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# 2015 PAVEMENT CONDITION ANNUAL REPORT

December 2015



Office of Materials and  
Road Research  
Pavement  
Management Unit

We all have a stake in **A**  **B**





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## **INTRODUCTION**

This report is prepared annually by the Minnesota Department of Transportation (MnDOT) Pavement Management Unit to provide information concerning trunk highway pavement performance. It discusses statewide performance trends compared with established targets and compares performance between the eight Area Transportation Partnerships (ATP).

## **BACKGROUND**

MnDOT's trunk highway system consists of approximately 12,000 centerline miles of pavement. This system consists of bituminous, concrete, and composite pavement with a wide range of conditions, ages, and performances. Each year, the Pavement Management Unit collects pavement roughness and digital image data on the entire trunk highway system, in both directions, and calculates surface distress quantities on approximately 60% of the system. Condition data has been collected on the trunk highway network since the late 1960s.

## **DATA COLLECTION**

The pavement roughness and surface distress data are collected using a sophisticated digital inspection vehicle (shown below). The van is driven over every mile of trunk highway annually, in both directions. This van is equipped with two cameras to collect images for the Video Log. For pavement distress and rutting measurements, a scanning laser, and a 3D laser/camera system are used to provide images of the pavement surface, from which the type, severity, and amount of cracking can be determined. The van is also equipped with laser height sensors that measure the longitudinal pavement profile, from which pavement roughness is calculated.



Pavement condition data is used to monitor the performance of the system, to aid in project selection, and to identify future pavement maintenance or rehabilitation.

## **INDICES AND MEASURES**

MnDOT's pavement condition data is reduced to several indices for reporting the statewide pavement performance measures in MnDOT's 20-year Transportation Plan: Ride Quality Index (RQI), Surface Rating (SR), Pavement Quality Index (PQI), and Remaining Service Life (RSL). Each index captures a different aspect of the pavement's health and can be used to rank pavement sections and predict the need for future maintenance and rehabilitation. They are each briefly described below.

***RQI: Ride Quality Index***

The RQI is MnDOT's ride, or smoothness, index. It uses a zero to five rating scale, rounded to the nearest tenth. The higher the RQI, the smoother the road is. The RQI is intended to represent the rating that a typical road user would give to the pavement's smoothness as felt while driving his/her vehicle. Most new construction projects have an initial RQI above 4.0. Pavements are normally designed for a terminal RQI value of 2.5. When a road has reached its terminal RQI value it does not mean the road cannot be driven on, but rather that it has deteriorated to the point where most people feel it is uncomfortable and a major rehabilitation is likely needed.

The RQI is calculated from the pavement's longitudinal profile, measured by the front mounted lasers on the digital inspection vehicle. A mathematical simulation, called the International Roughness Index (IRI), is then run to estimate the amount of vertical movement a standard vehicle would experience if driven down the road. The IRI is the roughness index used by every state DOT in the U.S. as well as most countries in the world. In the past, MnDOT has taken a rating panel of 30 to 40 people into the field and driven them over hundreds of test sections to get their perception of the smoothness of various pavement sections. Following right behind them was the digital inspection vehicle. This provides us with a direct correlation between the IRI, as measured by the van, and the perceived roughness, as felt by the rating panel.

***SR: Surface Rating***

Pavement distresses are those defects visible on the pavement surface. They are symptoms, indicating some problem or phenomenon of pavement deterioration such as cracks, patches and ruts. The type and severity of distress a pavement has can provide great insight into what its future maintenance and/or rehabilitation needs will be.

MnDOT uses the SR to quantify pavement distress. The distress identification procedure used to determine the SR is done by technicians using computer workstations in the Pavement Management Unit of the Office of Materials and Road Research, located in Maplewood, MN. The workstations allow the technicians to view and analyze the digital images captured by the van. The van captures several images that are shown on monitors simultaneously. The front, side, and down views help the technicians determine the type, severity, and amount of each defect.

Because of the time involved determining the SR, MnDOT does not conduct continuous distress surveys. Instead, the first 500 feet of each mile and section are rated ( $\approx 10\%$  sample). On undivided roadways, only the outside lane in the increasing direction (north or east) is rated when the SR is measured. On divided routes, the outside lane in both directions is rated.

The percentage of each distress in the 500-foot sample is determined and multiplied by a weighting factor to get a weighted distress value. The weighting factors are greater for higher severity levels of the same distress and greater for distress types that indicate more serious problems exist in the roadway such as alligator cracking or broken panels. The weighted distresses are then combined to determine the SR. The SR ranges from 0.0 to 4.0, and is reported to the nearest tenth. A higher SR means better condition. A road with no defects is rated at 4.0. A road in need of major rehabilitation or reconstruction will generally have an SR near or below 2.5.

***PQI: Pavement Quality Index***

The PQI is a composite index, equal to the square root of the product of RQI and SR. As such, it gives an overall indication of the condition of the pavement, taking into account both the

pavement smoothness and cracking. The PQI is the index used to determine if the state highway system is meeting performance thresholds established for the Government Accounting Standards Board, Standard 34 (GASB 34).

**RSL: Remaining Service Life**

The RSL is an estimate, in years, until the RQI will reach a value of 2.5, which is generally considered the end of a pavement’s design life. Most pavements will need some type of major rehabilitation when the RQI has reached this value. The RSL is determined from pavement deterioration curves. A regression curve is fit through the historical RQI data for each pavement section and the year the RQI will reach 2.5 is estimated. If there is insufficient historical data to make this calculation, default models, based on statewide pavement performance, are used. Rehabilitation activities with long service lives will add a considerable number of years to the RSL of a pavement. Short-term fixes, such as patching, may increase the pavement smoothness for a short time, but do not result in many additional years of RSL.

Each year, the RSL is calculated for all highway segments. From these values, a length-weighted Average Remaining Service Life (ARSL) is calculated for the entire trunk highway system as well as for each ATP. Service life is added when some type of maintenance or rehabilitation is done on a pavement section. Service life is lost when the condition of a pavement section deteriorates due to aging. The ARSL of the highway system increases if the projects being done add more life to the system than the sum of the deterioration of all the other sections.

**PERFORMANCE CATEGORIES**

MnDOT currently categorizes pavement condition, as measured by the RQI, into five equal categories as shown in Table 1. When reporting performance measures, the top two and bottom two categories are combined and referred to as “Good” and “Poor,” respectively. These terms will be used for the remainder of this report.

**Table 1. Ride Quality Index (RQI) Performance Categories**

Descriptive Category	RQI Range	Performance Measure Category
Very Good	5.0 – 4.1	Good
Good	4.0 – 3.1	
Fair	3.0 – 2.1	Poor
Poor	2.0 – 1.1	
Very Poor	1.0 – 0.0	

**PERFORMANCE TARGETS**

The federal authorization bill Moving Ahead for Progress in the 21<sup>st</sup> Century Act (MAP-21), was signed into law July 6, 2012. MAP-21 places added emphasis on the performance of the National Highway System (NHS). To comply with MAP-21, pavement conditions will be tracked by the following categories: Interstate, Other-NHS, and Non-NHS.

Minnesota’s trunk highway system mileage is comprised of roughly 13% Interstate, 40% Other-NHS, and 47% Non-NHS. ATP-2 and ATP-8 do not have any roads on the Interstate system.

Performance targets for the Interstate system will be established by the FHWA and published at a later date. Until such time, MnDOT is using a target for the Interstate system of 70%, or more, in “Good” condition and 2%, or less, in “Poor” condition. Each state is to set targets for the Other-NHS. For 2013, the performance targets on the Other-NHS are 65%, or more, in “Good” condition and 4%, or less, in “Poor” condition, as shown in Table 2. MnDOT has not formally

established targets for the Non-NHS category, but will monitor the Non-NHS system for compliance with previously established GASB 34 requirements.

RQI targets are based on the percent of miles in the “Good” and “Poor” categories as shown in Table 2. These are statewide targets. It is recognized that some ATPs’ pavements will be better than these and some will be worse. However, it is desirable to have the ATPs’ pavements in somewhat similar conditions so that the public will not encounter drastic differences as they drive around the state.

**Table 2. Ride Quality Index (RQI) Targets by System**

System	Ride Quality Index (RQI)	
	“Good” RQI Target	“Poor” RQI Target
Interstate	70% or more	2% or less
Other-NHS	65% or more	4% or less
Non-NHS	60% or more	10% or less

**STATEWIDE HISTORICAL RQI TRENDS**

In 2015, the smoothness of the state highway system worsened, although not a great deal, with 45 fewer miles in the “Good” category and 60 more miles in the “Poor” category. By system, both the Interstate and Non-NHS systems had a decline in the amount of “Good” roads and an increase in the amount of “Poor” roads. The Other-NHS system, on the other hand, improved in 2015 with more “Good” roads and fewer “Poor” roads compared to 2014.

**2006 - 2015 “Good” RQI Trend (Figure 2)**

From 2014 to 2015, the percent of statewide miles on the Interstate system in “Good” condition decreased from 75.9 percent to 74.5 percent, the Other-NHS system increased from 70.9 percent to 71.5 percent, and the Non-NHS system decreased from 67.2 percent to 66.2 percent. This means there are approximately 52 fewer miles in “Good” condition statewide in 2015 compared to 2014.

Based on the pavement projects listed in the 2016-2019 State Transportation Improvement Program (STIP), the percent of miles in “Good” condition on the Interstate system is expected to increase from its current value of 74.5 percent to 77.0 percent by 2019. The percent of miles in “Good” condition is expected to decrease on the Other-NHS from its current value of 71.5 percent to 66.9 percent and on the Non-NHS system, from 66.2 percent to 63.8 percent.

Statewide, this is an expected decrease of about 390 miles of “Good” roads in four years.

**2006 - 2015 “Poor” RQI Trend (Figure 3)**

From 2014 to 2015, the percent of miles in “Poor” condition on the Interstate system increased from 1.9 to 2.1 percent, the Other-NHS dropped from 3.0 to 2.7 percent, and the Non-NHS increased from 4.4 to 5.1 percent. Overall, there are about 34 more miles in “Poor” condition statewide in 2015 than there were in 2014.

