PERFORMANCE BASED PLANNING & PROGRAMMING

2020 Update on Performance Targets

Eric Randall, TPB Engineer

TPB Technical Committee
June 5, 2020

National Capital Region
Transportation Planning Board

Contents of Presentation

- Review of PBPP Purpose and Target-Setting

- 2020 Update on PBPP Performance and Targets

  - Pavement and Bridge Condition

  - National Highway System & Freight

    - Travel Time Reliability

    - Truck Travel Time Reliability (Freight)

    - CMAQ Program Performance Measures:

      - Traffic Congestion: Peak Hour Excessive Delay, Traffic Congestion: Mode Share (non-SOV), On road Emissions Reduction

Performance Based Planning and Programming

- Under MAP-21 and reinforced in the FAST Act, federal surface transportation regulations require the implementation of performance based planning and programming (PBPP) by State DOTs, MPOs, and providers of public transportation

    "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."

- State DOTs, MPOs, and providers of public transportation must link investment priorities to the achievement of performance targets (included in TIP and long-range plan)

Federal PBPP Performance Areas

- Federal PBPP process requires State DOTs, MPOs and providers of public transportation to set targets (annually or every two/four years) for 26 performance measures
  - Highway Safety
  - Highway Assets (Pavement and Bridge Condition)
  - Highway System Performance (Reliability, Freight, CMAQ Program)
  - Transit Assets
  - Transit Safety

TPB Measures and Targets

| Performance Area	Measure	Metric	Adopted Targets as of February 19, 2020
Highway Safety	Five-Year Rolling Average	# of Fatalities	253.0
	Five-Year Rolling Average	Rate of Fatalities	0.588
	Five-Year Rolling Average	# of Serious Injuries	2692.1
	Five-Year Rolling Average	Rate of Serious Injuries	6.157
	Five-Year Rolling Average	# of Non-Motorized Fatalities and Serious Injuries	508.6
Highway Asset Condition	Percent Pavement Lane Miles Interstate / NHS (excl. Interstate)	In Good Condition	52.7% / 31.1%
	Percent Pavement Lane Miles Interstate / NHS (excl. Interstate)	In Poor Condition	1.7% / 7.0%
	Percent Bridge Deck Area	In Good Condition	29.4%
	Percent Bridge Deck Area	In Poor Condition	3.9%
Highway Reliability	Percent Person Miles Traveled Interstate / NHS (excl. Interstate)	Level of Travel Time Reliability	58.5% / 72.7%
Freight	Index	Truck Travel Time Reliability	2.12
Congestion	Annual Hours per Capita	Peak Hour Excessive Delay	26.7
	Percentage	Non-SOV Travel	37.2%
Vehicular Emissions	Total Emissions Reduction (kg/day)	VOCs / NOx	2.195 / 4.703
Transit Asset Management	Percentage	Service Vehicles exceeding Useful Life	5.0% (Bus)
	Percentage	Revenue Vehicles exceeding Useful Life	16.6% (Truck)
	Percentage	Track Segments with Performance Restrictions	3.8% (Heavy Rail)
	Percentage	Facilities rated Marginal or Poor	6.3% (Pass. Facilities)

National Capital Region
Transportation Planning Board

Pavement Condition – Adopted Targets

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%**

- The pavement targets for the state DOTs are based primarily on an assessment of future budget allocations for maintaining a state of good repair

- Regional targets were developed by taking the state DOT targets and applying them to the lane miles in the TPB planning area for each state

