will not apply to MDOT. MDOT acknowledges the risk posed by the interstate penalty and will continue to monitor both its interstate PCM condition and its interstate funding levels through strategic direction.

MID-PERFORMANCE PERIOD REPORT

The final pavement performance rule requires MDOT to report how previously established pavement targets compare to the actual measured condition of the NHS network. As interstate pavements did not require 2-year performance targets, this comparison will only be made against the 2-year non-interstate IRI targets. The state is also required to re-evaluate

their 4-year targets based on the newly collected pavement data and adjust them if necessary.

Significant Progress

Non-Interstate NHS IRI Target Progress				
Measure	Target	Outcome	Baseline	Significant Progress?
% Good	46.7%	48.5%	49.7%	Yes
% Poor	21.6%	19.1%	18.6%	Yes

As the non-interstate IRI data collected in 2019 indicates, the percentage of pavements in good condition is higher than the initially established 2-year target, and the percentage of poor pavements is lower than the respective 2-year target. The state has made significant progress toward the 2-year targets.

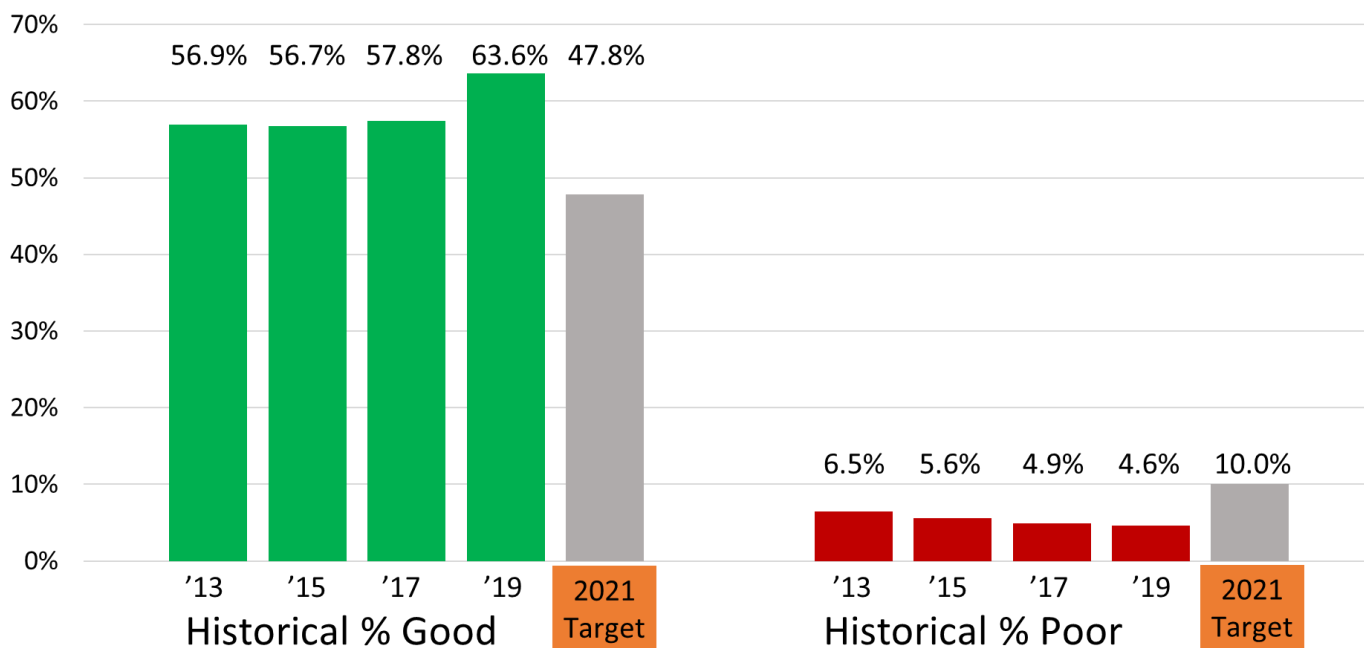
Target Re-evaluation

The TPM Pavement Team reviewed the previously established targets against the new pavement performance data gathered in 2018 and 2019. The data showed improvement in interstate PCM, and a relatively flat trend in non-interstate IRI. It is worth noting using Remaining Service Life as a tool for predicting pavement condition continues to demonstrate declining pavement condition.

The team decided that, despite the additional funding risks presented by the COVID crisis, the targets remained reasonably conservative. It is anticipated significant progress can be made towards these targets, as they account for the possible impacts of risks such as continuing low funding levels, funding uncertainty, as well as concerns about future consistency of data received while switching to a new vendor contract.