Based on the pavement projects listed in the 2016-2019 STIP, all three systems are expected to get worse, with more miles in “Poor” condition in 2019. The Interstate system is expected to have an increase in the percent of miles in “Poor” condition from 2.1 percent in 2015 to 2.9 percent in 2019. The condition of the Other-NHS system is expected to worsen with an increase in the percent of miles in “Poor” condition from 2.7 percent to 4.2 percent. The

condition of the Non-NHS system is also expected to decline, with a large increase in “Poor” from 5.1 percent to 10.2 percent.

Statewide, this is an expected increase of about 440 miles of “Poor” roads in four years. Once a pavement falls into the “Poor” category it normally will require major rehabilitation or reconstruction to restore any meaningful amount of service life. These types of repairs are expensive, thus making it much harder with a limited budget to recover once the amount of miles in this condition becomes very high.

## **RQI COMPARISON BY ATP**

### **“Good” RQI Comparison (Figures 4, 6, 7 and 8)**

On the Interstate system, four of the six ATPs with Interstate pavement had an increase in the percent of miles in “Good” condition in 2015. The increases ranged from 0.5 to 2.4 percent. ATP-1 had the largest increase (2.4%) followed by ATP-4 (2.1%). This is shown in Figure 4 and Figure 6.

On the Other-NHS system, six of the eight ATPs had an increase in the percent of miles in “Good” condition in 2015. ATP-6 had the largest increase (4.7%) followed by ATP-3 (4.3%) and ATP-8 (3.1%). ATP-1 had a slight decline, while ATP-4 had a fairly large decline (9.0%). This is shown in Figure 4 and Figure 7.

On the Non-NHS system, half of the ATPs had an increase in the percent of miles in “Good” condition ranging from 0.6 to 3.0 percent. ATP-2 had the largest increase (3.0%) followed by ATP-3 (1.9%). ATP-1, ATP-6, ATP-7, and ATP-8 all had a decline, ranging from 3.4 to 4.0 percent. This is shown in Figure 4 and Figure 8.

### **“Poor” RQI Comparison (Figures 5, 9, 10, and 11)**

On the Interstate system, there was very little change in the amount of “Poor” roads in any of the ATPs. Metro had the highest increase at 0.5 percent. All other ATPs changed by 0.3 percent or less. This is shown in Figure 5 and Figure 9.

On the Other-NHS system, six out of the eight ATPs had a decrease in the percent of miles in “Poor” condition, ranging from 0.2 to 1.2 percent. Only ATP-7 and 8 had an increase, both less than one percent. This is shown in Figure 5 and Figure 10.

On the Non-NHS system, six ATPs had an increase in the number of miles in “Poor” condition, ranging from 0.6 (ATP-8) to 2.5 percent (ATP-7). ATP-2 and 4 both decreased the amount of “Poor” roads by 0.2 and 1.3 percent, respectively. This is shown in Figure 5 and Figure 11.

## **AVERAGE REMAINING SERVICE LIFE (ARSL)**

The Average Remaining Service Life (ARSL) is defined as the number of years until the RQI reaches a value of 2.5 or less. This is the point where most people begin to complain that a road’s roughness is objectionable and some type of major rehabilitation is likely needed.

### **2006 - 2015 ARSL Trend (Figure 12)**

The 2015 ARSL was 11.9 years on the Interstate system, 10.3 years on the Other-NHS system, and 8.8 years on the Non-NHS. The ARSL of the Interstate system declined in 2015, from 12.4 to 11.9 years while the ARSL on the Other-NHS and Non-NHS systems increased slightly.

### **ARSL Comparison (Figure 13)**

By ATP, the ARSL ranges from 5.6 to 17.6 years on the Interstate system, from 9.2 to 12.1 years on the Other-NHS, and from 5.8 to 11.8 years on the Non-NHS.

ATP-4 has the highest Interstate ARSL (17.6 years), ATP-3 has the highest Other-NHS ARSL (12.1 years), and ATP-2 has the highest ARSL on the Non-NHS (11.8 years).

ATP-7 has the lowest ARSL on all three systems. The ARSL of its Interstate system (5.6 years), in particular, is very low, roughly half of the next closest ATP.

### **PREDICTED PAVEMENT CONDITIONS AND ACCURACY**

Future year's pavement conditions are predicted using the pavement management system. These predictions are used to provide managers with insight into the impact different funding scenarios will have on pavement conditions. The accuracy of these predictions is reviewed yearly to reassure management that the pavement management system is operating correctly, therefore making it a reliable tool for predicting future needs.

The prediction of future pavement conditions relies on regression curves built into the pavement management system. The curves are either based on section specific historical data or statewide data. If there is adequate historical data since the last rehabilitation on a section, a regression curve is fit through the data and used to predict the RQI. If there is inadequate historical data for the section, or if the regression through the historical data results in an unrealistic curve, then a default curve is used to predict the future RQI. Default curves were developed for all pavement fixes in the pavement management system in the mid-1980s and subsequently updated in 1992 and 2008. The default curves are based on historical statewide performance.

For pavement sections scheduled for work during the STIP, default regression curves are used to predict future conditions. Additionally, an adjustment is made to the construction year to better predict the timing of the expected results. Since data collection cannot wait until all projects are complete, some projects will not have begun, some will still be under construction, and some will be completed when the van is in the area collecting data. This adjustment is made to the construction year of proposed STIP projects to reflect the estimated completeness at the time of data collection.

In 2015, Districts 6, 7, and Metro were driven in the early part of the construction season before few, if any, projects were completed. Therefore, the construction year for all pavement projects listed in the STIP is increased by one year since it will not be until the following year that the impact of this work is measured.

Districts 1, 3, and 8 were driven around mid-construction season when about half of their pavement projects were completed. Since there is no way to predict which projects will be complete when the van is there and which ones will not, half of the projects are randomly chosen and the construction year is increased by one year.

Districts 2 and 4 were driven in late summer or fall when most of their pavement projects were complete. No changes are made to the construction year for projects in the STIP. Thus, the van will likely drive on the new, improved, surface and the impacts of the pavement work will be captured.

Using the above adjustments, predictions of next year’s pavement conditions are made. Table 3 compares the predicted 2015 pavement conditions, using 2014 data, with the actual 2015 measured conditions. A total of 14,316 miles were rated in 2015. A total of 14,308 miles were rated in 2014. This difference in mileage is attributed to some 2-lane to 4-lane conversions, realignments, and jurisdictional transfers. Table 4 and 5 compare the difference in performance and miles on a statewide level.

**Table 3. Comparison of Predicted 2015 versus Actual 2015 RQI by System**

<b>Interstate System RQI Category</b>	<b>Actual 2014 Data</b>	<b>Predicted 2015 Data *</b>	<b>Actual 2015 Data</b>	<b>Difference Predicted vs Actual</b>
Good RQI (RQI > 3.0)	75.9%	74.1%	74.5%	+0.4%
Poor RQI (RQI ≤ 2.0)	1.9%	2.2%	2.1%	-0.1%
<b>Other-NHS System RQI Category</b>	<b>Actual 2014 Data</b>	<b>Predicted 2015 Data *</b>	<b>Actual 2015 Data</b>	<b>Difference Predicted vs Actual</b>
Good RQI (RQI > 3.0)	70.9%	68.9%	71.5%	+2.6%
Poor RQI (RQI ≤ 2.0)	3.0%	2.9%	2.7%	-0.2%
<b>Non-NHS System RQI Category</b>	<b>Actual 2014 Data</b>	<b>Predicted 2015 Data *</b>	<b>Actual 2015 Data</b>	<b>Difference Predicted vs Actual</b>
Good RQI (RQI > 3.0)	67.2%	65.0%	66.2%	+1.2%
Poor RQI (RQI ≤ 2.0)	4.4%	5.3%	5.1%	-0.2%

\*Predictions based on the 2015-2018 STIP by 2014 M-Records

The actual 2015 conditions are very close to what they were predicted to be last year, on all three systems. On a statewide level there are 245 more miles in “Good” condition and 27 fewer miles in “Poor” condition than expected. The difference between the predicted and the actual 2015 condition can be attributed to the following.

1. Construction projects being advanced, reducing “Poor” and increasing “Good”
2. Construction projects not completed, keeping “Poor” from becoming “Good”
3. Maintenance work, keeping roads from falling into “Poor” or out of “Good”
4. A change in a road’s rate of deterioration (either faster or slower)
5. Unforeseen funding or projects, such as the IDIQ program, improving the road

**GOVERNMENT ACCOUNTING STANDARDS BOARD, STATEMENT 34 (GASB 34)**

The Government Accounting Standards Board (GASB), a private, nonprofit organization, was established in 1984 by the Financial Accounting Foundation. The Foundation oversees GASB, provides funding, and appoints the members of GASB’s board. The Foundation has a similar relationship with GASB’s sister organization, the private-sector, standard-setting Financial Accounting Standards Board. GASB’s span of influence covers over 84,000 state, county, and other local governmental units. Also impacted by GASB’s financial reporting standards are organizations such as public utilities, municipal hospitals, and state universities. GASB, which does not impact the federal government, establishes concepts and standards that guide the preparation of external financial reports. GASB establishes generally accepted accounting principles that are utilized by auditors charged with evaluating state and local government financial statements.

In June 1999, GASB established a new financial reporting standard that fundamentally changed the way state and local governments report their financial results. Among other provisions, GASB Statement 34 (GASB 34), “Basic Financial Statements—and Management’s Discussion

and Analysis—for State and Local Governments,” requires that major infrastructure assets acquired or having major additions or improvements in fiscal years beginning after June 15, 1980, be capitalized in financial statements. In addition, the cost of using the assets must be reflected. Source: U.S. Department of Transportation, Federal Highway Administration, Office of Asset Management, Primer: GASB 34 (November 2002).