National Capital Region
Transportation Planning Board

Pavement (Interstate): Recent Data and 4-Year Targets
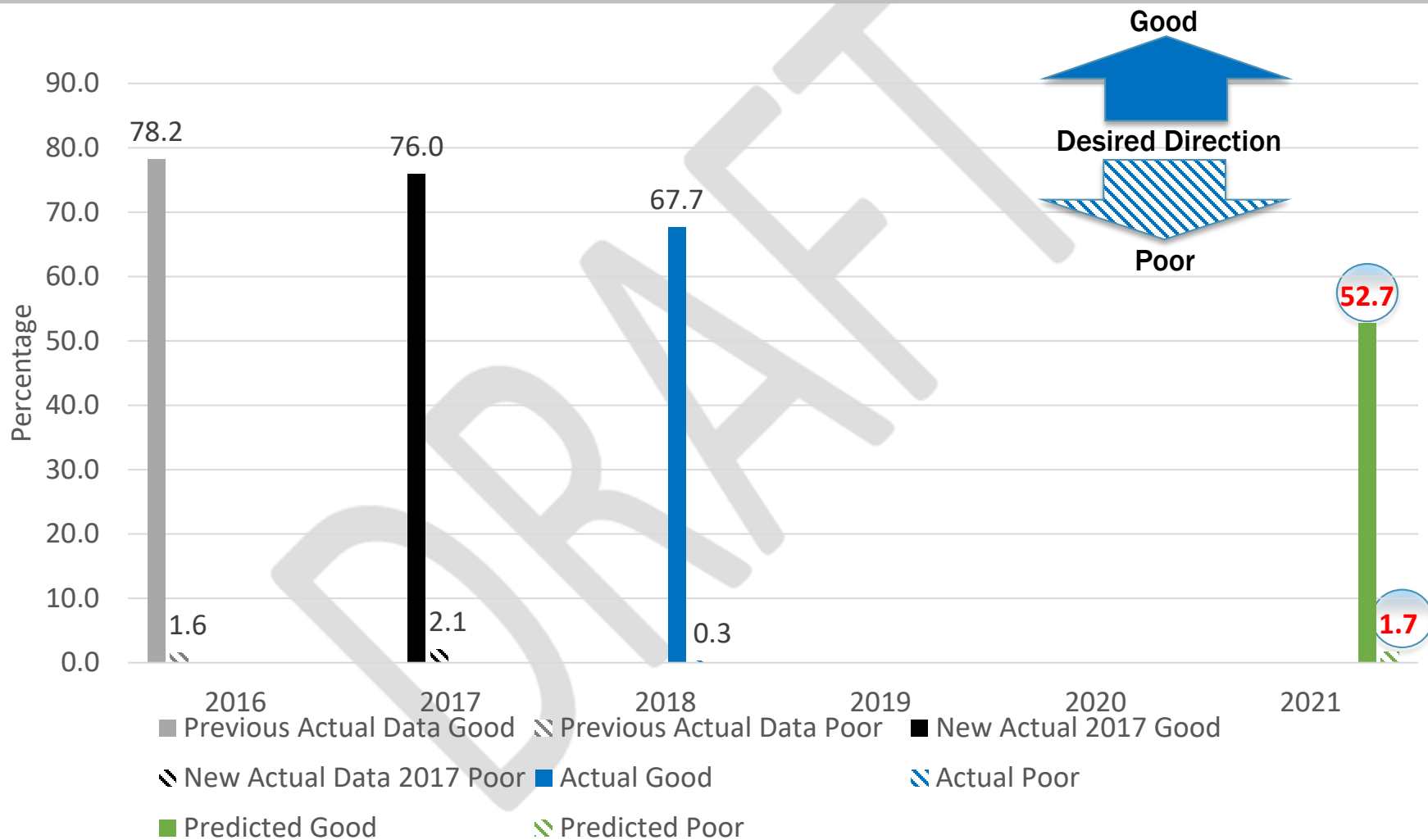
Pavement (Non-Interstate NHS): Recent Data and 4-Year Targets
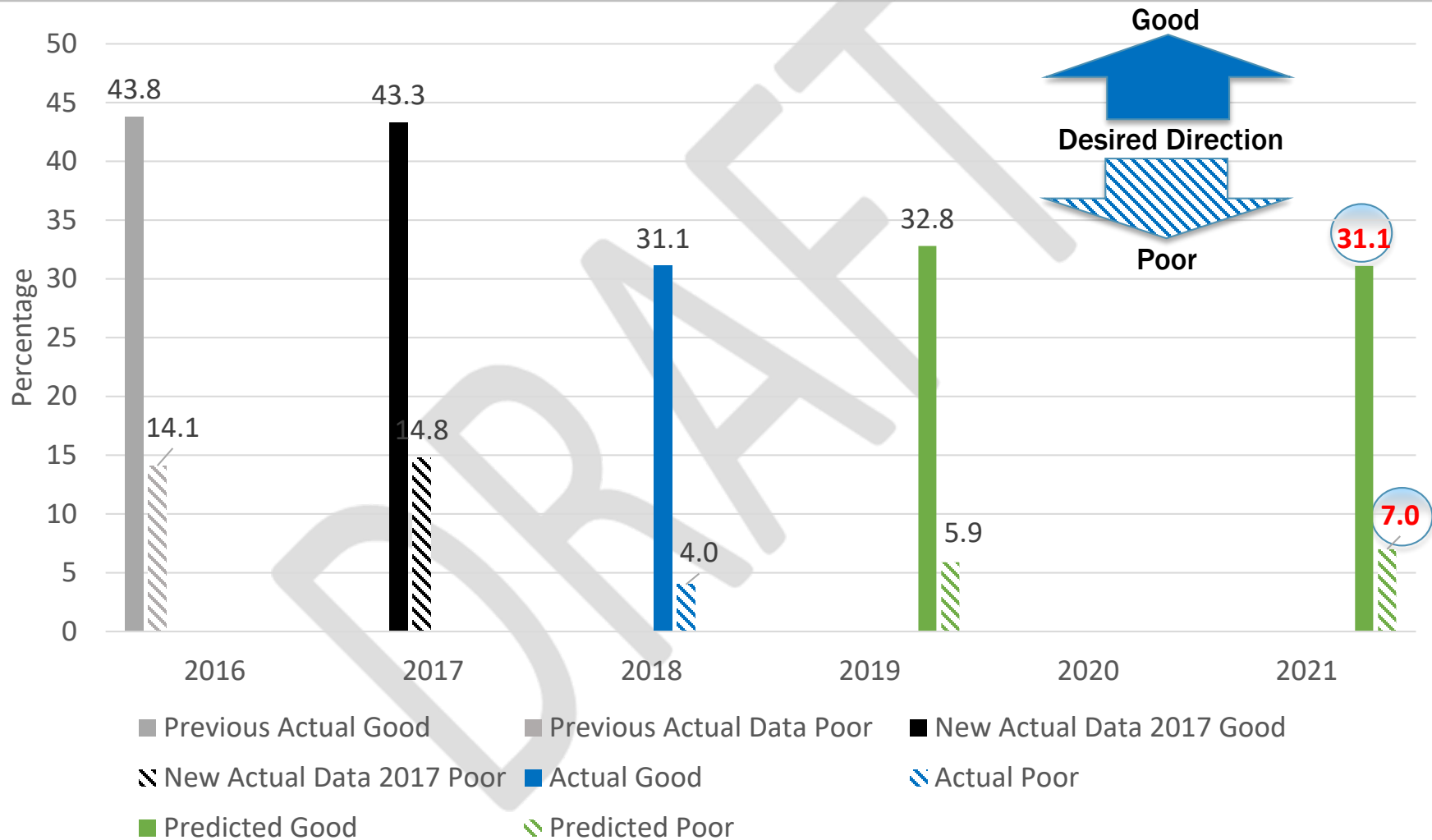
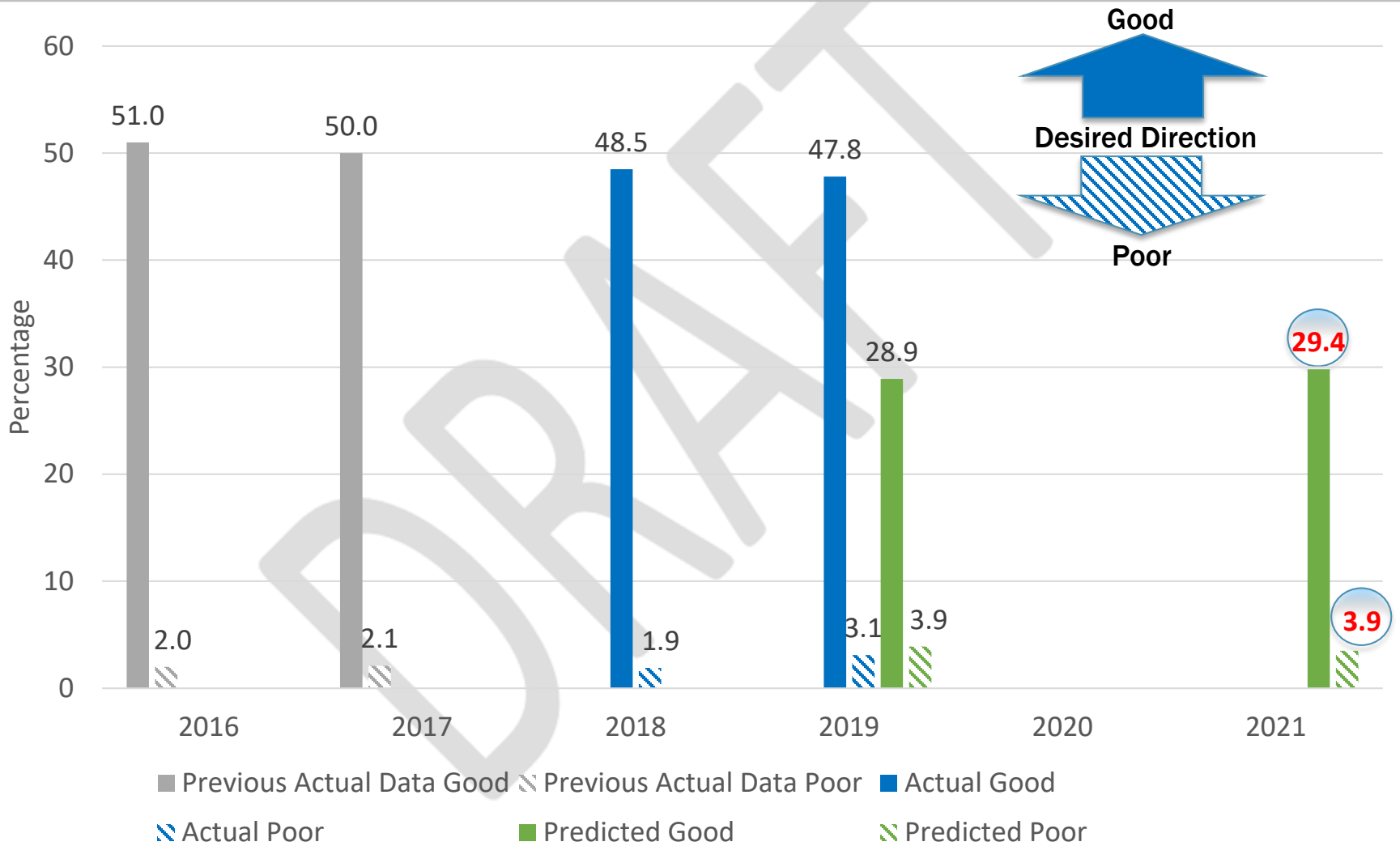# Regional Bridges – Adopted Targets

