ITEM 8 – Action
July 18, 2018

Performance Based Planning and Programming – Regional Targets for Highway Systems Performance and Highway Assets

Staff Recommendation: Adopt Resolution R1-2019 to approve regional highway and freight performance measure targets and adopt Resolution R2-2019 to approve regional pavement and bridge performance measure targets

Issues: None

Background: In June, the board was briefed on requirements under the federal performance-based planning and programming (PBPP) rulemaking for MPOs to set targets for highway systems performance and highway assets (bridge and pavement). The board will be asked to adopt highway systems performance and highway asset targets for the region.

TPB R1-2019
July 18, 2018

NATIONAL CAPITAL REGION TRANSPORTATION PLANNING BOARD
777 North Capitol Street, N.E.
Washington, D.C. 20002

RESOLUTION TO ADOPT REGIONAL HIGHWAY AND FREIGHT PERFORMANCE MEASURE TARGETS

WHEREAS, the National Capital Region Transportation Planning Board (TPB), which is the metropolitan planning organization (MPO) for the Washington Region, has the responsibility under the provisions of the Fixing America's Surface Transportation (FAST) Act for developing and carrying out a continuing, cooperative and comprehensive transportation planning process for the Metropolitan Area; and

WHEREAS, the provisions of the FAST Act continued the implementation of performance-based planning and programming to achieve desired performance outcomes for the multimodal transportation system, including the setting of targets for future performance by States and metropolitan planning organizations (MPOs); and

WHEREAS, The Federal Highway Administration (FHWA) published the System Performance: Highway and Freight, Congestion Mitigation and Air Quality (CMAQ) Final Rule on January 18, 2017, with an effective date of May 20, 2018, at which time the state departments of transportation (State DOTs) adopted their initial performance targets in accordance with the rule; and

WHEREAS, State DOTs must submit a Baseline Performance report by October 1, 2018; and

WHEREAS, MPOs must work in coordination with state DOTs to determine whether the MPO will support the state DOTs' targets or develop their own quantifiable four-year targets; and

WHEREAS, MPOs must adopt targets within 180 days after state DOTs adopt initial targets; and

WHEREAS, the performance measures that require the establishment of targets are: 1) Travel Time Reliability (TTR) for both Interstate and Non-Interstate roadways on the National Highway System (NHS), and 2) Truck Travel Time Reliability (TTTR) for Interstate Roadways; and

WHEREAS, the District Department of Transportation (DDOT), Maryland Department of Transportation (MDOT), and the Virginia Department of Transportation (VDOT) were required to establish two and four-year targets for the performance measure of Travel Time Reliability (TTR) on Interstate roadways on the National Highway System (NHS), and only a four-year target for Non-Interstate roadways on the National Highway System (NHS); and

WHEREAS, DDOT, MDOT, and VDOT were required to establish two-year and four-year targets for Truck Travel Time Reliability (TTTR) for roadways on the Interstate System; and

WHEREAS, the TPB staff has coordinated with the state DOTs and reviewed the option of either supporting the state DOTs' targets or establishing regional quantifiable four-year targets for Travel Time Reliability (TTR) and Truck Travel Time Reliability (TTTR); and

WHEREAS, TPB staff has coordinated with the state DOTs to develop and establish regional highway and freight targets that are evidence based, consistent with the targets submitted by each member state DOT, and reflective of the outcomes expected through the implementation of funded projects, programs, and policies; and

WHEREAS, the TPB encourages every jurisdiction in the region to adopt similar goals and calls on the transportation agencies of the region to redouble their efforts to develop projects, programs and policies to achieve increased reliability on roadways; and

WHEREAS, the TPB will use the four-year regional highway and freight target setting process to evaluate the region's progress toward achieving said goals going forward with each future performance period; and

WHEREAS, these highway and freight targets have been reviewed by the TPB Technical Committee at its June 1 and July 6 meetings, and recommends that the TPB approve these targets, and the TPB received a briefing on the draft highway and freight targets at its June 20 meeting,

NOW, THEREFORE, BE IT RESOLVED THAT the National Capital Region Transportation Planning Board adopts the following set of four-year highway and freight targets for the National Capital Region, as described in the attached materials.

Table 1: Travel Time Reliability Region Targets for Interstate and Non-Interstate Roadways

National Highway System	CY 2018 – 2021 Four Year Target
TTR – Interstate Percent of person-miles traveled on the Interstate System that are reliable	58.5%
TTR - Non-Interstate NHS Percent of person-miles traveled on the non-Interstate NHS that are reliable	72.7%

Table 2: Truck Travel Time Reliability Regional Targets for the Interstate Roadways

Interstate System	CY 2018 – 2021 Four Year Target
TTTR Index Ratio of the Interstate System Mileage providing for Reliable Truck Travel Times	2.12

TPB R2-2019
July 18, 2018

NATIONAL CAPITAL REGION TRANSPORTATION PLANNING BOARD
777 North Capitol Street, N.E.
Washington, D.C. 20002

RESOLUTION TO ADOPT REGIONAL PAVEMENT AND BRIDGE PERFORMANCE MEASURE TARGETS

WHEREAS, the National Capital Region Transportation Planning Board (TPB), which is the metropolitan planning organization (MPO) for the Washington Region, has the responsibility under the provisions of the Fixing America's Surface Transportation (FAST) Act for developing and carrying out a continuing, cooperative and comprehensive transportation planning process for the Metropolitan Area; and

WHEREAS, the provisions of the FAST Act continued the implementation of performance-based planning and programming to achieve desired performance outcomes for the multimodal transportation system, including the setting of targets for future performance by States and metropolitan planning organizations (MPOs); and

WHEREAS, The Federal Highway Administration (FHWA) published the Pavement and Bridge Condition Final Rule on January 18, 2017, with an effective date of May 20, 2018, at which time the state departments of transportation (State DOTs) adopted their initial performance targets in accordance with the rule; and

WHEREAS, State DOTs must submit a Baseline Performance report by October 1, 2018; and

WHEREAS, MPOs must work in coordination with state DOTs to determine whether the MPO will support the state DOTs' targets or develop their own quantifiable four-year targets; and

WHEREAS, MPOs must adopt targets within 180 days after state DOTs adopt initial targets; and

WHEREAS, the performance measures that require the establishment of targets are: 1) Percentage of pavements of the Interstate System in Good condition, 2) Percentage of pavements of the Interstate System in Poor condition, 3) Percentage of pavements of the non-Interstate on the National Highway System (NHS) in Good condition, 4) Percentage of pavements of the non-Interstate on the National Highway System (NHS) in Poor condition, 5) Percentage of National Highway System (NHS) bridges classified as in Good condition, and 6) Percentage of National Highway System (NHS) bridges classified as in Poor condition; and

WHEREAS, the District Department of Transportation (DDOT), Maryland Department of Transportation (MDOT), and the Virginia Department of Transportation (VDOT) were required to establish a four-year target for the condition of pavement for the Interstate roadways, and two and four-year targets for the condition of pavement for non-Interstate roadways on the National Highway System (NHS); and

WHEREAS, DDOT, MDOT, and VDOT were required to establish two-year and four-year targets for the condition of National Highway System (NHS) bridges; and

WHEREAS, the TPB staff has coordinated with the state DOTs and reviewed the option of either supporting the state DOTs' targets or establishing regional quantifiable four-year targets for pavement and bridge conditions; and

WHEREAS, TPB staff has coordinated with the state DOTs to develop and establish regional pavement and bridge targets that are evidence based, consistent with the targets adopted by each member state DOT, and reflective of the outcomes expected through the implementation of funded projects, programs, and policies; and

WHEREAS, the TPB encourages every jurisdiction in the region to adopt similar goals and calls on the transportation agencies of the region to redouble their efforts to develop projects, programs and policies to achieve good pavement and bridge conditions; and

WHEREAS, the TPB will use the four-year regional pavement and bridge target setting process to evaluate the region's progress toward achieving said goals going forward with each future performance period; and

WHEREAS, these pavement and bridge targets have been reviewed and recommended for TPB approval by the TPB Technical Committee at its June 1 and July 6 meetings, and recommends that the TPB approve these targets, and the TPB received a briefing on the draft pavement and bridge targets at its June 20 meeting.