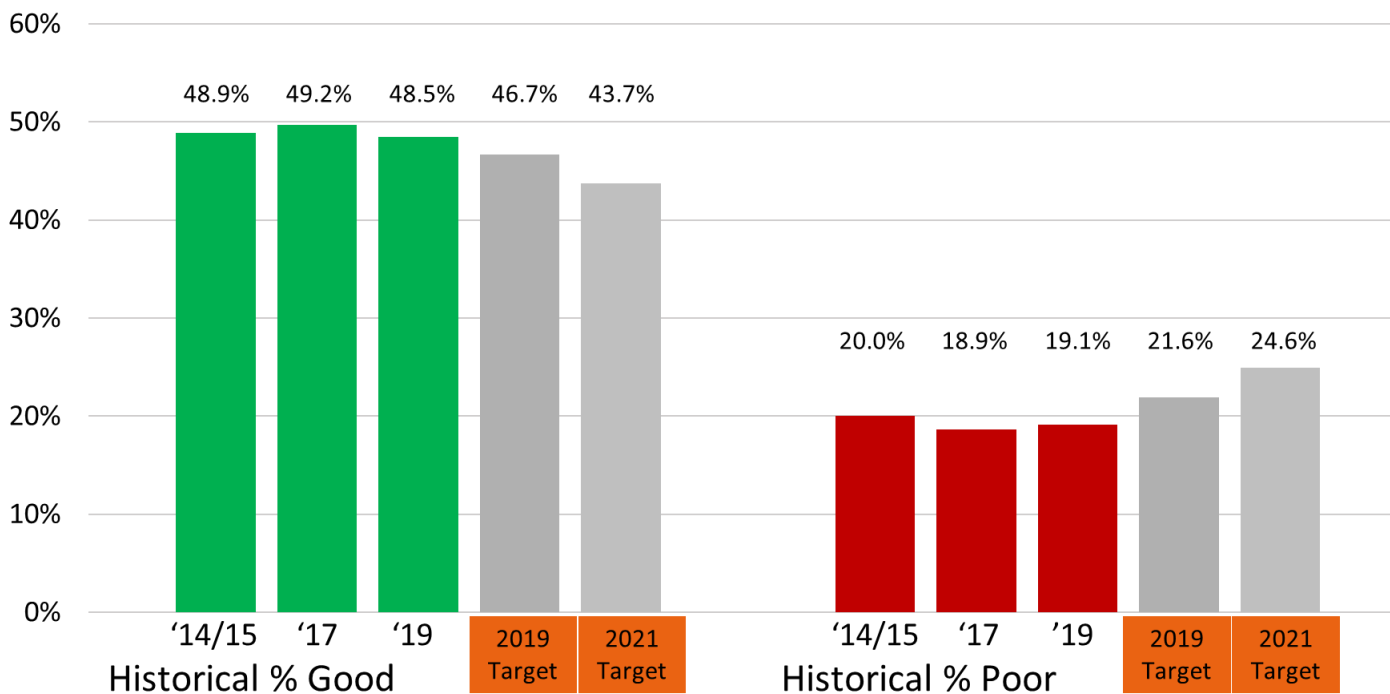
INTERSTATE TARGETS

Percent Good/Poor Interstate PCM 2013-2019



NON-INTERSTATE NHS TARGETS

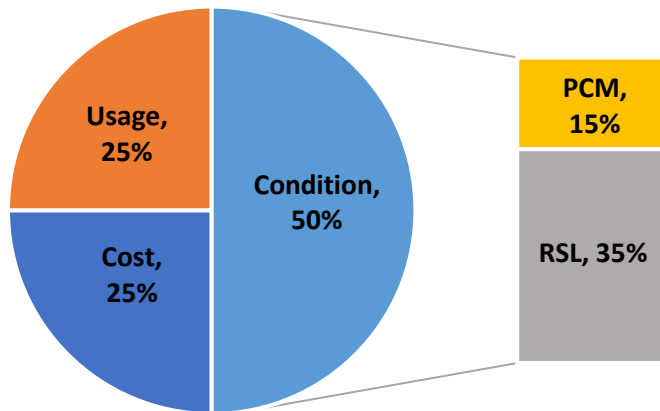
Percent Good/Poor Non-Interstate NHS IRI 2014-2019



IMPLEMENTING THE FEDERAL PCM MEASURE

MDOT has successfully begun to implement the federal performance measure (PCM) into its planning and programming processes. From data collection, analysis, and decision making, the use of the PCM measure is expanding.

MDOT Regional Funding Allocation Formula



MDOT Regional Funding Allocation

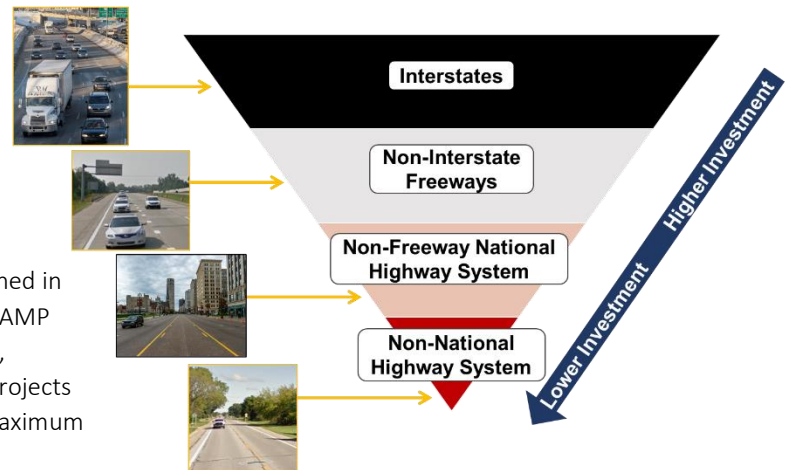
Since the establishment of the targets, MDOT has included the federal measure in its regional funding allocation formula for road reconstruction and rehabilitation. This formula designates funds to areas of the state based, in part, upon condition measures like PCM.

This funding is then distributed to regional offices that draft projects for approval through the Call for Projects Process. The regional offices are encouraged to consider PCM condition when selecting projects but are not required to.

MDOT Strategic Direction

MDOT has also implemented investment strategies that support the achievement of the national goal as well as the maintenance of the NHS network. MDOT actively directs its project selection practices prioritizing the interstate and overall NHS systems.

The strategic direction process takes the funds established in the regional funding allocation and allots them to the TAMP tiers as indicated in the image to the right. In particular, strategic direction suggests allocation to the selected projects meet a minimum funding amounts on freeways, and maximum funding amounts on non-freeway systems.



Future Implementation

MDOT continues to develop new ways to implement the federal PCM into the project selection processes. Areas of possible development include using the metrics as criteria for project selection, development of the Project Identification Tool which would incorporate the measure, and development of a forecasting system that would support target setting.

For More Information

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