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%**

- The bridge targets for the state DOTs are based primarily on an assessment of future budget allocations for maintaining a state of good repair

- Regional targets were developed by taking the state DOT targets and applying them to the bridge deck area in the TPB planning area for each state

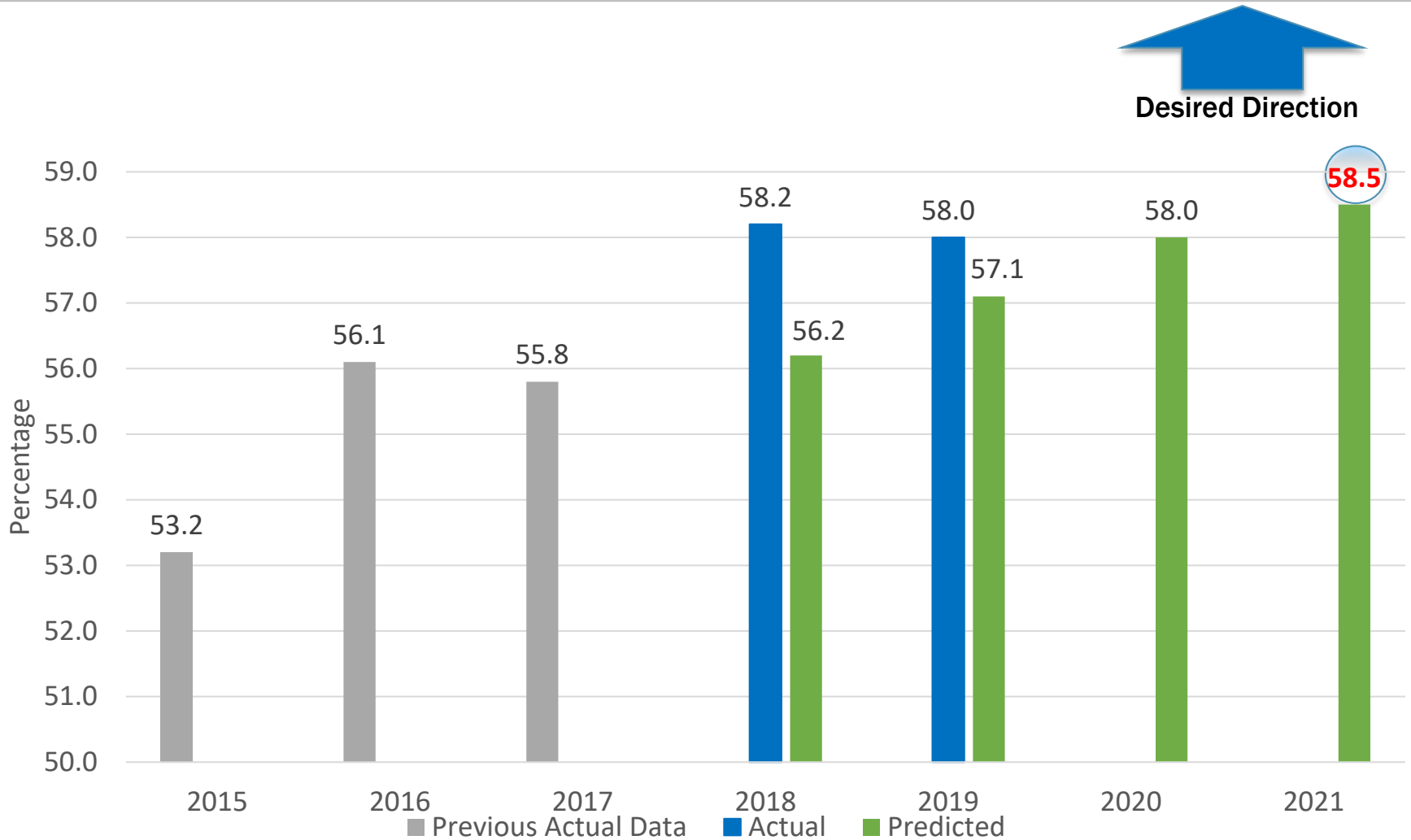# Bridge Condition: Recent Data and 4-Year Targets