NOW, THEREFORE, BE IT RESOLVED THAT the National Capital Region Transportation Planning Board adopts the following set of four-year pavement and bridge targets for the National Capital Region, as described in the attached materials.

Table 1: Regional Pavement Targets for Interstate and Non-Interstate Roadways

Interstate	CY 2018 – 2021 Four Year Target
(1) Percentage of pavements on the **Interstate System** in **Good** condition	**52.7%**
(2) Percentage of pavements on the **Interstate System** in **Poor** condition	**1.7%**
NHS (Non-Interstate)	**CY 2018 – 2021 Four Year Target**
(3) Percentage of pavements on the **NHS** (excl. Interstate) in **Good** condition	**31.1%**
(4) Percentage of pavements on the **NHS** (excl. Interstate) in **Poor** condition	**7.0%**

Table 2: Regional Bridge Targets for NHS

Bridges	CY 2018 – 2021 Four Year Target
(5) Percentage of **NHS** Bridges Classified as in **Good** Condition	**29.8%**
(6) Percentage of **NHS** Bridges Classified as in **Poor** Condition	**3.5%**

SYSTEM PERFORMANCE TARGETS TRAVEL TIME RELIABILITY AND TRUCK TRAVEL TIME RELIABILITY - DRAFT

Performance-Based Planning and Programming

July 2018

National Capital Region
Transportation Planning Board

SYSTEM PERFORMANCE TARGETS: TRAVEL TIME RELIABILITY AND TRUCK TRAVEL TIME RELIABILITY
Adopted on July 20, 2018

ABOUT THE TPB
The National Capital Region Transportation Planning Board (TPB) is the federally designated metropolitan planning organization (MPO) for metropolitan Washington. It is responsible for developing and carrying out a continuing, cooperative, and comprehensive transportation planning process in the metropolitan area. Members of the TPB include representatives of the transportation agencies of the states of Maryland and Virginia and the District of Columbia, 24 local governments, the Washington Metropolitan Area Transit Authority, the Maryland and Virginia General Assemblies, and nonvoting members from the Metropolitan Washington Airports Authority and federal agencies. The TPB is staffed by the Department of Transportation Planning at the Metropolitan Washington Council of Governments (COG).

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Photo Credit: Ron Cogswell/Flickr

ACKNOWLEDGEMENTS
Ting Ma and Stephanie Dock of the District Department of Transportation; Subrat Mahapatra and Meredith Hill of the Maryland Department of Transportation's State Highway Administration; and Mena Lockwood, Amir Shapar, Ben Mannell and Margie Ray of the Virginia Department of Transportation.

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SYSTEM PERFORMANCE

This report summaries the federal requirements for the National Capital Region Transportation Planning Board (TPB), which is a Metropolitan Planning Organization (MPO), in the establishment of performance targets associated with System Performance. This includes performance concerning Travel Time Reliability (TTR) on both the Interstate and Non-Interstate roadways as well as the Truck Travel Time Reliability (TTTR) on Interstate roadways. The targets described in this report meet the MAP-21/FAST performance-based planning and programming (PBPP) requirements and are consistent with the target setting approaches of Maryland, Virginia, and the District of Columbia. These targets were approved by the National Capital Region Transportation Planning Board (TPB) at its regular meeting on (date).

Overview of Performance-Based Planning and Programming Requirements

Under the Moving Ahead for Progress in the 21st Century Act (MAP–21) and reinforced in the Fixing America's Surface Transportation (FAST) Act, federal surface transportation regulations require the implementation of performance management requirements through which states and MPOs will "transition to a performance-driven, outcome-based program that provides for a greater level of transparency and accountability, improved project decision-making, and more efficient investment of federal transportation funds."

The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) have been gradually issuing a set of rulemakings, initially proposed and subsequently final, for the implementation of this performance-based planning and programming (PBPP) process. Each rulemaking lays out the goals of performance for an area of transportation, establishes the measures for evaluating performance, specifies the data to be used to calculate the measures, and then sets requirements for the setting of targets.

Under the PBPP process, states, MPOs, and providers of public transportation must link investment priorities to the achievement of performance targets in the following areas:

- Highway Safety;
- Highway Assets: Pavement and Bridge Condition;
- System Performance (Interstate and National Highway System, Freight Movement on the Interstate System, and the Congestion Mitigation and Air Quality Improvement Program); and
- Transit Safety and Transit Asset Management.

The final Statewide and Metropolitan Planning Rule, published May 27, 2016, provides direction and guidance on requirements for implementation of PBPP, including specified measures and data sources, forecasting performance, target-setting, documentation in the statewide and metropolitan long-range transportation plans and Transportation Improvement Programs (TIPs), and reporting requirements. The initial part of the PBPP process will require coordination and agreement on specific responsibilities for each agency in accordance with the planning rule.

Figure 1: National Highway System within the TPB Planning Area

NATIONAL HIGHWAY SYSTEM

A number of the MAP-21 performance measures are directly involved the National Highway System[1] The National Highway System (NHS) includes the Interstate Highway System as well as other roads important to the nation's economy, defense, and mobility. The NHS was developed by the Department of Transportation (DOT) in cooperation with the states, local officials, and metropolitan planning organizations (MPOs). Figure 1 illustrates the extent of the NHS within the TPB Planning Area. The darkened roadways are the NHS. With the adoption of MAP-21 on October 1, 2012, the NHS became the "enhanced-NHS" by adding roads that were previously classified as principal arterials but not yet part of the System. These Interstate and Non-Interstate roadways on the NHS are the primary roadways for the assessment of MAP-21 Performance-Based Planning and Programming. When performance measures are referring to the Interstate or Non-Interstate roadways on the NHS, it is the MAP-21 "enhanced-NHS."

State DOTs have the ability to make modifications to the NHS by either removing or adding additional roadways. This can be done in writing to the FHWA Division Office. Supporting documents must be included such as maps and documentation of the coordination with the effected jurisdictions. Following that, FHWA will review, summarize, and move for recommendation to FHWA HQ. With the approval, FHWA HQ will make modifications to the NHS.

Overview of System Performance Measures

The Federal Highway Administration (FHWA) published the System Performance: Highway and Freight, Congestion Mitigation and Air Quality (CMAQ) Final Rule on January 18, 2017, with an effective date of May 20, 2017, followed by one year for implementation. Accordingly, state DOTs had until May 20, 2018 to initially set targets. The rule requires state DOTs to set targets for three performance measures concerning Highway and Freight: 1) Interstate Travel Time Reliability (TTR), 2) National Highway System (NHS) TTR, and 3) Freight Reliability (Truck Travel Time Reliability (TTTR)).

[1] https://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/

In addition, the FHWA requires state DOTs to set three performance measures under the CMAQ Program: 1) Peak Hour Excessive Delay (PHED), 2) Mode Share, and 3) Emission Reductions.

This report covers the Highway and Freight Performance Measures, specifically, TTR and TTTR, and provides an overview of the measures, data collection, and the methodology and forecasting methods used for future target setting.

Table 1: Summary of System Performance Measures

	Performance Measures
National Highway System	(1) **Interstate Travel Time Reliability (TTR)** - Percent of person-miles traveled on the Interstate System that are reliable
	(2) **NHS (Non-Interstate) Travel Time Reliability (TTR)** - Percent of person-miles traveled on the non-Interstate NHS that are reliable
	Performance Measures
Freight Movement	(4) **Freight Reliability (TTTR)** Measurement of travel time reliability on the Interstate System using Truck Travel Time Reliability (TTTR) Index.