One of the primary purposes of GASB 34 is to demonstrate to the public, and others, that the agency is maintaining its infrastructure in an acceptable condition and does not have any undisclosed liabilities looming in the future.

In terms of determining the cost of using the assets, GASB 34 allows governments to report either a depreciation expense or to apply an alternative modified/preservation approach. Governments may use the modified approach in lieu of depreciating their assets if they have a systematic approach to managing their assets that, at a minimum, meets the following four requirements:

- Having a current inventory of eligible assets
- Documenting the condition of those assets via a reproducible assessment procedure
- Demonstrating that assets are being preserved at a level predetermined by the government
- Estimating the actual cost to maintain and preserve the assets.

MnDOT has chosen to use the modified/preservation approach since it can meet all the requirements listed above. For the purposes of GASB 34, MnDOT established that the state highway system will be maintained, at a minimum, at the following levels.

- Principal Arterial System: Average PQI of 3.0 or higher
- Non-Principal Arterial System: Average PQI of 2.8 or higher

Figure 12 shows how actual and predicted pavement conditions, based on the 2016-2019 STIP, compare with the established GASB 34 levels. Although MAP-21 requires states to report the condition of the Interstate routes separate from the Other-NHS routes for the purposes of GASB 34 Minnesota will continue with reporting by PA and NPA.

#### **ADDITIONAL INFORMATION**

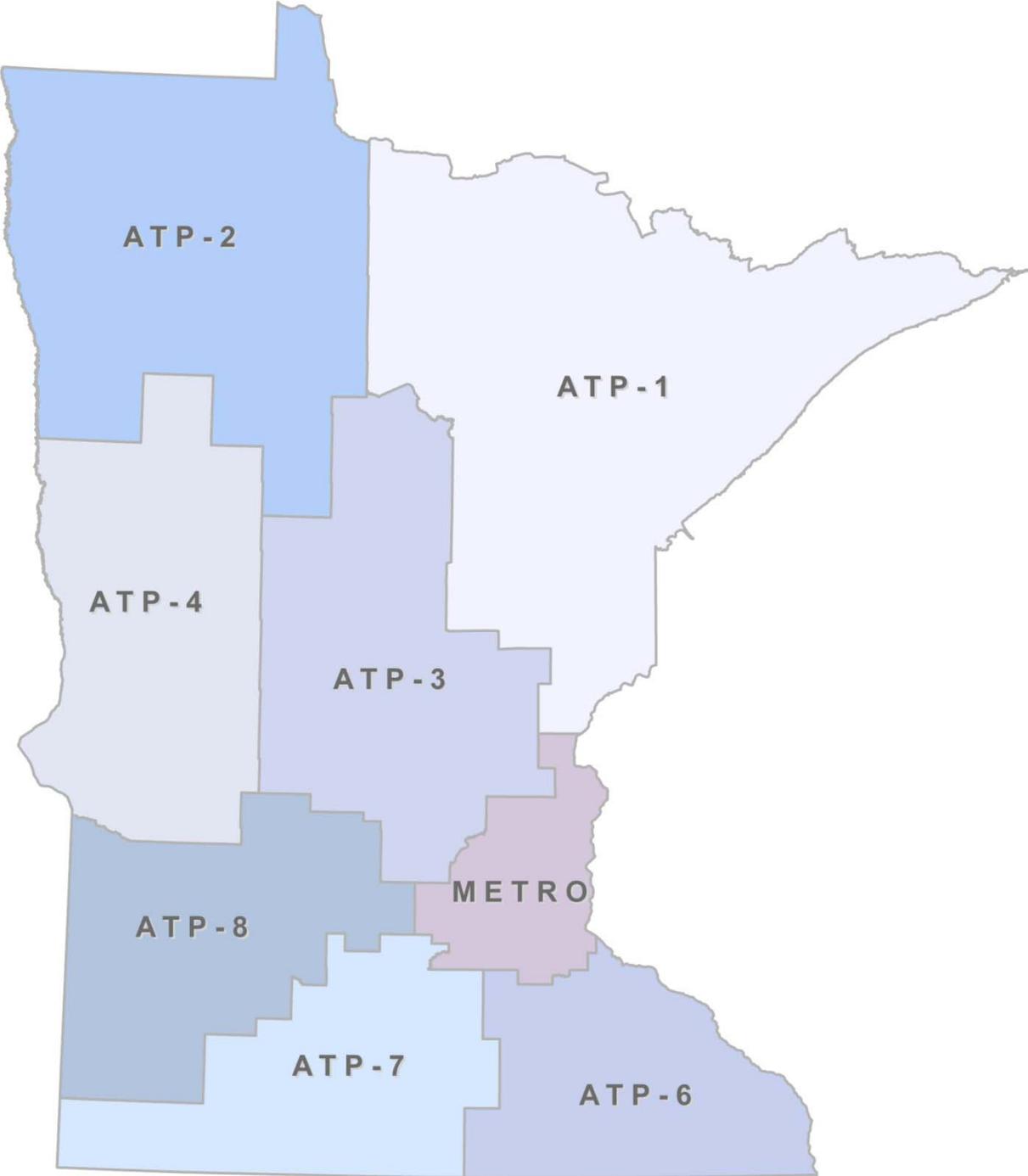
Additional information about the condition and performance of the state highway system, including color-coded maps of the most recent indices, can be obtained from the Pavement Management Unit’s website:

<http://www.dot.state.mn.us/materials/pvmtmgmt.html>

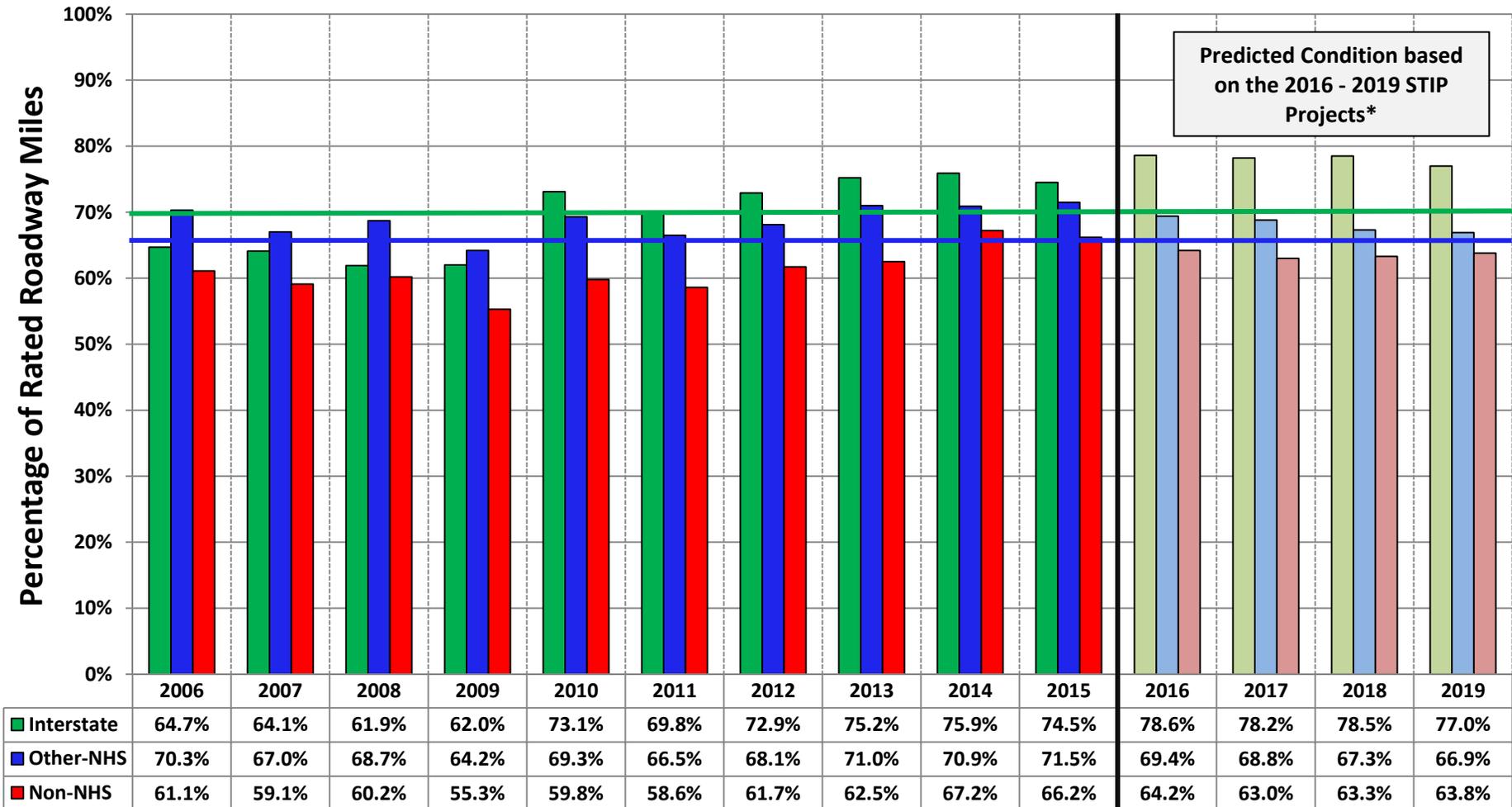
Or by contacting:

David Janisch, Pavement Management Engineer  
MnDOT Office of Materials and Road Research  
1400 Gervais Avenue, Mailstop 645  
Maplewood, MN 55109  
(651) 366-5567  
[dave.janisch@state.mn.us](mailto:dave.janisch@state.mn.us)