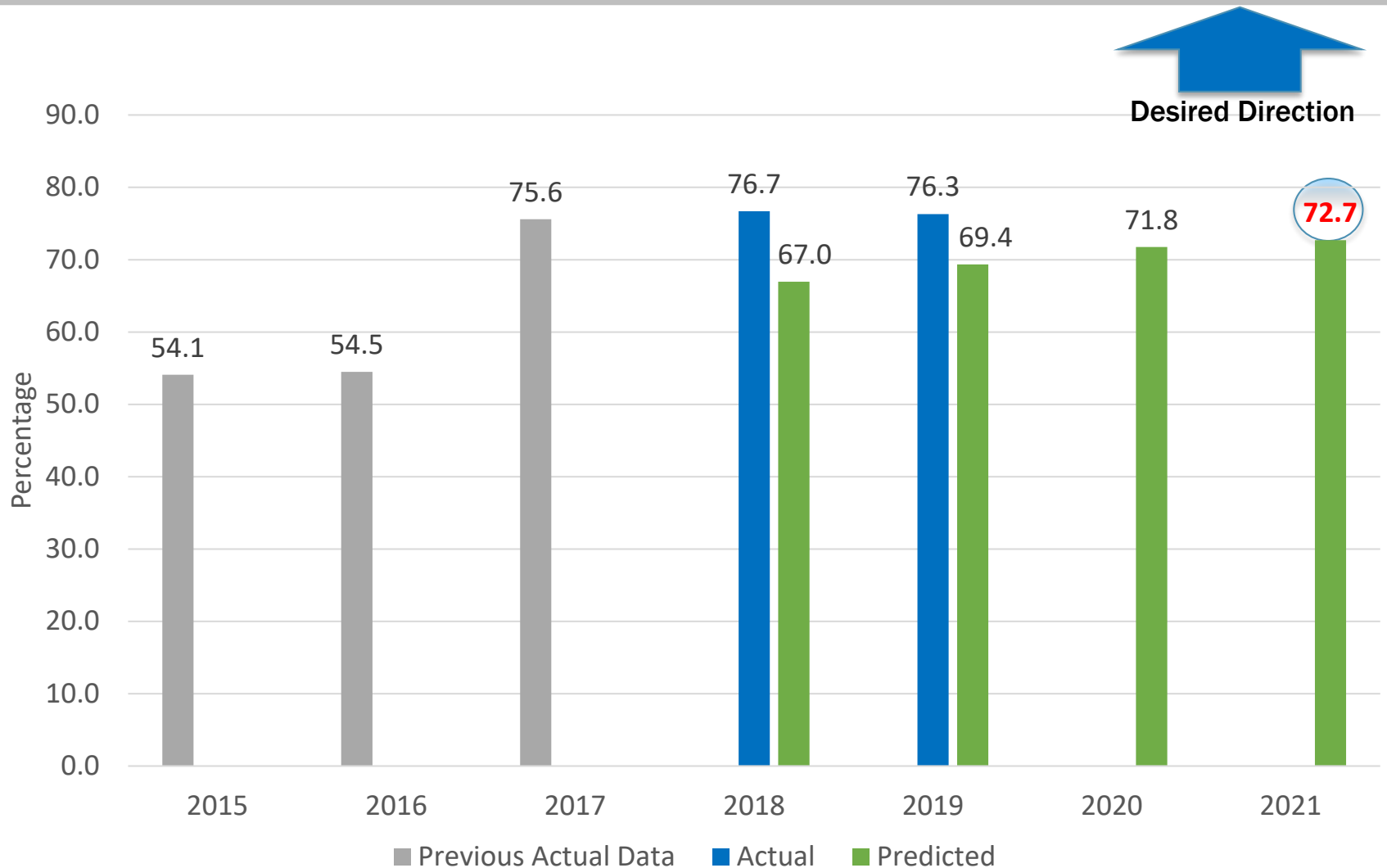# Regional Highway System and Freight – Adopted Targets

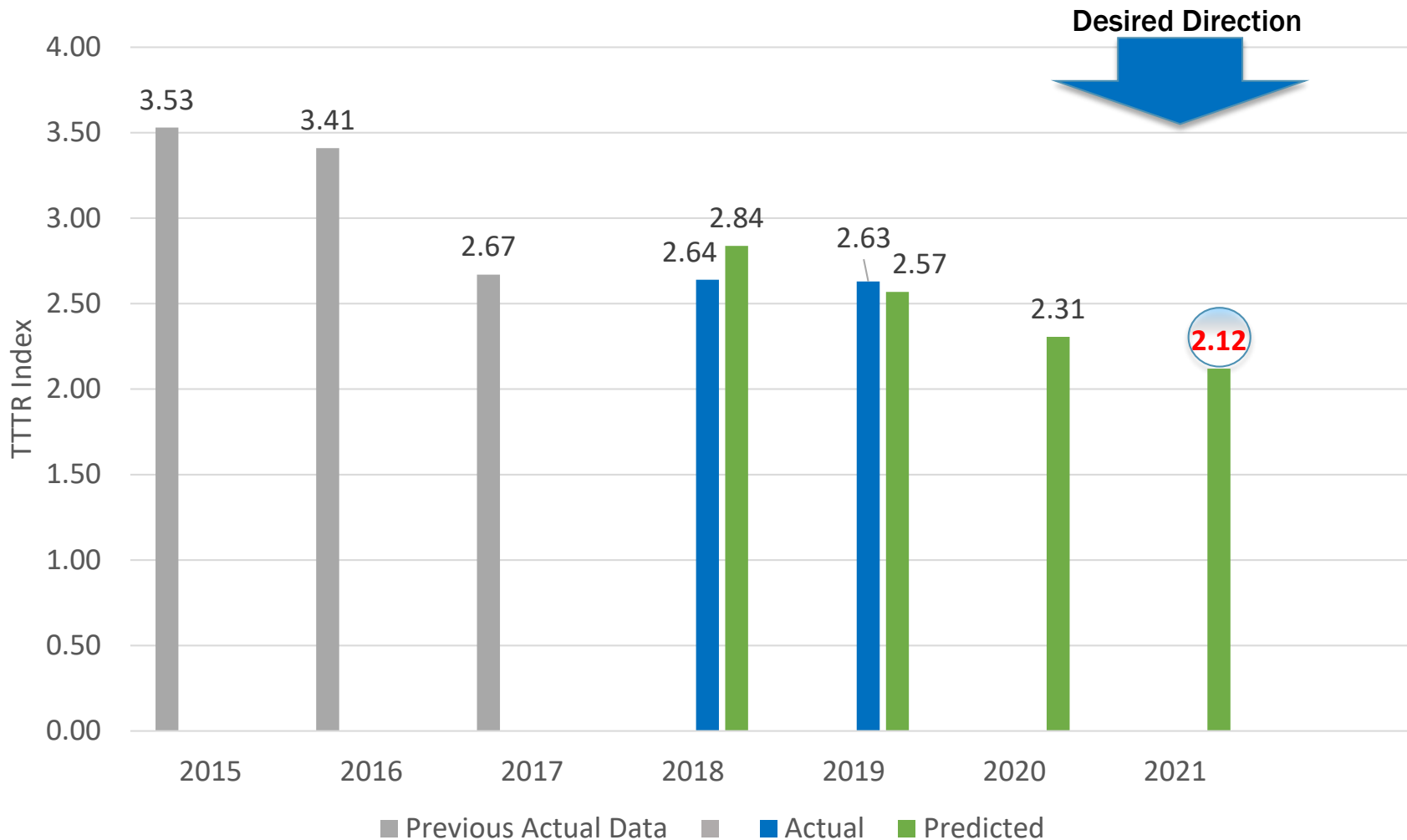|	CY 2018 – 2021 Four Year Target
TTR – Interstate Percent of person-miles traveled on the Interstate System that are reliable	**58.5%**
TTR – Non-Interstate NHS Percent of person-miles traveled on the non-Interstate NHS that are reliable	**72.7%**
TTTR Index Ratio of the Interstate System Mileage providing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