TRAVEL TIME RELIABILITY AND TRUCK TRAVEL TIME RELIABILITY

The Travel Time Reliability (TTR) measure assesses the reliability of roadways on the Interstate and Non-Interstate (NHS) systems. TTR is defined by the FHWA as the percent of person-miles on the (Interstate/NHS) that are reliable. Concerning freight, reliability is the ratio of the Interstate System Mileage providing for reliable Truck Travel Time Reliability (TTTR). Data are derived from the travel time data set found in the National Performance Management Research Data Set (NPMRDS). The metrics to be used are Level of Travel Time Reliability (LOTTR) and the TTTR Index.

Regarding the roles and responsibilities of both states and MPOs, state DOTs are required to establish two and four-year targets for the Interstate, but only a four-year target for the TTR of the NHS by May 20, 2018. These targets will be included in the state's baseline performance period report due to the FHWA on October 1, 2018. MPOs are required to either support the State targets or establish their own quantifiable four-year targets within 180 days of the State target establishment.

On December 18, 2017, TBP staff led a webinar with representatives of Virginia, Maryland, and the District of Columbia departments of transportation for the purposes of coordination and sharing information regarding these performance measures, particularly with regards for target setting and forecasting. On May 20, 2018 state DOTs were required to establish statewide targets for TTR and TTTR. Below Table 2 provides both the TTR for Interstate and Non-Interstate roadways. Table 3 provides information on the state forecasted targets for TTTR.

Table 2: Summary of TTR Statewide Two and Four-Year Targets

State	Interstate or Non-Interstate	Two-Year State Target	Four-Year State Target
District of Columbia	Interstate	24.0%	23.0%
	Non-Interstate	Not Applicable	60.0%
Maryland	Interstate	72.1%	72.1%
	Non-Interstate	Not Applicable	81.7%
Virginia	Interstate	82.2%	82.0%
	Non-Interstate	Not Applicable	82.5%

Table 3: Summary of TTTR Statewide Two and Four-Year Targets

State	Two-Year Target	Four-Year Target
District of Columbia	4.0	4.0
Maryland	1.87	1.88
Virginia	1.54	1.57

TPB FORECASTING

TPB staff obtained data from the NPMRDS, and the utilization of RITIS with the MAP-21 widget. This enabled staff to review the TTR and TTTR for the TPB Planning Area from 2014 to 2017. With this collection of data, staff applied three general methodologies to determine performance forecasting: the extrapolation of measured performance, the use of travel demand model data, or the average of the two.

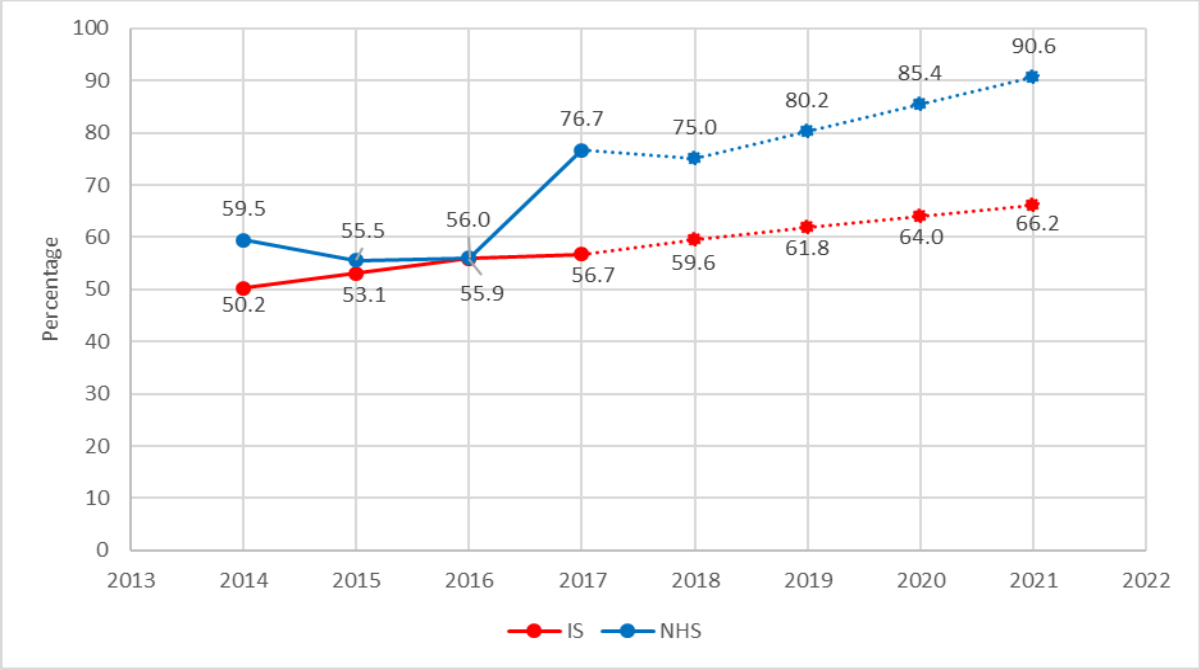
- Extrapolation of Measured Performance
    - For this approach, measured data for the previous years of 2014 through 2017 would be selected either by month or year. This data would then be extrapolated, via polynomial regression, through the year 2021. This would cover both the two and four-year targets. This approach would result in either a fitted line or a best fit curve as a means of forecasting.
- Travel Demand Model

- In 2016 TPB produced a travel demand model which produced congestion/related outputs for modelled years 2016, 2020,2025, etc. Forecasting will be achieved by utilizing such outputs as Percentage of Congested AM Peak Hour VMT estimates to project change in congestion, applying the percentage changes to measured performance.

- Averaging
  - Taking the average of both the extrapolation of measured performance and the utilization of the Travel Demand Model as a means of forecasting the targets.

The following pages will show and explain charts of both approaches. The charts showing the TTR for Interstate and NHS roadways are in terms of the percent of person miles on a roadway that is reliable. Charts illustrating TTTR are measured using a scale/index to determine the reliability of conditions for trucks. In all cases, the percentages shown are based on the TTR or TTTR for the TPB region.

Figure 2: Extrapolation Method for Interstate and Non-Interstate Roadways for TTR



Figures 2 and 3 illustrate the extrapolation of the previous NPMRDS data collected from years 2014, 2015, and 2016 for TTR and TTTR. Measures were extrapolated from 2018 to 2021, which cover both two and four-year target years of 2019 and 2021. The TTR for Interstate and Non-Interstate roadways shows an overall increase in the TTR, which translates into roadways are becoming more reliable in regard to congestion. Figure 2 shows a decreasing TTTR Index for the roadways. This translates into commercial trucks having achieved more reliable routes of movement with respect to congestion.