**Figure 1. MnDOT's Area Transportation Partnership (ATP) Boundaries**



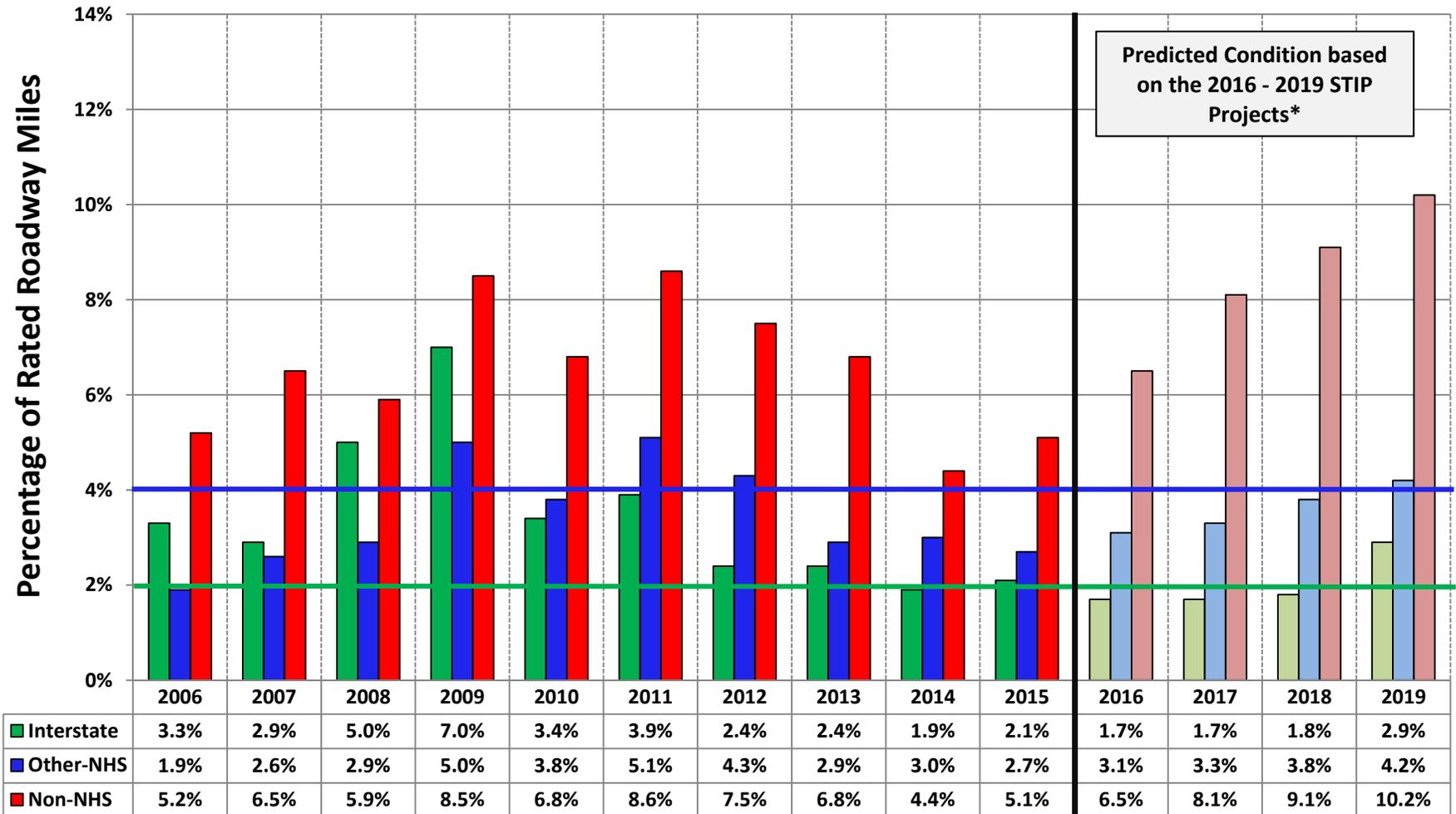
**Figure 2**  
**Statewide “Good” Ride Quality Index**  
 (miles with an RQI greater than 3.0)  
 Actual 2006 - 2015, Predicted 2016 - 2019



**Interstate Target = 70 percent or more**  
**Other-NHS Target = 65 percent or more**  
**Non-NHS Target = 60 percent or more**

\*2015 M-Records with '16 -'19 STIP + PPM

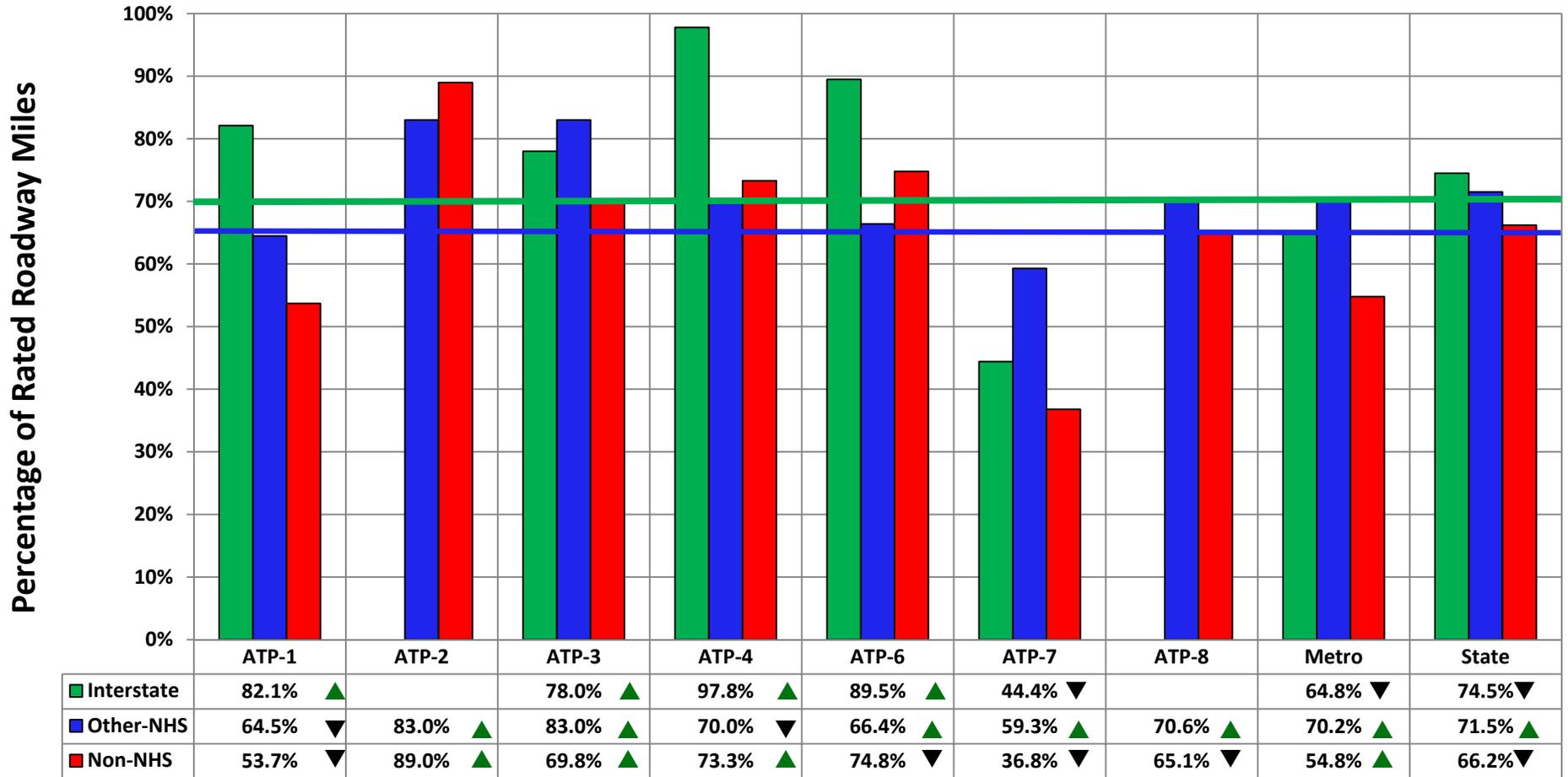
**Figure 3**  
**Statewide “Poor” Ride Quality Index**  
 (miles with an RQI of 2.0 or less)  
 Actual 2006 - 2015, Predicted 2016 - 2019



\*2015 M-Records with '16-'19 STIP + PPM

**Interstate Target** = 2 percent or less  
**Other-NHS Target** = 4 percent or less  
**Non-NHS Target** = 10 percent or less