TTR (Interstate): Recent Data and 4-Year Targets

Desired Direction

Chart showing Percentage (y-axis, 50.0 to 59.0) by year (x-axis, 2015–2021):

- 2015: 53.2 (Previous Actual Data)
- 2016: 56.1 (Previous Actual Data)
- 2017: 55.8 (Previous Actual Data)
- 2018: 58.2 (Actual), 56.2 (Predicted)
- 2019: 58.0 (Actual), 57.1 (Predicted)
- 2020: 58.0 (Predicted)
- 2021: 58.5 (Predicted)

Legend: Previous Actual Data | Actual | Predicted

National Capital Region
Transportation Planning Board

TTR (Non-Interstate): Recent Data and 4-Year Targets

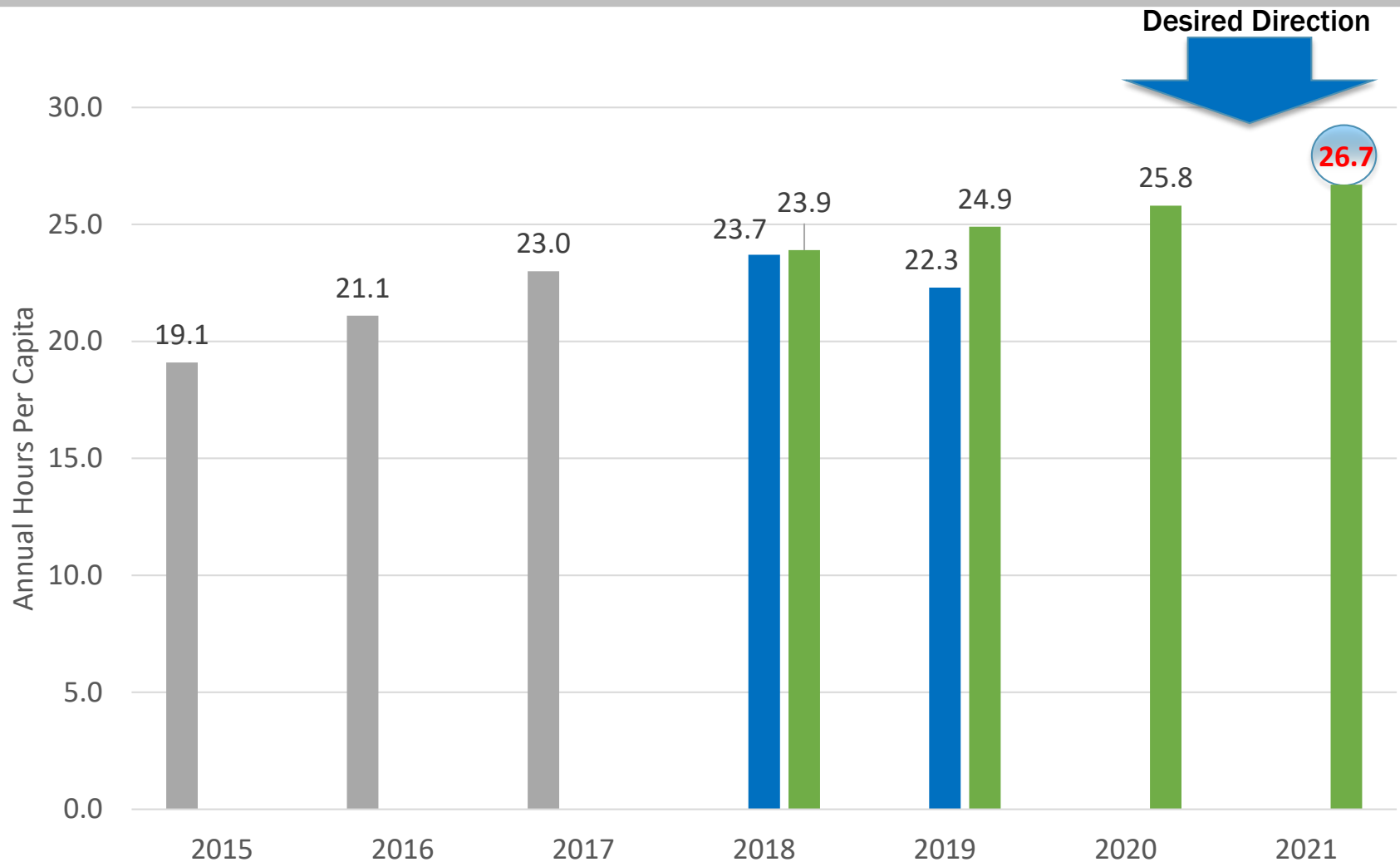# Truck TTR Index: Recent Data and 4-Year Targets

CMAQ Program - Adopted Targets

Performance Measures for the Washington DC-MD-VA urbanized area	CY 2018 – 2019 Two Year Target	CY 2018 – 2021 Four Year Target
Peak Hour Excessive Delay (PHED)	Not Required	26.7 Hours**
Mode Share (Non-SOV)	36.9%	37.2%

Total Emissions Reductions for the TPB portion of the Washington DC-MD-VA nonattainment area		FFY 2018 – 2019 Two Year Target	FFY 2018 – 2021 Four Year Target
	Volatile Organic Compounds (VOCs)	1.8376 Kg/Day	2.1950 Kg/Day
	Nitrogen Oxides (NOx)	4.0194 Kg/Day	4.7026 Kg/Day