Figure 3: Extrapolation Method for Interstate Roadways for TTTR

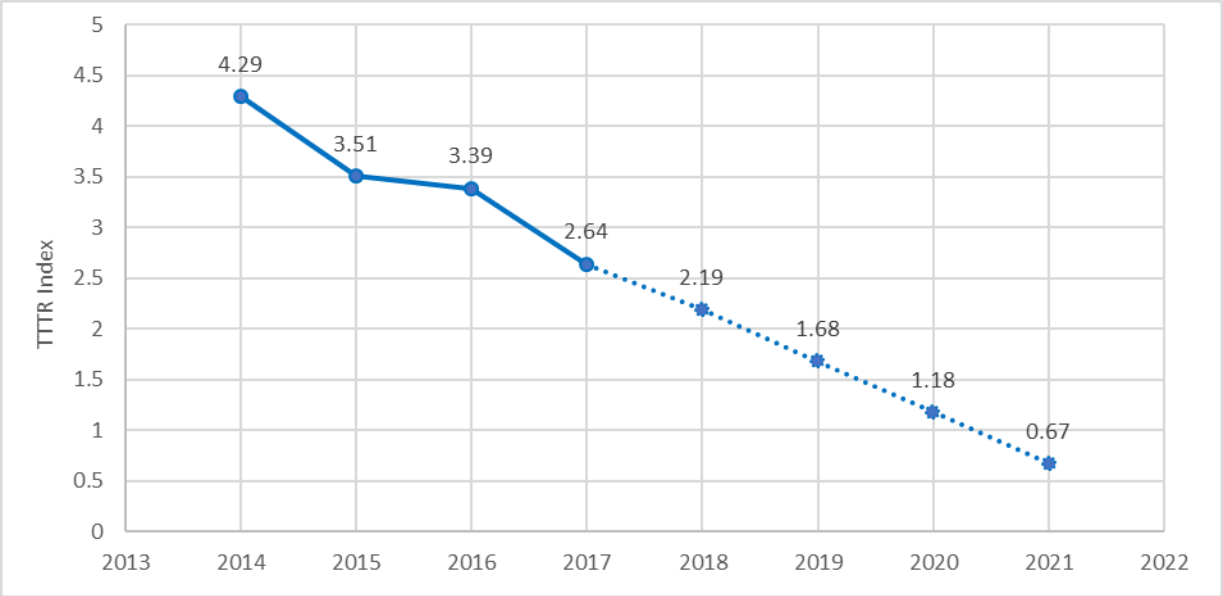


Figure 4 and 5 below illustrates the application of the TPB Travel Demand Model on the performance measures TTR and TTTR. The Travel Demand Model does not provide a specific output for TTR or TTTR, however, it does provide called Percentage of Congested AM Peak Hour VMT. Taking this output, the rate of change was calculated from the TPM Travel Demand Model from year 2017 to 2025. This rate was then applied to the 2016 recorded TTR and TTTR data. The 2016 data was utilized instead of 2017 data, due to the belief that 2017 data is an outlier. With this number and the collected data, a compounded growth rate was calculated far enough to capture both two and four-year target years. Figure 3 illustrates the reliability of roadways slowly decreasing over time. The same steady decrease of the TTTR is shown in Figure 4.