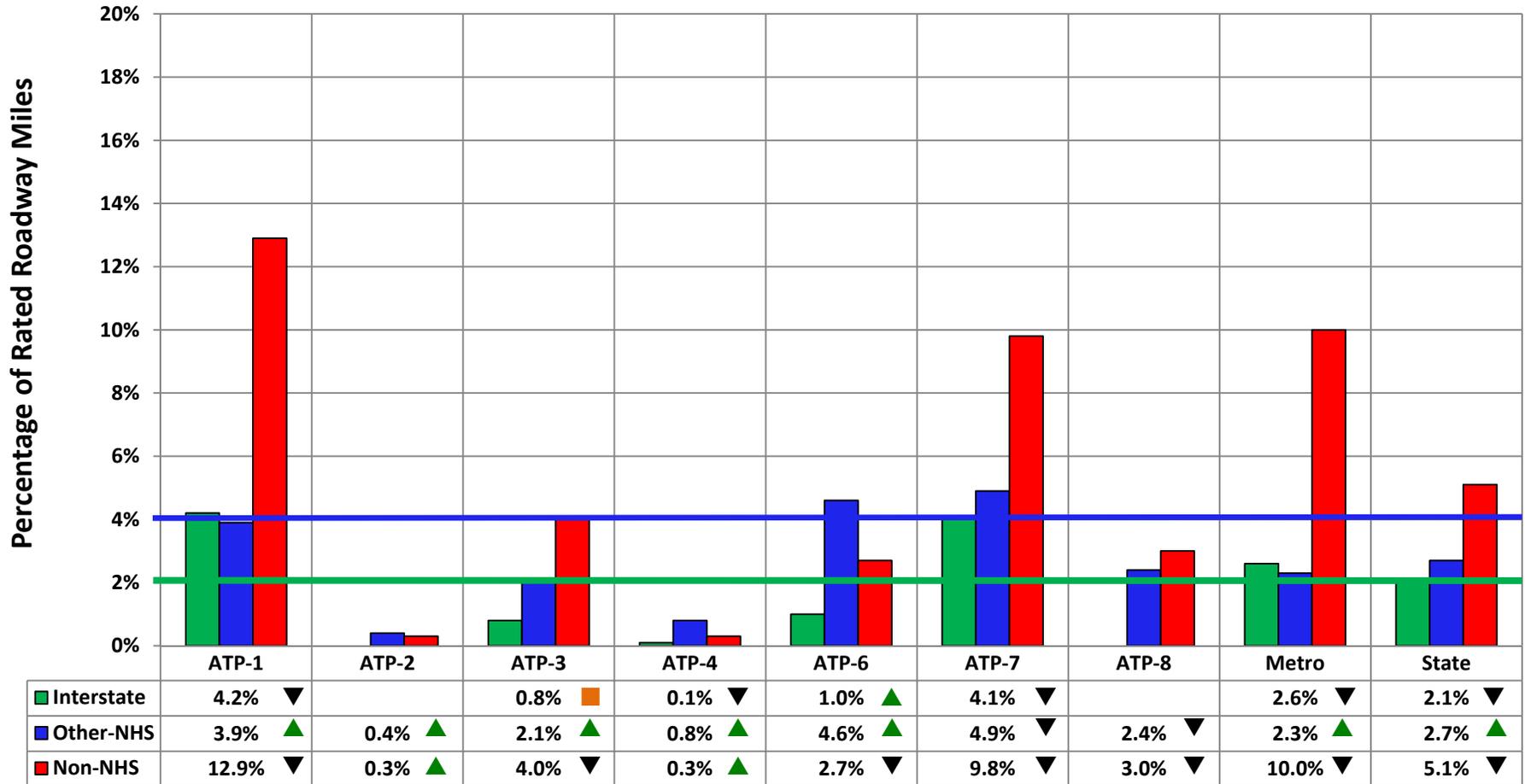
**Figure 4**  
**“Good” Ride Quality Index**  
 (miles with an RQI greater than 3.0)  
 Comparison of 2015 Data by ATP



▲ = Better than 2014      ■ = Same as 2014      ▼ = Worse than 2014

Interstate Target = 70 percent or more  
 Other-NHS Target = 65 percent or more  
 Non-NHS Target = 60 percent or more

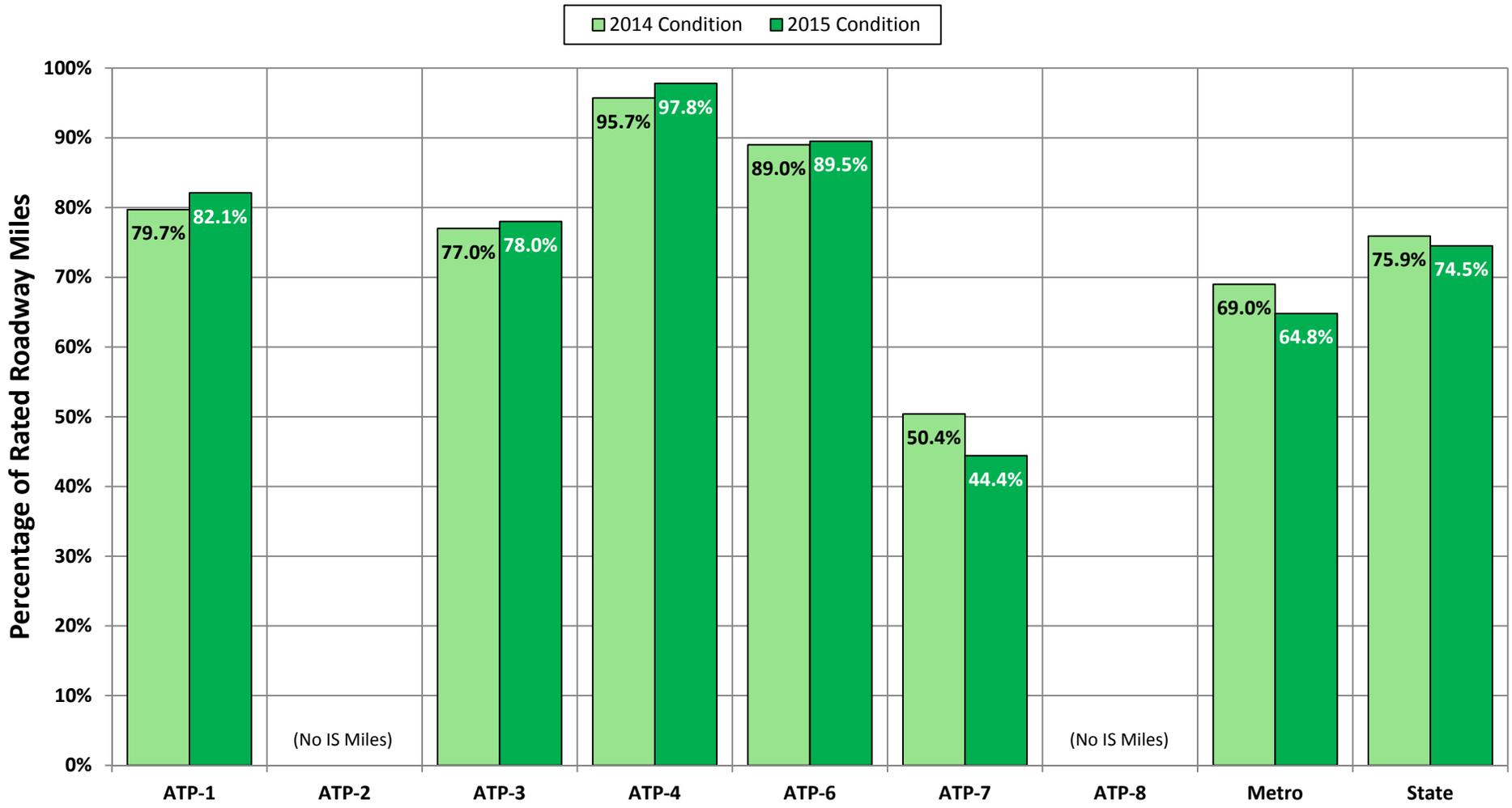
**Figure 5**  
**“Poor” Ride Quality Index**  
 (miles with an RQI of 2.0 or less)  
 Comparison of 2015 Data by ATP



▲ = Better than 2014      ■ = Same as 2014      ▼ = Worse than 2014

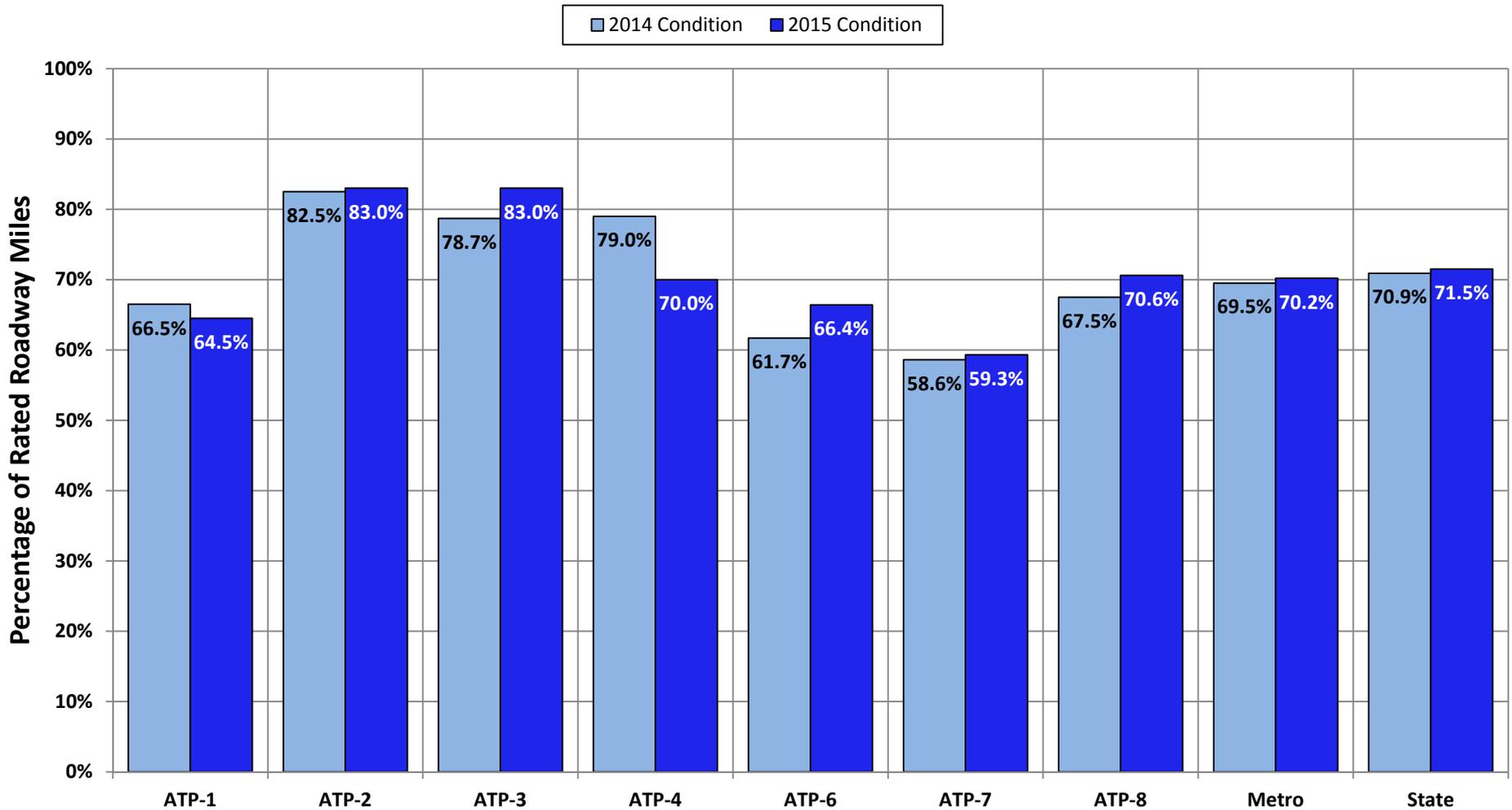
Interstate Target                      = 2 percent or less  
 Other-NHS Target                      = 4 percent or less  
 Non-NHS Target                         = 10 percent or less