National Capital Region
Transportation Planning Board

Traffic Congestion: PHED - Recent Data and 4-Year Targets

Desired Direction

Chart: Annual Hours Per Capita by year

- 2015: 19.1 (Previous Actual Data)
- 2016: 21.1 (Previous Actual Data)
- 2017: 23.0 (Previous Actual Data)
- 2018: 23.7 (Actual), 23.9 (Predicted)
- 2019: 22.3 (Actual), 24.9 (Predicted)
- 2020: 25.8 (Predicted)
- 2021: 26.7 (Predicted)

Legend:
- Previous Actual Data
- Actual
- Predicted

National Capital Region
Transportation Planning Board

Traffic Congestion: Mode Share–Recent Data and 2-Year and 4-Year Targets
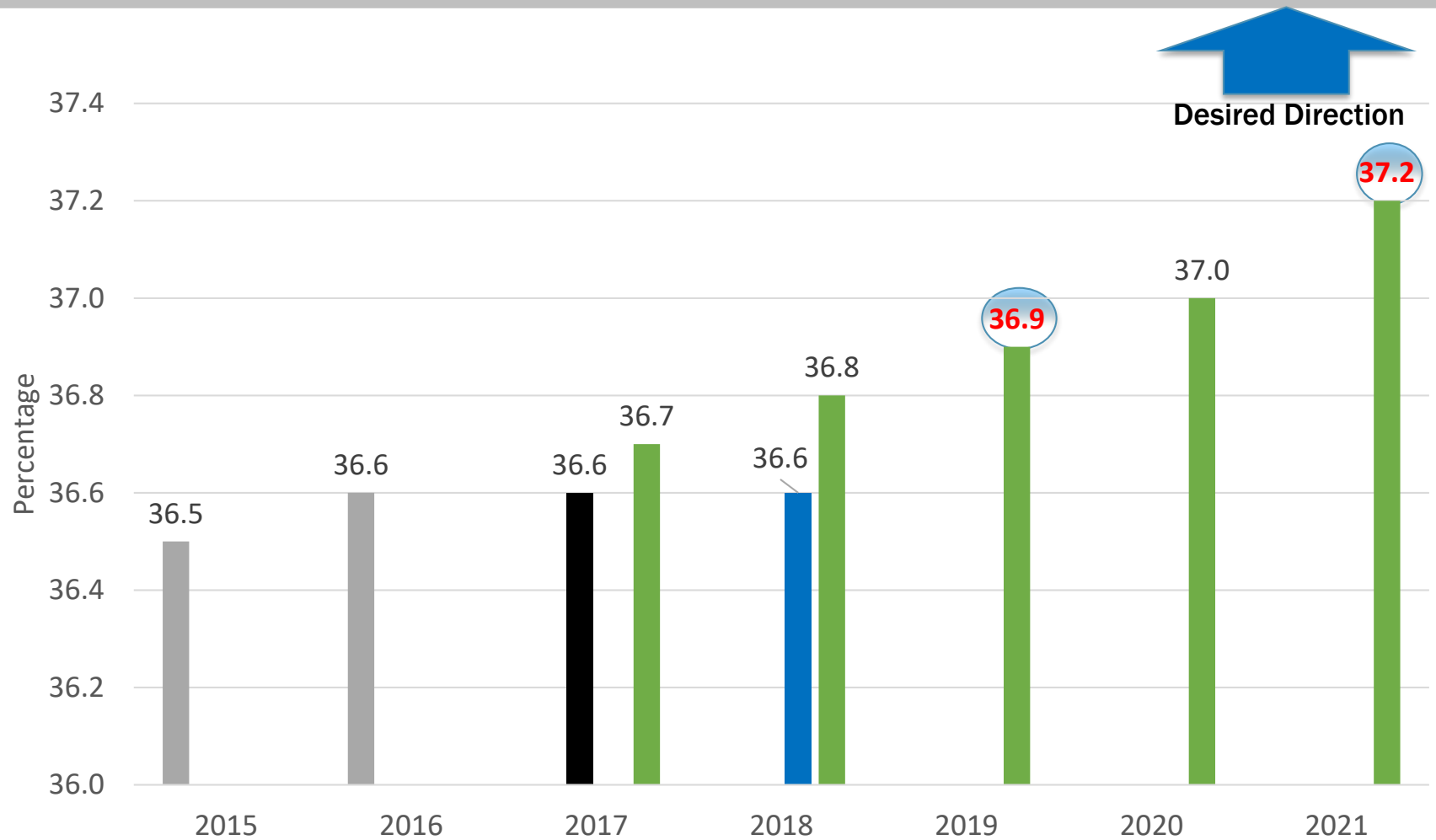
Emissions Reduction (VOC): Recent Data and 2-Year and 4-Year Targets

Kilograms of Emissions Reduced Per Day

Desired Direction

- 0.072 (2015)
- 3.672 (2016)
- 2.532 (2017)
- 29.134, 1.838 (2018-2019)
- 2.195 (2018-2021)