Figure 4: Travel Demand Model for Interstate and Non-Interstate Roadways for TTR

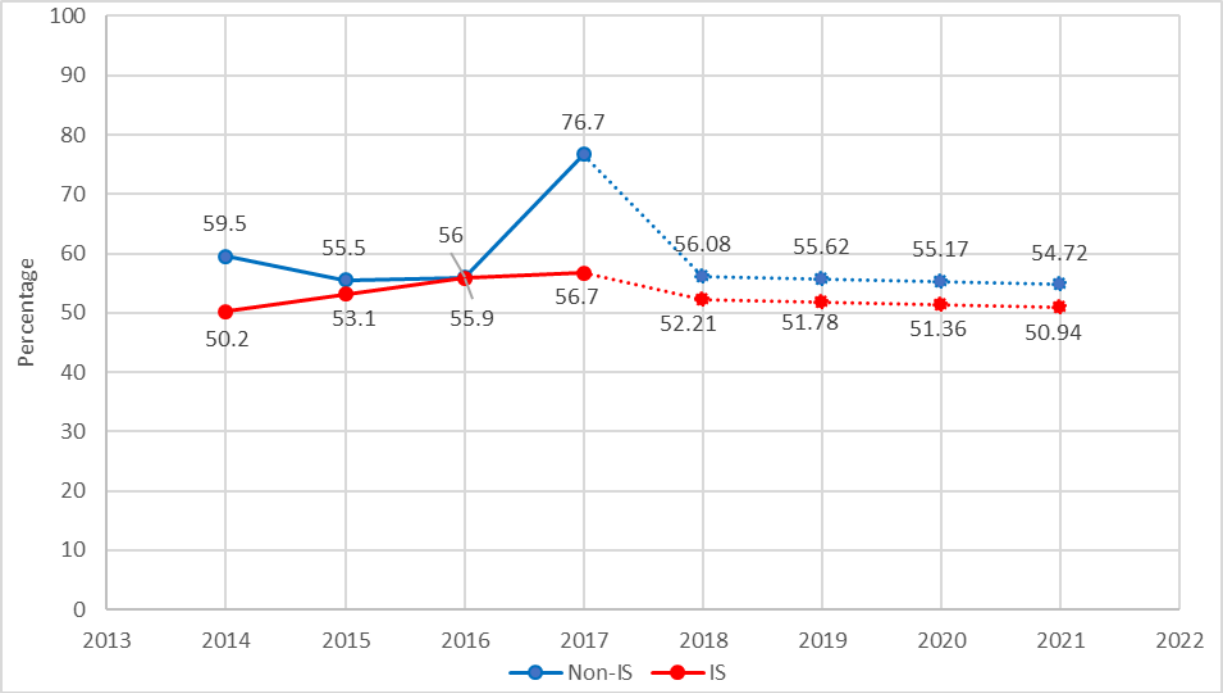


Figure 5: Travel Demand Model for Interstate Roadways for TTTR

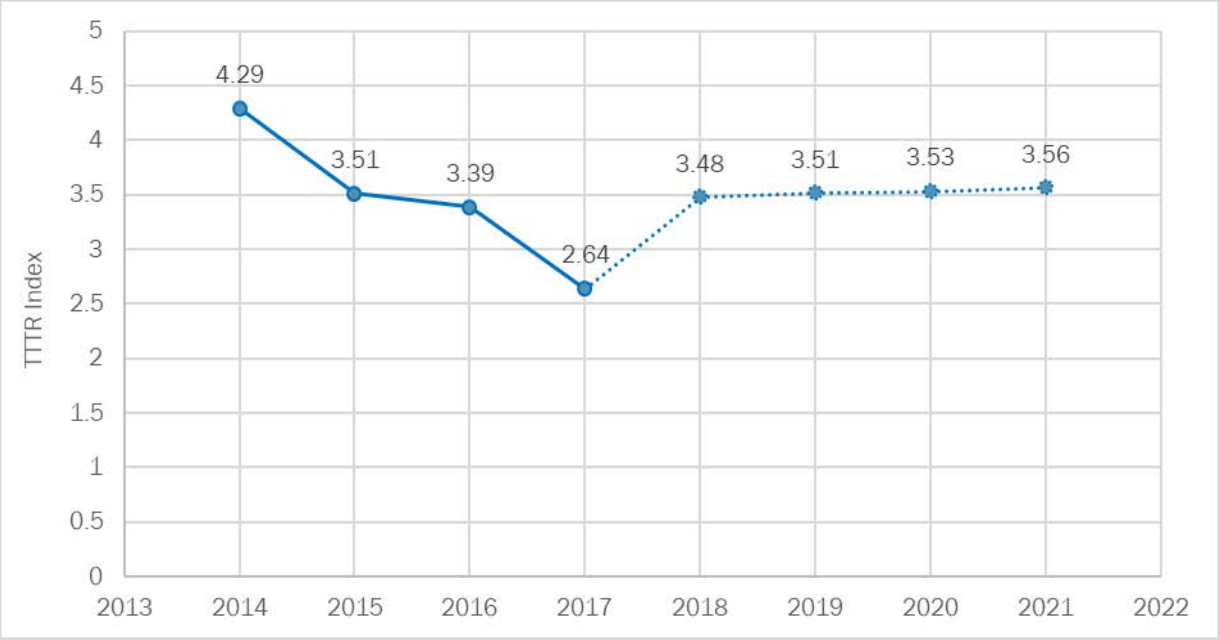


Figure 6: Averaging of Extrapolation and Travel Demand Model Methods for TTR

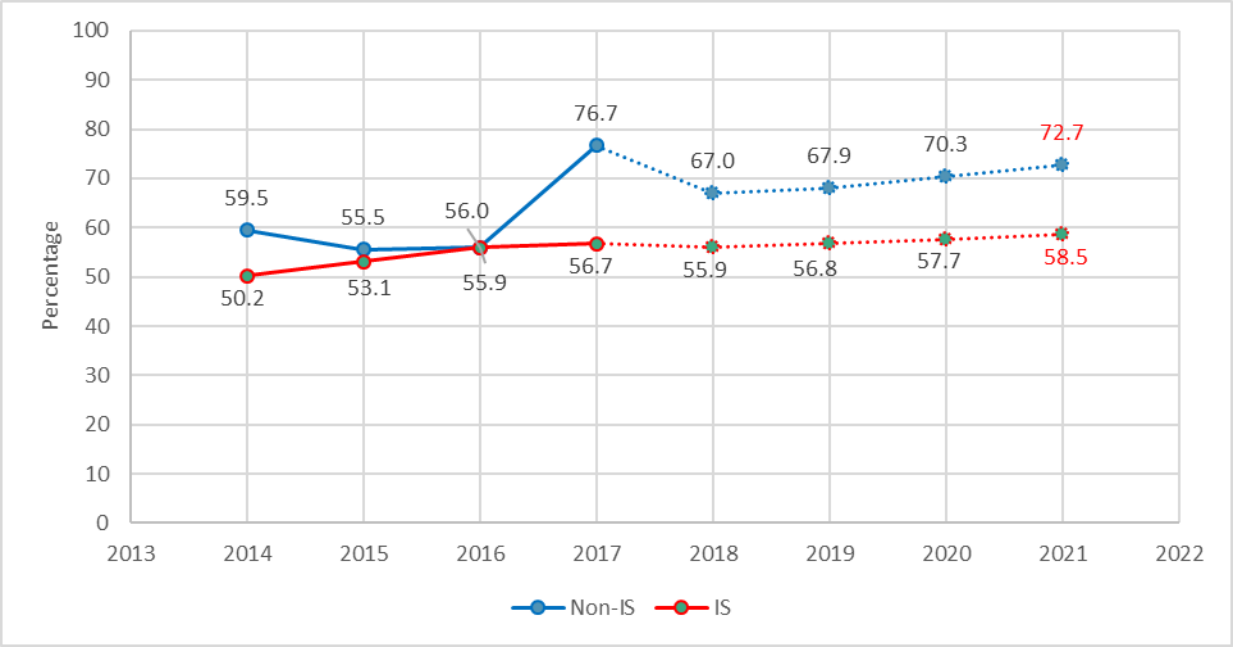
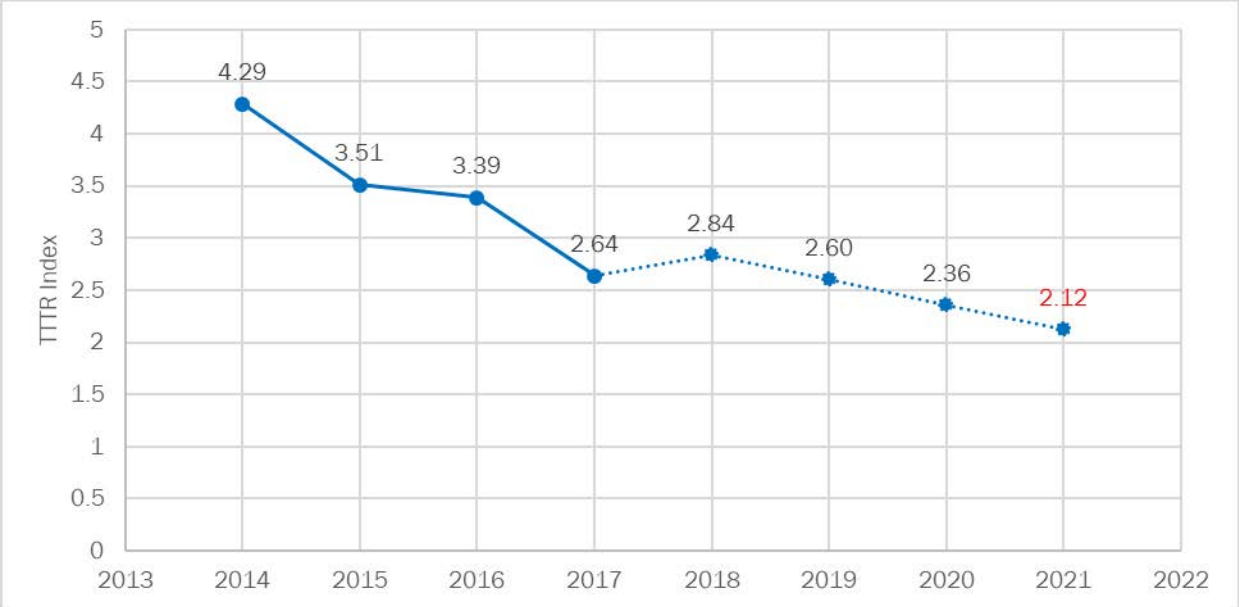


Figure 7: Averaging of Extrapolation and Travel Demand Model Methods for TTTR



Figures 6 and 7 above simply take the average of both the extrapolation and the travel demand model methods. This was selected at the methodology to utilize in the TPB's forecasting of its own quantifiable four-year targets for both TTR and TTTR.

TPB Target Setting

Based on the performance data and forecasting methodology in the previous section, Tables 3 and 4 show the regional four-year targets, covering the period 2018 through 2021, for the TPB planning area for the three performance measures.

Table 4: Regional Travel Time Reliability Targets for the Interstate and Non-Interstate Roadways

Travel Time Reliability	Four-Year Target (2018 – 2021)
Interstate (NHS)	58.5%
Non-Interstate (NHS)	72.7%

Table 5: Regional Truck Travel Time Reliability for the Interstate System Roadways

Truck Travel Time Reliability	Four-Year Target (2018 – 2021)
Interstate System	2.12

PAVEMENT AND BRIDGE CONDITION - DRAFT

Performance-Based Planning and Programming

July 2018

National Capital Region
Transportation Planning Board

PAVEMENT AND BRIDGE CONDITION: PERFORMANCE-BASED PLANNING AND PROGRAMMING
Adopted on July 18, 2018

ABOUT THE TPB
The National Capital Region Transportation Planning Board (TPB) is the federally designated metropolitan planning organization (MPO) for metropolitan Washington. It is responsible for developing and carrying out a continuing, cooperative, and comprehensive transportation planning process in the metropolitan area. Members of the TPB include representatives of the transportation agencies of the states of Maryland and Virginia and the District of Columbia, 24 local governments, the Washington Metropolitan Area Transit Authority, the Maryland and Virginia General Assemblies, and nonvoting members from the Metropolitan Washington Airports Authority and federal agencies. The TPB is staffed by the Department of Transportation Planning at the Metropolitan Washington Council of Governments (COG).

CREDITS
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Photo Credit: Tomi Knuutila/Flickr

ACKNOWLEDGEMENTS
Geoffrey Hall, Maurice Agostino, and Meredith Hill of the Maryland Department of Transportation's State Highway Administration; Edward Carpenter, Yared Tesfaye and Wolde Makkonnen of the District Department of Transportation; and Adam Matteo and Tanveer Choudhury of the Virginia Department of Transportation.

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PAVEMENT AND BRIDGE CONDITION

This report provides an overview of the performance measures concerning the condition of bridges and pavements within the National Capital Region Transportation Planning area. This information will be useful for determining performance targets and coordinating with the Departments of Transportation of the states of Maryland, Virginia, and the District of Columbia, as required by MAP-21. The National Performance Management Measures; Assessing Pavement Condition for the National Highway Performance Program 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 on May 20, 2017, with one year for implementation.