**Figure 6**  
**Comparison of “Good” Ride Quality Index**  
 (miles with an RQI greater than 3.0)  
**Interstate System, 2014 – vs – 2015 Condition**



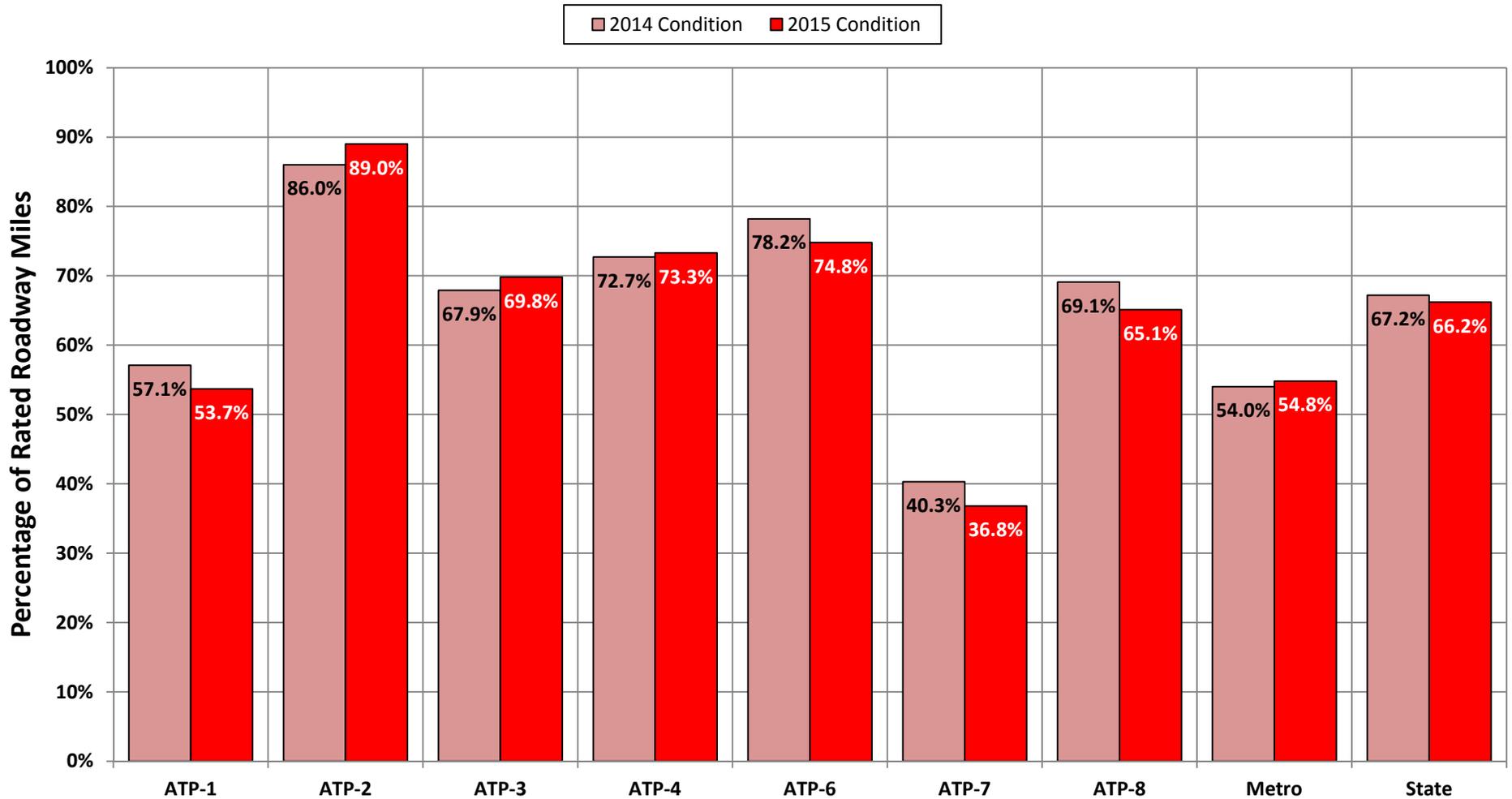
**Interstate Target = 70 percent or more**

**Figure 7**  
**Comparison of “Good” Ride Quality Index**  
 (miles with an RQI greater than 3.0)  
**Other-NHS System, 2014 – vs – 2015 Condition**



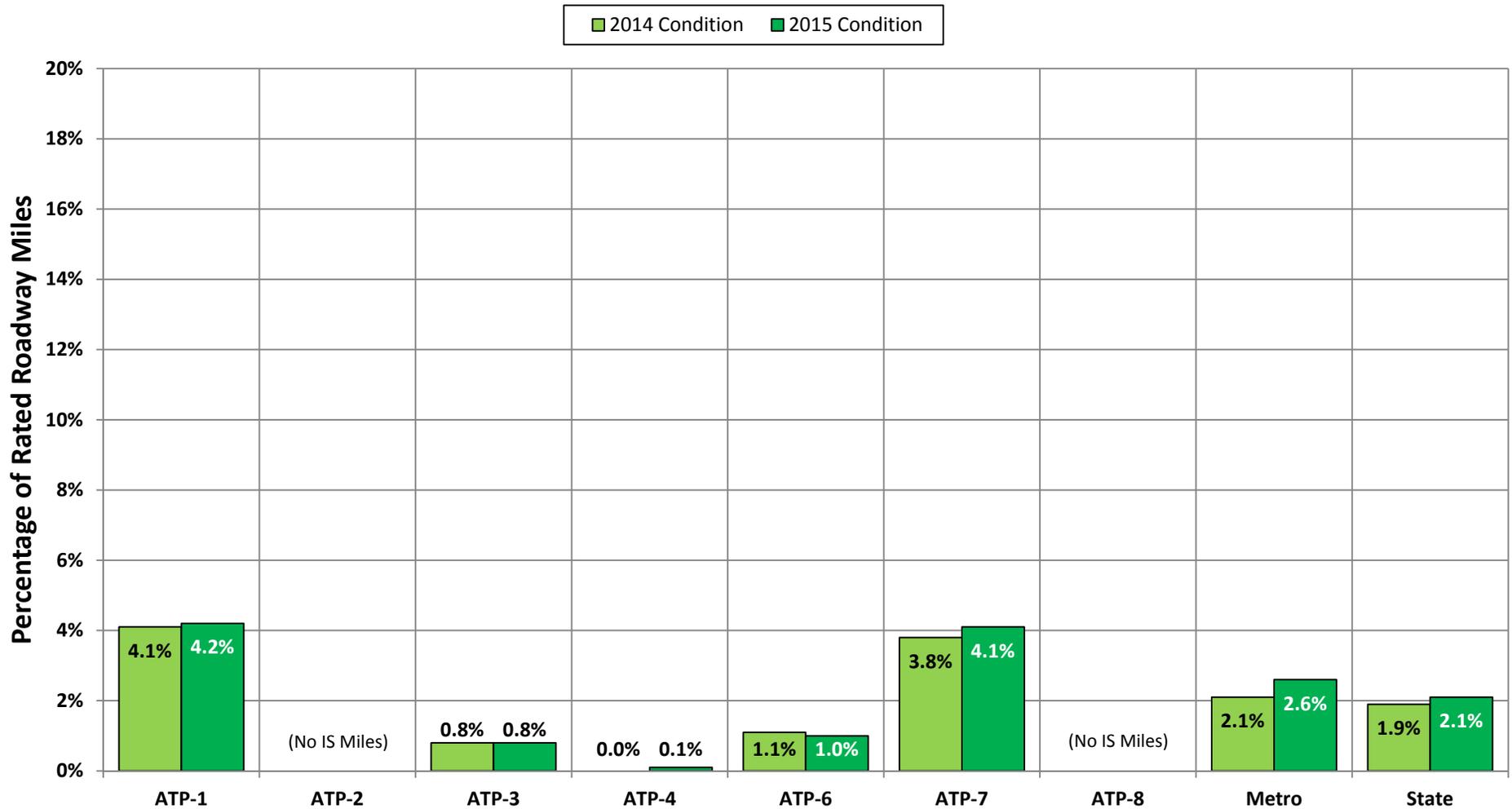
**Other-NHS Target = 65 percent or more**

**Figure 8**  
**Comparison of “Good” Ride Quality Index**  
 (miles with an RQI greater than 3.0)  
**Non-NHS System, 2014 – vs – 2015 Condition**