Legend:
- Previous Actual Data
- New Actual Data 2017
- Actual
- 2018-2019 Predicted
- 2018-2021 Predicted
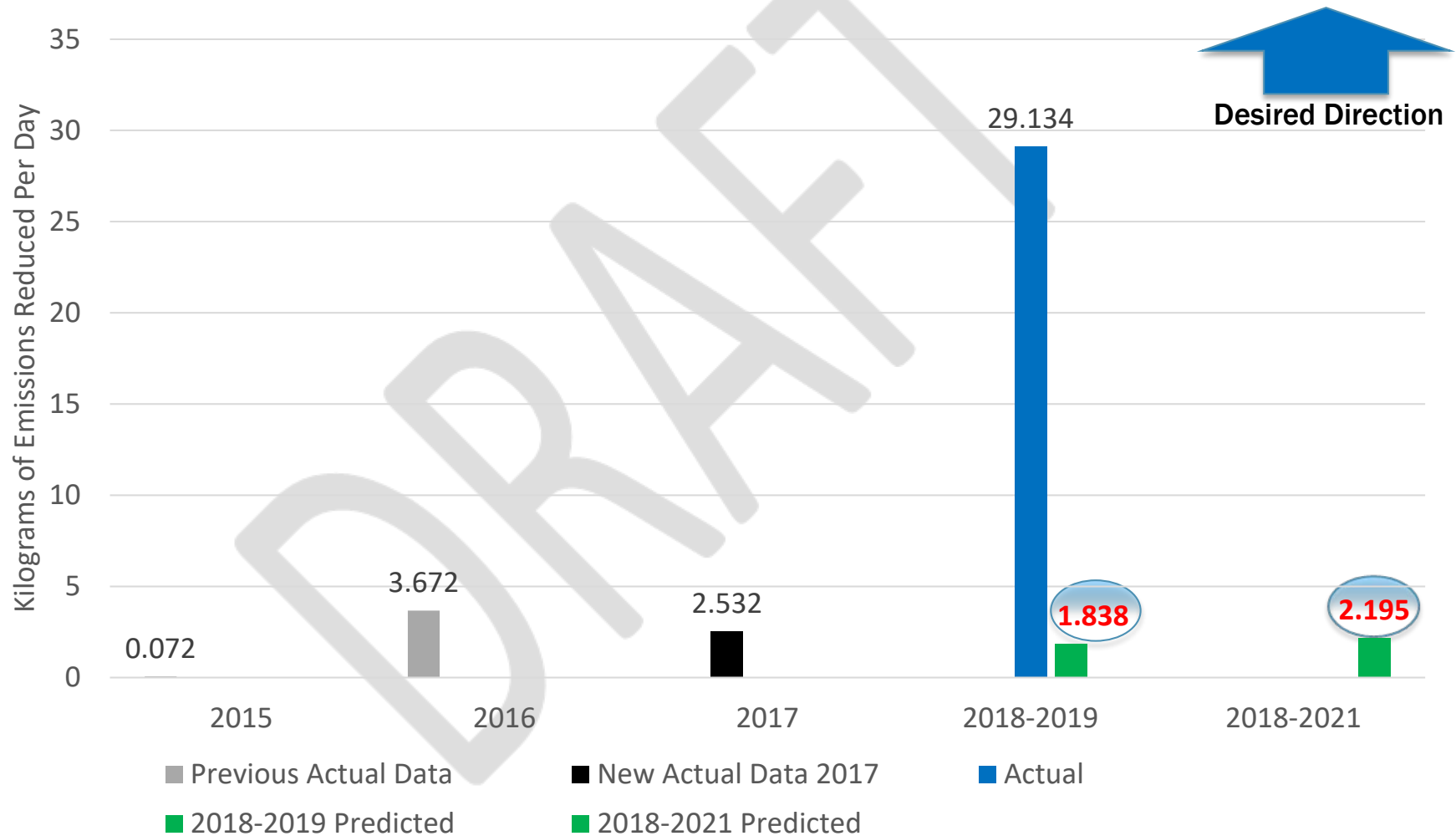
Emissions Reduction (NOx): Recent Data and 2-Year and 4-Year Targets

Chart: Kilograms of Emissions Reduced Per Day

- 2015: 0.816 (Previous Actual Data)
- 2016: 5.956 (Previous Actual Data)
- 2017: 4.074 (New Actual Data 2017)
- 2018-2019: 144.156 (Actual); 4.019 (2018-2019 Predicted)
- 2018-2021: 4.703 (2018-2021 Predicted)

Desired Direction

Legend:
- Previous Actual Data
- New Actual Data 2017
- Actual
- 2018-2019 Predicted
- 2018-2021 Predicted

National Capital Region
Transportation Planning Board

Next Steps: TPB

- Confirm recent actual performance data
- Share progress against targets with State DOTs and adjoining MPOs
  - Consider revision of 4-Year targets for Pavement and Bridge Condition and Highway System Performance (TTR, TTTR, CMAQ) in coordination and consultation with the State DOTs
- Complete the MPO CMAQ Performance Plan with MPO progress towards targets and submit to State DOTs by September 2020

Eric Randall

TPB Engineer

(202) 962-3254

erandall@mwcog.org

mwcog.org/tpb

Metropolitan Washington Council of Governments

777 North Capitol Street NE, Suite 300

Washington, DC 20002

National Capital Region
Transportation Planning Board

Highway Condition Performance Measures

Performance Measure	Data
(1) Percentage of pavements on the **Interstate** System in **Good** condition	*four metrics:* • IRI (International Roughness Index) • Cracking_Percent • Rutting (*asphalt only*) • Faulting (*jointed concrete only*) *three types of pavements:* • Asphalt pavements • Continuously Reinforced Concrete Pavement (CRCP) • Jointed Concrete Pavements
(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	*four condition ratings:* • Deck • Superstructure • Substructure • Culverts
(6) Percentage of **NHS Bridges** Classified as in **Poor** Condition	

Pavement and Bridge – Target Requirements

- Pavement: measurement of the condition (**good** or **poor**) of pavement on both the Interstate and Non-Interstate roadways on the NHS

  - For Pavement, State DOTs established **two** and **four-year targets** (2019 and 2021 respectively) for the NHS (Non-Interstate) roadways, but only a **four-year target** for the Interstate NHS, by May 20, 2018

- Bridge: Measurement of the bridge deck area condition (**good** or **poor**) for all bridges on the NHS

  - For Bridges, State DOTs established **two** and **four-year targets** for the bridge deck condition by May 20, 2018

- MPOs must either support the State targets or establish their own quantifiable **four-year targets** within 180 days

- All Pavement and Bridge targets will be reported in the states' baseline performance period reports due to FHWA by October 1, 2018

Pavement and Bridge Measures – Data

- Pavement: data is reported annually by State DOTs into the Highway Performance Monitoring System (HPMS)

- Bridge: data is reported annually by State DOTs into the National Bridge Inventory (NBI)

- TPB staff accessed this data to determine performance for the region for the pavement and bridge performance measures

- A map site for the pavement and bridge conditions has been developed: https://gis.mwcog.org/webmaps/tpb/pbpp/pavement_bridge/

Travel Time Reliability (TTR) & Truck Travel Time Reliability (TTTR) Data

- Data is collected through the National Performance Management Research Data Set (NPMRDS)
  - Procured and sponsored by the Federal Highway Administration (FHWA), this is the designated source for TTR/TTTR data
  - It is an archived speed and travel time data set (including associated location data) covering the National Highway System (NHS)
  - Data available at 5 minute intervals for Passenger vehicles, Trucks, and Trucks and Passenger vehicles combined

- Travel Time Reliability (TTR): the percent of person-miles for which the ratio of a longer travel time (80th percentile) to a "normal" travel time (50th percentile) is < 1.5 for the reporting segment

- Truck Travel Time Reliability (TTTR) Index: the ratio of a longer travel times (95th percentile) to a "normal" travel time (50th percentile)

TTR & TTTR Data Collection

- Data was collected using NPRDMS and MAP-21 widgets created by RITIS for the TPB metropolitan planning area

- A set of Dashboard widgets to help set targets, understand baseline conditions, and assess progress toward achieving the goals associated with the measures

- Available currently:

  - Interstate Travel time reliability (TTR)