Overview of Performance-Based Planning and Programming Requirements

Under the Moving Ahead for Progress in the 21st Century Act (MAP–21) and reinforced in the Fixing America's Surface Transportation (FAST) Act, federal surface transportation regulations require the implementation of performance management requirements through which states and MPOs will "transition to a performance-driven, outcome-based program that provides for a greater level of transparency and accountability, improved project decision-making, and more efficient investment of federal transportation funds."

The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) have been gradually issuing a set of rulemakings, initially proposed and subsequently final, for the implementation of this performance-based planning and programming (PBPP) process. Each rulemaking lays out the goals of performance for an area of transportation, establishes the measures for evaluating performance, specifies the data to be used to calculate the measures, and then sets requirements for the setting of targets.

Under the PBPP process, states, MPOs, and providers of public transportation must link investment priorities to the achievement of performance targets in the following areas:

- Highway Safety;
- Highway Assets: Pavement and Bridge Condition;
- System Performance (Interstate and National Highway System, Freight Movement on the Interstate System, and the Congestion Mitigation and Air Quality Improvement Program); and
- Transit Safety and Transit Asset Management.

The final Statewide and Metropolitan Planning Rule, published May 27, 2016, provides direction and guidance on requirements for implementation of PBPP, including specified measures and data sources, forecasting performance, target-setting, documentation in the statewide and metropolitan long-range transportation plans and Transportation Improvement Programs (TIPs), and reporting requirements. The PBPP process requires coordination and agreement on specific responsibilities for each agency in accordance with the planning rule.

Pavement and Bridge Condition Performance Measures

The Pavement and Bridge Condition Performance Measures final rule, published in the Federal Register on January 18, 2017, establishes measures for State DOTs to assess the condition of pavements on the non-Interstate NHS (National Highway System); pavements on the Interstate System (IS); and bridges carrying the NHS, including on- and off-ramps connected to the NHS. Targets must be set for six particular areas; 1) Percent of pavements on the Interstate System in good condition, 2) Percent of pavements on the IS in poor condition, 3) Percent of pavements on the NHS in good condition, 4) Percent of pavements on the NHS in poor condition, 5) Percentage of NHS bridge deck classified in good condition, 6) Percentage of NHS bridge deck classified in poor condition.

Data for these performance measures are available through databases overseen by the Federal Highway Administration, the Highway Performance Monitoring System (HPMS) and the National Bridge Inventory (NBI). State departments of transportation have the responsibility to report data to HPMS and NBI annually.

Table 1: Summary of Pavement and Bridge Performance Measures

	Performance Measures
Pavements	Percent of pavements on the IS in good condition
	Percent of pavements on the IS in poor condition
	Percent of pavements on the NHS in good condition
	Percent of pavements on the NHS in poor condition
Bridges	Percentage of NHS bridge deck classified in good condition
	Percentage of NHS bridge deck classified in poor condition

In terms of calculating the metrics for this measure (pavement) the HPMS database includes the data for calculating good and poor metrics and the measures. Considerations include the roughness, cracking, and rutting for asphalt pavement and faulting for concrete pavement. The measures are aggregated by lane miles. In addition, HPMS pavement data collection requirements have been revised to require more comprehensive collection of data for the NHS routes.

For the bridge condition performance measures, the measures are calculated based on deck area and a classification of the bridge structure condition. The classification is based on NBI condition ratings for the Deck, Superstructure, Substructure, and Culvert. Condition is determined by the lowest rating of deck, superstructure, substructure, or culvert. If the lowest rating is greater than or equal to 7, the bridge is classified as good; if is less than or equal to 4, the classification is poor. (Bridges rated below 7 but above 4 will be classified as fair; there is no related performance measure.) Deck area is computed using NBI criteria of Structure Length, Deck Width or Approach Roadway Width (for some culverts).

STATE DOT AND MPO TARGET SETTING AND REPORTING RESPONSIBILITIES

Pavement

State DOTs must establish targets, regardless of ownership, for the full extent of the Interstate and non-Interstate NHS. These must be statewide two and four-year targets for the non-Interstate NHS and four-year targets for the Interstate by May 20, 2018. Targets must subsequently be reported to FHWA by October 1, 2018. MPOs can either support the relevant state DOTs four- year target or establish their own by 180 days after the state DOT's target are established.

Bridges

State DOTs must establish targets for all bridges carrying the NHS, which includes on- and off-ramps connected to the NHS within a State, and bridges carrying the NHS that cross a State border, regardless of ownership. These must be statewide two and four- year targets by May 20, 2018, with subsequent reporting to FHWA by October 1, 2018. As with the pavement performance measures, MPOs can either support the relevant state DOT(s) four-year target or establish their own by 180 days after the State DOT's target are established.

Penalties

If FHWA determines that a state DOT's Interstate pavement condition falls below the minimum level for the most recent year, the state DOT must obligate a portion of National Highway Performance Program (NHPP) and transfer a portion of Surface Transportation Program (STP) funds to address Interstate pavement condition. If for three consecutive years more than 10.0% of a state DOT's NHS bridges' total deck area is classified as Structurally Deficient, the state DOT must obligate and set aside National Highway Performance Program (NHPP) funds for eligible projects on bridges on the NHS.

DISTRICT OF COLUMBIA

Tables 2 and 3 below are the established performance measures for both pavement and bridge conditions in the District of Columbia. Targets were established by use of historical data, future programmed projects, and future budgets appropriated to maintain pavement in a state of good repair. It should be noted that for the District of Columbia, it has a number of bridges that are not maintained by DDOT, but rather by the National Park Services (NPS). Regardless of this, those NPS bridges, i.e. The Memorial Bridge, are calculated into the overall bridge condition in the District Columbia.

Table 2: District of Columbia Summary of Pavement Condition Performance Measure Targets

Interstate	CY 2018 – 2020 Two Year Target	CY 2018 – 2022 Four Year Target
Percent Good	10%	5%
Percent Poor	5%	5%
NHS (Non-Interstate)	**CY 2018 – 2020 Two Year Target**	**CY 2018 – 2022 Four Year Target**
Percent Good	67%	54%
Percent Poor	7.1%	14.1%

Table 3: District of Columbia Summary of Bridge Condition Performance Measure Targets

Bridges	CY 2018 – 2020 Two Year Target	CY 2018 – 2022 Four Year Target
Deck Area Good	15.8%	24.9%
Deck Area Poor	8.6%	4.1%

MARYLAND

Tables 4 and 5 below are the established performance measures for both pavement and bridge conditions in the portion of Interstate and Non-Interstate roadways within the TPB planning area for the state of Maryland. Targets were established by use of historical data, future programmed projects, and future budgets appropriated to maintain pavement in a state of good repair.

Table 4: Maryland Summary of Pavement Condition Performance Measure Targets

Interstate	CY 2016 – 2018 Two Year Target	CY 2016 – 2020 Four Year Target
Percent Good	~~Not Required~~	62.8%
Percent Poor	~~Not Required~~	0.3%
NHS (Non-Interstate)	**CY 2016 – 2018 Two Year Target**	**CY 2016 – 2020 Four Year Target**
Percent Good	32.4%	31.6%
Percent Poor	6.5%	7.2%

Table 5: Maryland Summary of Bridge Condition Performance Measure Targets

Bridges	CY 2018 – 2019 Two Year Target	CY 2018 – 2021 Four Year Target
Deck Area Good	29.5%	27%
Deck Area Poor	2%	5%

VIRGINIA

Tables 6 and 7 below are the established performance measures for both pavement and bridge conditions for the state of Virginia. It was determined through coordination between TPB staff and Virginia DOT staff that determining a regional forecasted target, similar to the case in Maryland, was not feasible. Statewide targets were established by use of historical data, future programmed projects, and future budgets appropriated to maintain pavement in a state of good repair.