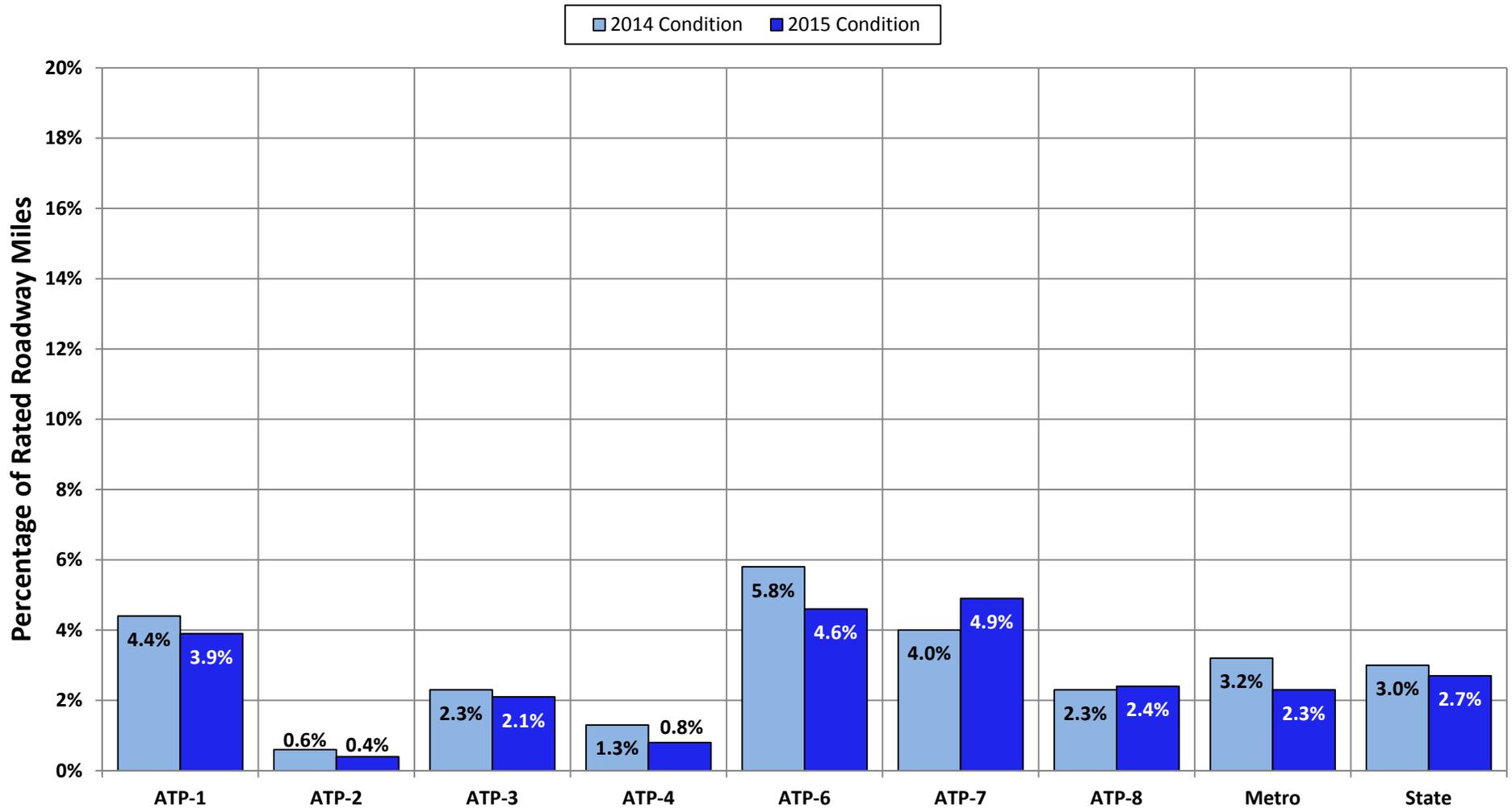
**Non-NHS Target = 60 percent or more**

**Figure 9**  
**Comparison of “Poor” Ride Quality Index**  
 (miles with an RQI of 2.0 or less)  
 Interstate System, 2014 – vs – 2015 Condition



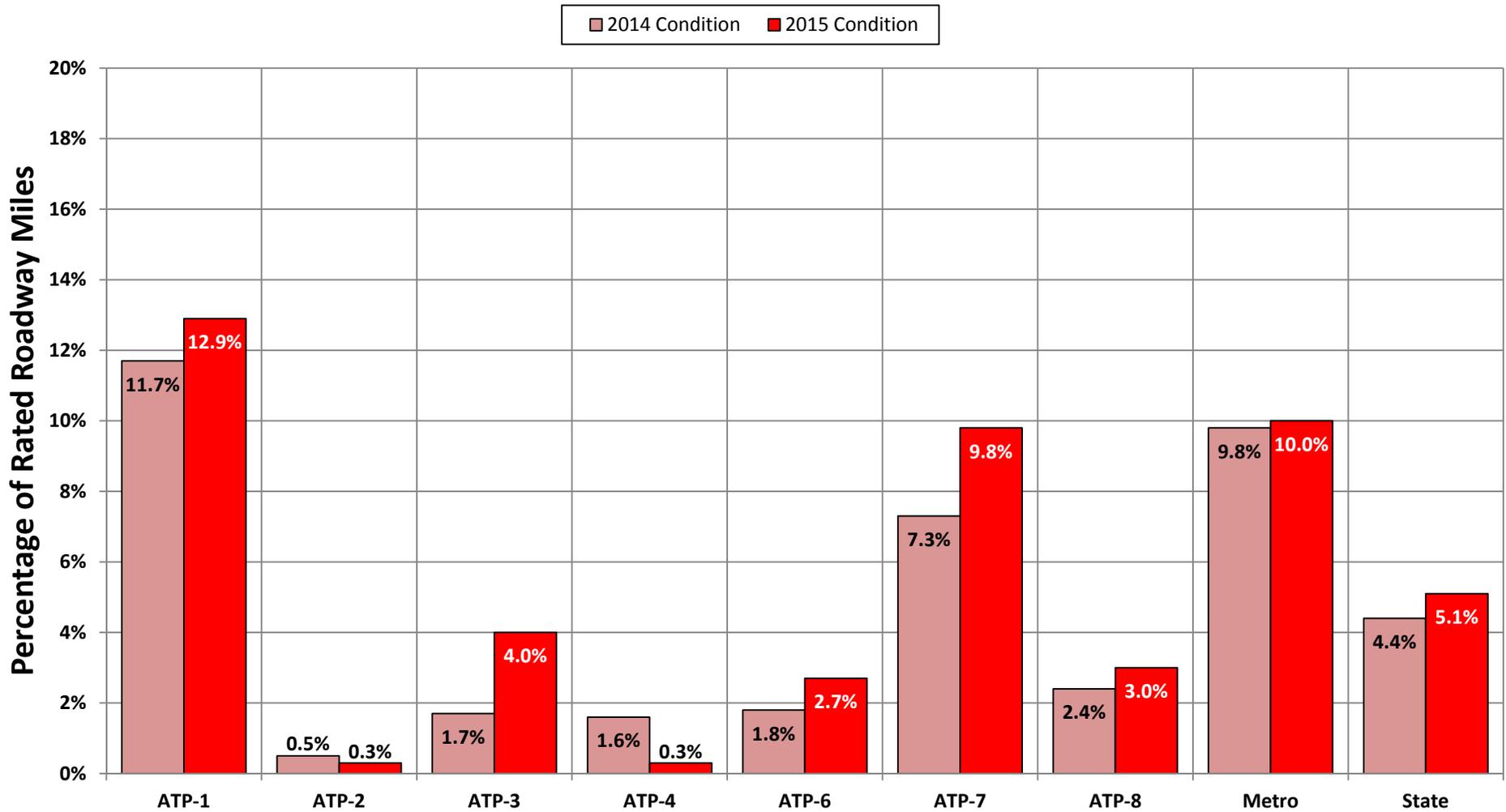
**Interstate Target = 2 percent or less**

**Figure 10**  
**Comparison of “Poor” Ride Quality Index**  
 (miles with an RQI of 2.0 or less)  
**Other-NHS System, 2014 – vs – 2015 Condition**



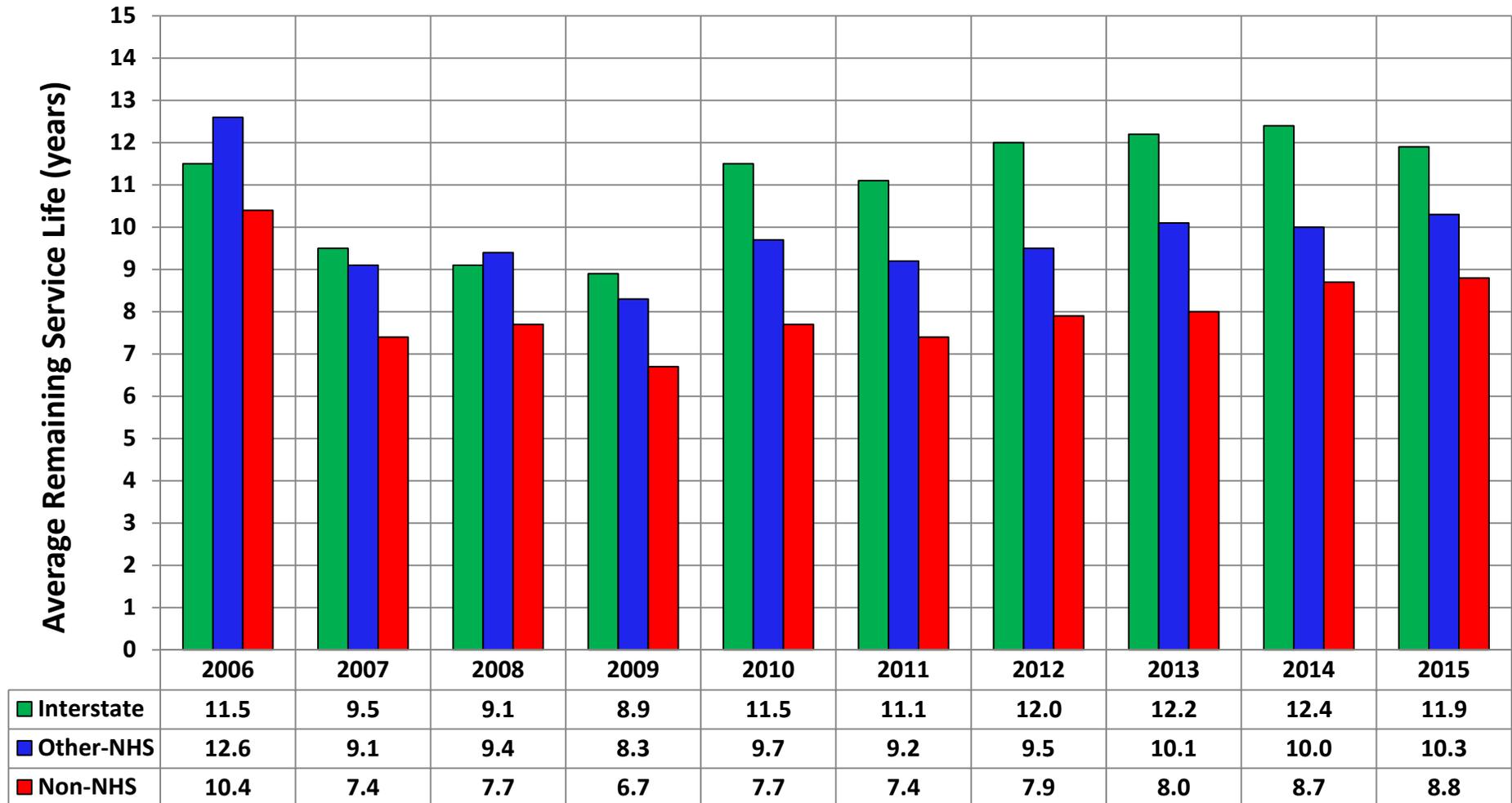
**Other-NHS Target = 4 percent or less**