  - Non-interstate NHS TTR

  - Truck TTR Index

  - Annual Hours of Peak Hour Excessive Delay (PHED) Per Capita

National Capital Region
Transportation Planning Board

NPMRDS: RITIS MAP-21 Widget

TTR and TTTR targets developed by Averaging Extrapolated Trends and TDM Indicator

National Capital Region
Transportation Planning Board
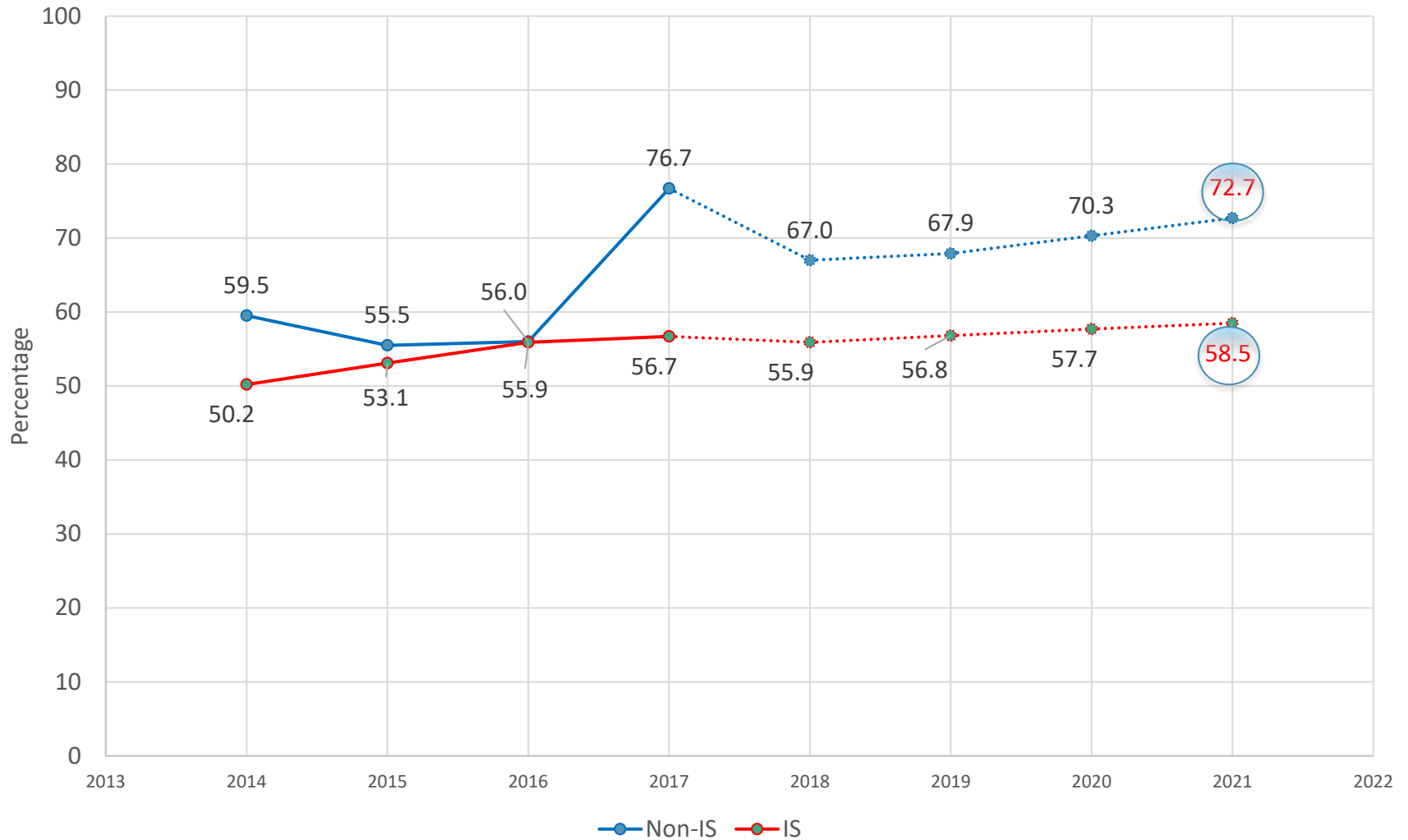
System Performance: CMAQ Program (Congestion Mitigation and Air Quality)

	Performance Measures
CMAQ Program: Traffic Congestion	**Peak Hour Excessive Delay (PHED)** – Annual hours of peak hour excessive delay per capita
	Mode Share - Percent of Non-SOV Travel on the National Highway System (NHS)
CMAQ Program: Emissions Reduction	**Emissions** - CMAQ-funded projects on-road mobile source total emission reductions for each applicable criteria pollutant and precursor

National Capital Region
Transportation Planning Board

Traffic Congestion: Peak Hour Excessive Delay Overview

The Peak Hour Excessive Delay (PHED) measure is the <u>per capita</u> excessive delay on all reported segments on the National Highway System in the urbanized area

- Excessive delay = when travel speed is less than 20 miles per hour or 60% of the posted speed limit

PHED is calculated by measuring [1] or forecasting:
- cumulative hours of excessive delay experienced by all people,
- travelling through all reported segments on the NHS in the urbanized area,
- during the peak period [2] *(even though titled Peak Hour),*
- for the full calendar year.

1. TPB urbanized area Peak travel hours:
   Weekday morning: 6 a.m. to 10 a.m. And Weekday afternoon: 3 p.m. to 7 p.m.
2. Current year data collected using the National Performance Management Research Data Set (NPMRDS)

National Capital Region
Transportation Planning Board

Traffic Congestion: Mode Share Overview

- Non-SOV (Single Occupancy Vehicle) mode share measure is for the commuting travel within the urbanized area.

- Includes carpools/vanpools, public transit, walking, biking, and teleworking.

- Non-SOV mode share data derived from the U.S. Census Bureau American Community Survey

National Capital Region
Transportation Planning Board

On-road Emissions Reduction - Overview

- Applies to criteria pollutants in non-attainment or maintenance areas*

- Emissions reductions data are estimates from (select) projects that have received CMAQ funds

- Forecast emissions reductions are estimates based on projects anticipated to receive CMAQ funds

- TPB targets reflect the anticipated cumulative emissions reduction to be reported by MDOT, VDOT, and DDOT for the region

* Targets for Calvert County will be set by Calvert-St Mary's MPO (outside TPB planning area) .

EXHIBIT 1
TPB Transportation Planning Areas

Legend:
— TPB Model Area
▨ TPB Planning Area
▪▪▪▪ 8-Hour Ozone Nonattainment Area