Table 6: Virginia Summary of Pavement Condition Performance Measure Targets

Interstate	CY 2018 – 2019 Two Year Target	CY 2018 – 2021 Four Year Target
Percent Good	45%	45%
Percent Poor	<3%	<3%
NHS (Non-Interstate)	**CY 2018 – 2019 Two Year Target**	**CY 2018 – 2021 Four Year Target**
Percent Good	25%	25%
Percent Poor	<5%	<5%

Table 7: Virginia Summary of Bridge Condition Performance Measure Targets

Bridges	CY 2018 – 2019 Two Year Target	CY 2018 – 2021 Four Year Target
Deck Area Good	33.5%	33%
Deck Area Poor	3.5%	3%

TPB Regional Pavement and Bridge Targets

Concerning the Pavement and Bridge Performance Measures, MPOs have two options. The first being to support the statewide targets established by the state DOTs. The second option is for the MPO to establish their own quantifiable four-year targets for both measures. In this case the TPB chose the latter option. The coordination for the establishment of these targets was highly dependent on the information provided by the states as well as information obtained from the Highway Performance Monitoring System (HPMS) and the National Bridge Inventory (NBI).

PAVEMENT

In deciding a forecasted four-year target for pavement condition for the TPB planning area, initially data was obtained and analyzed for the HPMS database using the field manual inventory, which contains metrics for rutting, faulting, cracking, and international roughness index (IRI). Next, TPB staff were able to calculate the number of lane miles within the planning area for the District of Columbia, Maryland, and Virginia. Table 8 gives the lane mileage for each state or part of the state, as well as the regional total number of lane miles in the TPB region. Finally, the statewide targets, for the District of Columbia and Virginia were applied to their respective lane miles within the TPB region. For the state of Maryland, forecasted targets for the portion of the state in the TPB planning area were provided and applied to the lane miles. Table 9 gives the regional pavement condition four-year target calculated by adding up the respective result for each state.

Table 8: Summary of Regional Lane Miles for Interstate and Non-Interstate Roadways

	Interstate Lane Miles	Non-Interstate Lane Miles
DC	55.2	464.4
MD*	853.6	2272.4
VA*	767.2	1897.4
Region	1676.0	4634.2

*Sub-Region

Table 9: Regional Performance Measure Targets for Pavement Condition

Interstate	CY 2018 – 2021 Four Year Target
(1) Percentage of pavements on the Interstate System in Good condition	52.7%
(2) Percentage of pavements on the Interstate System in Poor condition	1.7%
NHS (Non-Interstate)	**CY 2018 – 2021 Four Year Target**
(3) Percentage of pavements on the NHS (excl. Interstate) in Good condition	31.1%
(4) Percentage of pavements on the NHS (excl. Interstate) in Poor condition	7.0%

Graphical summaries of recent pavement condition performance and the four-year targets are provided in Figure 1 for the Interstate and in Figure 2 for the non-Interstate NHS.

Figure 1: Regional Interstate Performance Targets

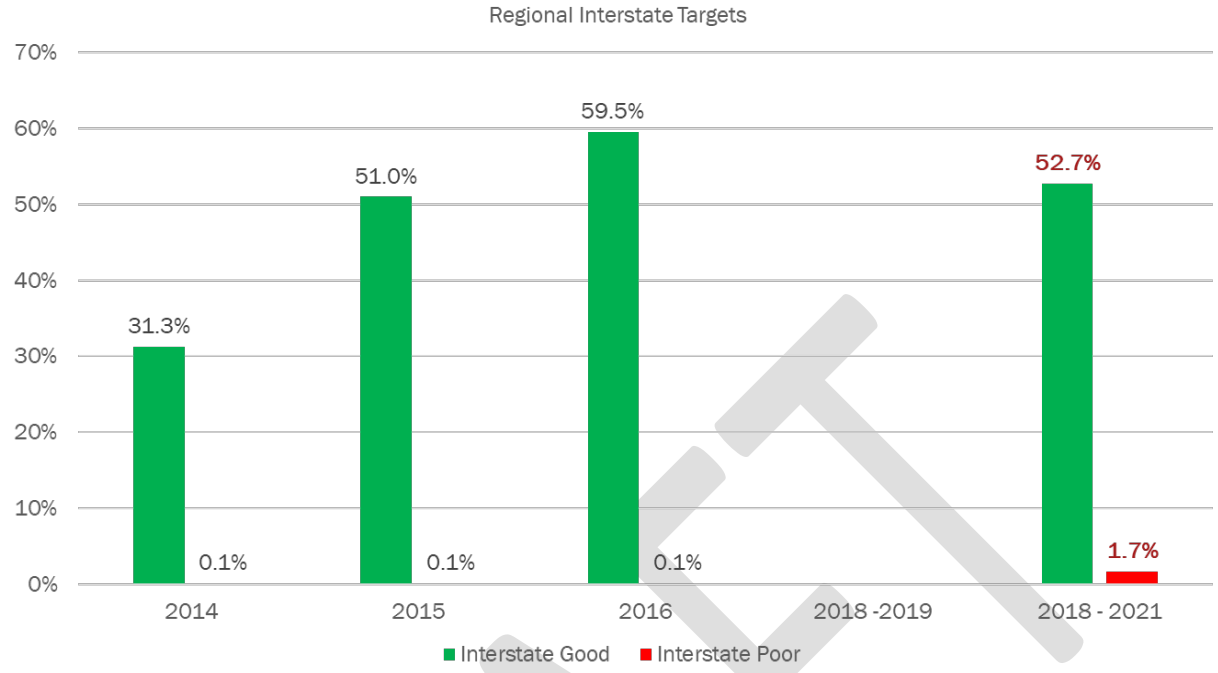
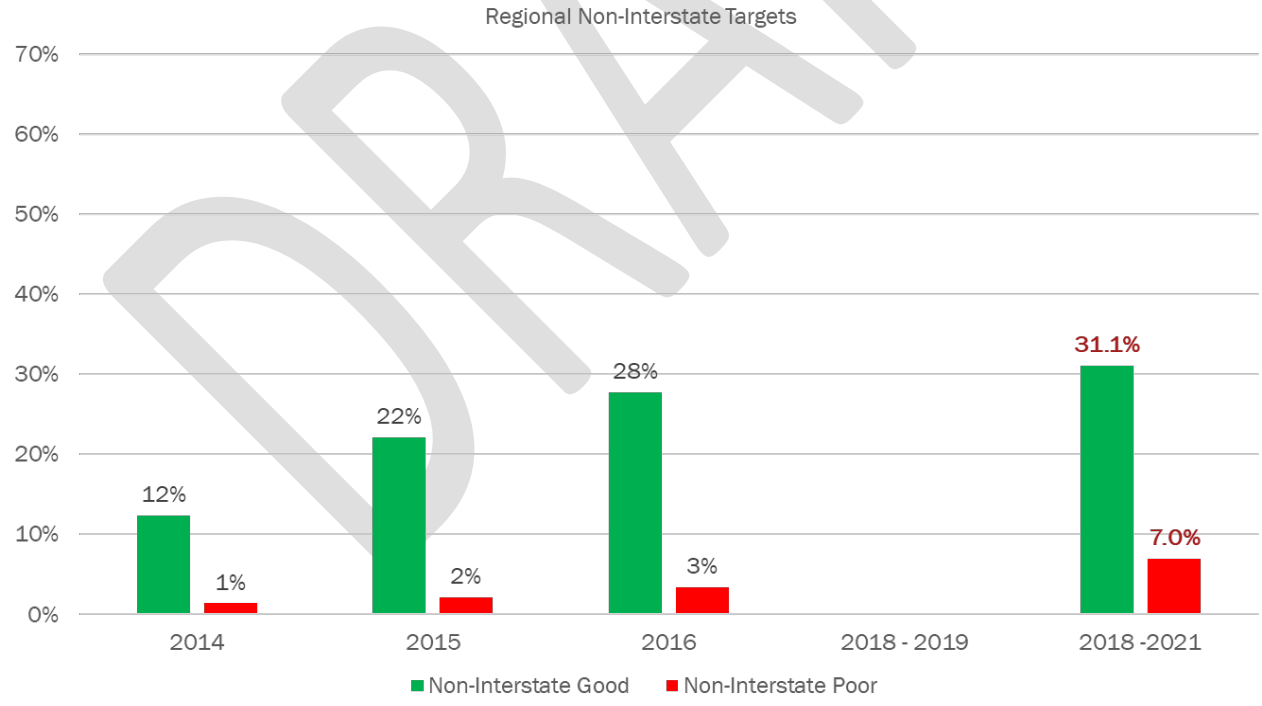