**Figure 11**  
**Comparison of “Poor” Ride Quality Index**  
 (miles with an RQI of 2.0 or less)  
 Non-NHS System, 2014 – vs – 2015 Condition



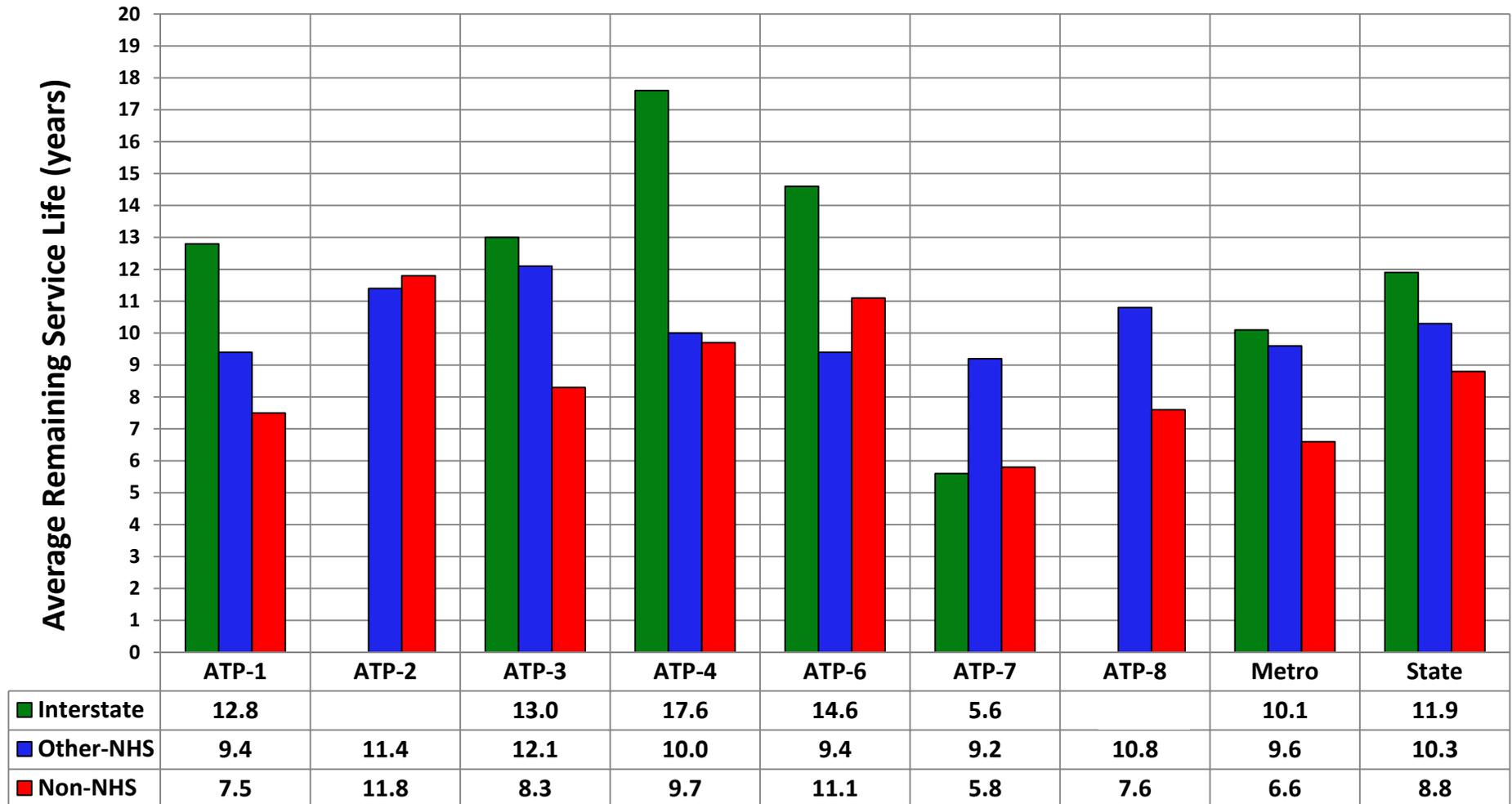
**Non-NHS Target = 10 percent or less**

**Figure 12**  
**Statewide Average Remaining Service Life (ARSL)**  
 (years until RQI reaches 2.5)  
 Actual 2006 - 2015



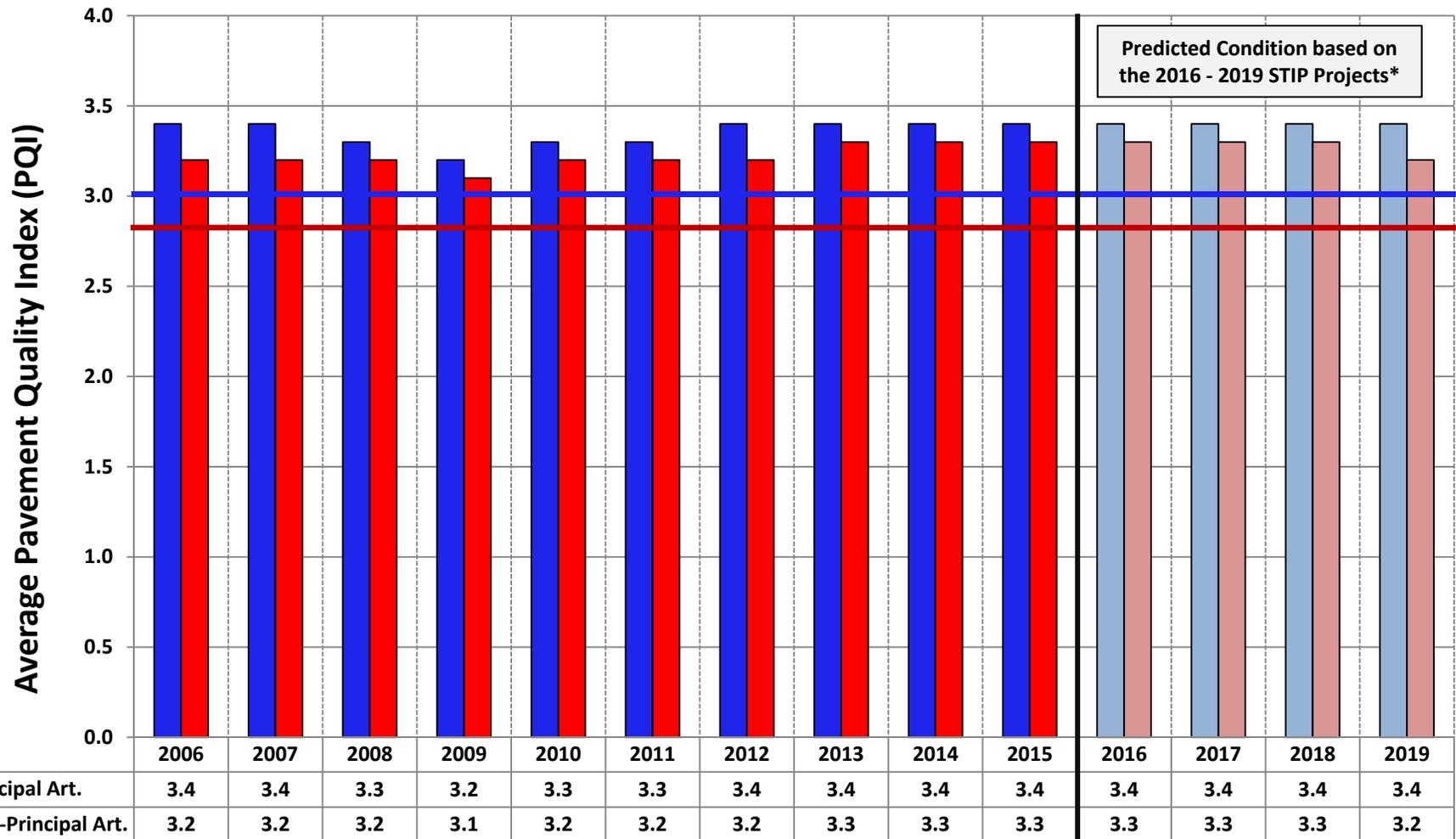
No official targets have been established for ARSL

**Figure 13**  
**Average Remaining Service Life (ARSL)**  
 (years until RQI reaches 2.5)  
 Comparison of 2015 Data by ATP



No official targets have been established for ARSL

**Figure 14**  
**Statewide Average Pavement Quality Index (PQI)**  
**for GASB 34 Reporting**  
**(PQI = Combined Index of Pavement Smoothness and Cracking)**



\*2015 M-Records with '16-'19 STIP + PPM

**Principal Arterial Threshold:**  
**Non-Principal Arterial Threshold:**

**Average PQI  $\geq$  3.0**  
**Average PQI  $\geq$  2.8**