Figure 2: Regional Non-Interstate Performance Targets



BRIDGES

In terms of forecasting the four-year performance measure for the bridge condition within the TPB region, a similar methodology, to that of pavement, was also used. TPB staff collected data from the NBI, analyzing the condition of the surface area as the applicable metric. Next, the deck areas of bridges within the District of Columbia and the portions of Maryland and Virginia that are within the TPB planning area was calculated. Table 12 provides a breakdown of the surface areas of bridges within the TPB planning area. Finally, the statewide targets were applied to the respective deck areas and the four-year target for the region was calculated. The resulting targets are shown below in Table 13.

Table 12: Summary of Regional Deck Area for Bridges

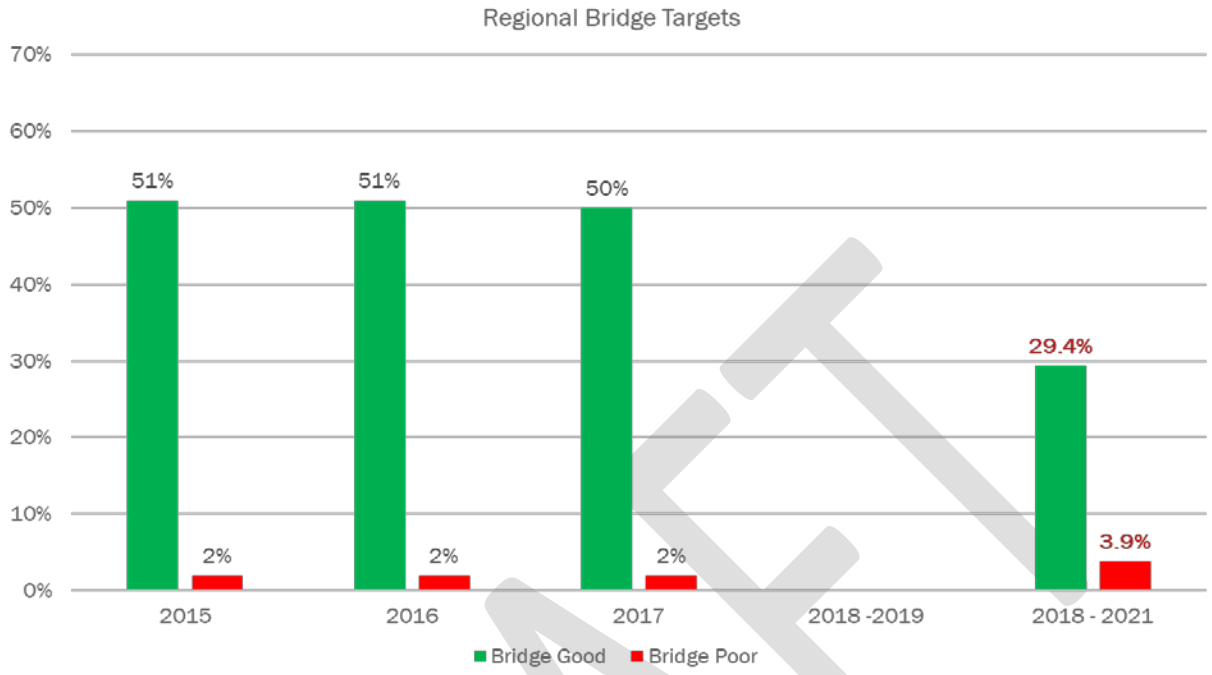
State	Deck Area (square feet)
DC	4,931,177
MD*	9,846,949
VA*	12,691,104
Region	27,469,229

Table 13: Regional Performance Measure Targets for Bridge Condition

Bridges	CY 2018 – 2021 Four-Year Target
(5) Percentage of NHS Bridges Classified as in Good Condition	29.4%
(6) Percentage of NHS Bridges Classified as in Poor Condition	3.9%

A graphical summary of recent performance and the four-year targets is provided in Figure 3.

Figure 3: Regional Bridge Performance Targets



PERFORMANCE BASED PLANNING & PROGRAMMING

National Highway System & Freight and Pavement & Bridge Performance Measures – Regional Targets

Eric Randall, TPB Engineer

Transportation Planning Board
July 18, 2018

Agenda Item 8

National Capital Region
Transportation Planning Board

Contents of Presentation

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  - Travel Time Reliability and Truck Travel Time Reliability Targets
- Pavement and Bridge Condition
  - Performance Measures
  - Pavement and Bridge Condition Targets
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National Highway System & Freight: Overview of Performance Measures

	Performance Measures
National Highway System	**Interstate Travel Time Reliability (TTR)** - Percent of person-miles traveled on the Interstate System that are reliable
	NHS (Non-Interstate) Travel Time Reliability (TTR) - Percent of person-miles traveled on the non-Interstate National Highway System (NHS) that are reliable

	Performance Measures
Freight Movement	**Freight Reliability (TTTR)** - Measurement of travel time reliability on the Interstate System using a Truck Travel Time Reliability (TTTR) Index.

Regional Highway System and Freight – Targets

- Request adoption of Resolution R1-2019 to set the following targets

	CY 2018 – 2021 Four Year Target
TTR – Interstate Percent of person-miles traveled on the Interstate System that are reliable	**58.5%**
TTR – Non-Interstate NHS Percent of person-miles traveled on the non-Interstate NHS that are reliable	**72.7%**
TTTR Index Ratio of the Interstate System Mileage providing for Reliable Truck Travel Times	**2.12**

Pavement and Bridge Condition Performance Measures

Performance Measures
(1) Percentage of pavements on the **Interstate** System in **Good** condition
(2) Percentage of pavements on the **Interstate** System in **Poor** condition
(3) Percentage of pavements on the **NHS** (excl. Interstate System) in **Good** condition
(4) Percentage of pavements on the **NHS** (excl. Interstate System) in **Poor** condition
(5) Percentage of **NHS Bridges** Classified as in **Good** Condition
(6) Percentage of **NHS Bridges** Classified as in **Poor** Condition

Regional Pavement & Bridge –Targets

- Request adoption of Resolution R2-2019 to set the following targets

Interstate Pavement	CY 2018 – 2021 Four Year Target
(1) Percentage of pavements on the **Interstate** System in **Good** condition	**52.7%**
(2) Percentage of pavements on the **Interstate** System in **Poor** condition	**1.7%**
NHS (Non-Interstate) Pavement	
(3) Percentage of pavements on the **NHS** (excl. Interstate) in **Good** condition	**31.1%**
(4) Percentage of pavements on the **NHS** (excl. Interstate) in **Poor** condition	**7.0%**
Bridges	
(5) Percentage of **NHS Bridges** Classified as in **Good** Condition	**29.4%**
(6) Percentage of **NHS Bridges** Classified as in **Poor** Condition	**3.9%**

Next Steps

- MPO provide all targets to state DOTs for inclusion in Baseline Period Performance reports to be submitted to FHWA by October 1, 2018
- Inclusion of targets in the System Performance report for Visualize 2045

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