

CHAPTER 6

PERFORMANCE PLANNING

The TPB has championed improvements in the ways the region's transportation system is managed and operated. This chapter describes the purpose of performance planning, highlighting the Performance-Based Planning and Programming (PBPP) federal requirements and significance. The Congestion Management Process (CMP), a systematic process that provides for safe and effective management and operation of the transportation system, is discussed. Then, other TPB planning efforts focused on safety and its importance throughout the transportation planning process are also described.



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Performance-Based Planning and Programming

Performance-based planning and programming (PBPP) is a new process requiring states and MPOs to “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.”¹ In coordination with partners, the TPB is tasked with setting targets for 25 performance measures. As PBPP progresses over the years, performance compared to the targets will help inform funding decisions and help achieve targets. More information about the TPB's PBPP efforts can be found in [Appendix D: PBPP System Performance Report](#) and at mwcog.org/PBPP.

The TPB, states, and providers of public transportation use the PBPP process in the following areas:

- Highway Safety;
- Highway Assets;
- Highway System Performance;
- Vehicular Emissions;
- Transit Asset Management; and
- Transit Safety.

¹ Federal Register, Vol. 81, No. 103, Friday, May 27, 2016, page 34051, Section B.1.

Figure 6.1 Breakdown of the Six PBPP Areas and Measures

PERFORMANCE AREA	MEASURE	METRIC
Highway Safety	5-Year Rolling Average	<ul style="list-style-type: none"> • # of Fatalities • Rate of Fatalities • # of Serious Injuries • Rate of Serious Injuries • # of Non-Motorized Fatalities and Serious Injuries
Highway Asset Management	Percent of Pavement Lane Miles*	<ul style="list-style-type: none"> • In Good Condition • In Poor Condition
	Percent of Bridge Deck Area	<ul style="list-style-type: none"> • In Good Condition • In Poor Condition
Performance of National Highway System	Percent of Person Miles Traveled ¹	Level of Travel Time Reliability
Freight Movement Reliability	Index	Truck Travel Time Reliability
Roadway Congestion	Annual Hours Per Capita	Peak Hour Excessive Delay
	Percent of	Non-Single Occupancy Vehicle Travel
Vehicular Emissions	Total Emissions Reduction	Volatile Organic Compounds and Nitrogen Oxides
Transit Asset Management	Percent of	<ul style="list-style-type: none"> • Service Vehicles exceeding Useful Life • Revenue Vehicles exceeding Useful Life • Track Segments with Performance Restrictions • Facilities rated Marginal or Poor
Transit Safety	Number and Rate (per Revenue Vehicle Mile)	<ul style="list-style-type: none"> • Fatalities by Mode • Reportable Injuries by Mode • Reportable Safety Events by Mode
	Mean Distance	Between Major Mechanical Failures by Mode

* Measures calculated separately for the Interstate and for the National Highway System (excluding Interstate).



Performance Measures and Targets

For each of the six areas, the TPB is responsible for determining how to calculate measures and set targets for the metropolitan planning area (see Figure 6.1 for all the categories and measures). The TPB's efforts overlap with state-level transportation agencies and public providers of transportation who are also responsible for calculating measures and setting targets at the state level or for the transit system. As a result, the TPB coordinates with the states and transit agencies in establishing measures and targets for the region. This ensures consistency in the methods used to calculate measures and adequately reflects the various factors considered. The following sections describe the processes of developing the targets and share the targets which have been set by the TPB.



Highway Safety

Figure 6.2 lists the five specific federally-prescribed highway safety measures for which the TPB is required to establish targets. The targets are established for one year into the future and are updated at the end of the target year. Once the targets are established, the TPB must collect data and report to the state DOTs the performance outcomes for each measure annually and include the results in the long-range transportation plan. The results of this monitoring effort are intended to inform future funding decisions on projects and programs that affect highway safety. The monitoring results are also intended to inform the next update of the target.

In January 2018 the TPB adopted the targets displayed in Figure 6.2 for each of the five measures. In 2019, when data becomes available, the targets will be compared to actual performance (using a five-year rolling average) to determine if targets were achieved.² The TPB will also update these targets for the year 2019.

REGIONAL HIGHWAY SAFETY TARGET SETTING APPROACH

The TPB's planning area, for which performance targets are to be established, lies within three different jurisdictions: the District of Columbia, Maryland, and Virginia. As such, regional highway safety targets were determined by identifying sub-targets for the District of Columbia, Maryland, and Virginia portions of the region and applying each state's target setting approach to their respective portion of the region. Targets for the region were developed by mathematically combining the three sub-targets into an overall target for the region (see Figure 6.2).

Figure 6.2 - 2018 Regional Highway Safety Targets (Five Year Rolling Average)

	2018 Target
Number of fatalities	253
Rate of fatalities per 100 million vehicle miles of travel	0.59
Number of serious injuries	3,007
Rate of serious injuries per 100 million vehicle miles of travel	6.79
Number of nonmotorist fatalities and serious injuries	529

² As required by federal rule, annual safety targets are expressed as five-year rolling averages. Additional detail: [gpo.gov/fdsys/pkg/FR-2016-03-15/pdf/2016-05202.pdf](https://www.gpo.gov/fdsys/pkg/FR-2016-03-15/pdf/2016-05202.pdf).

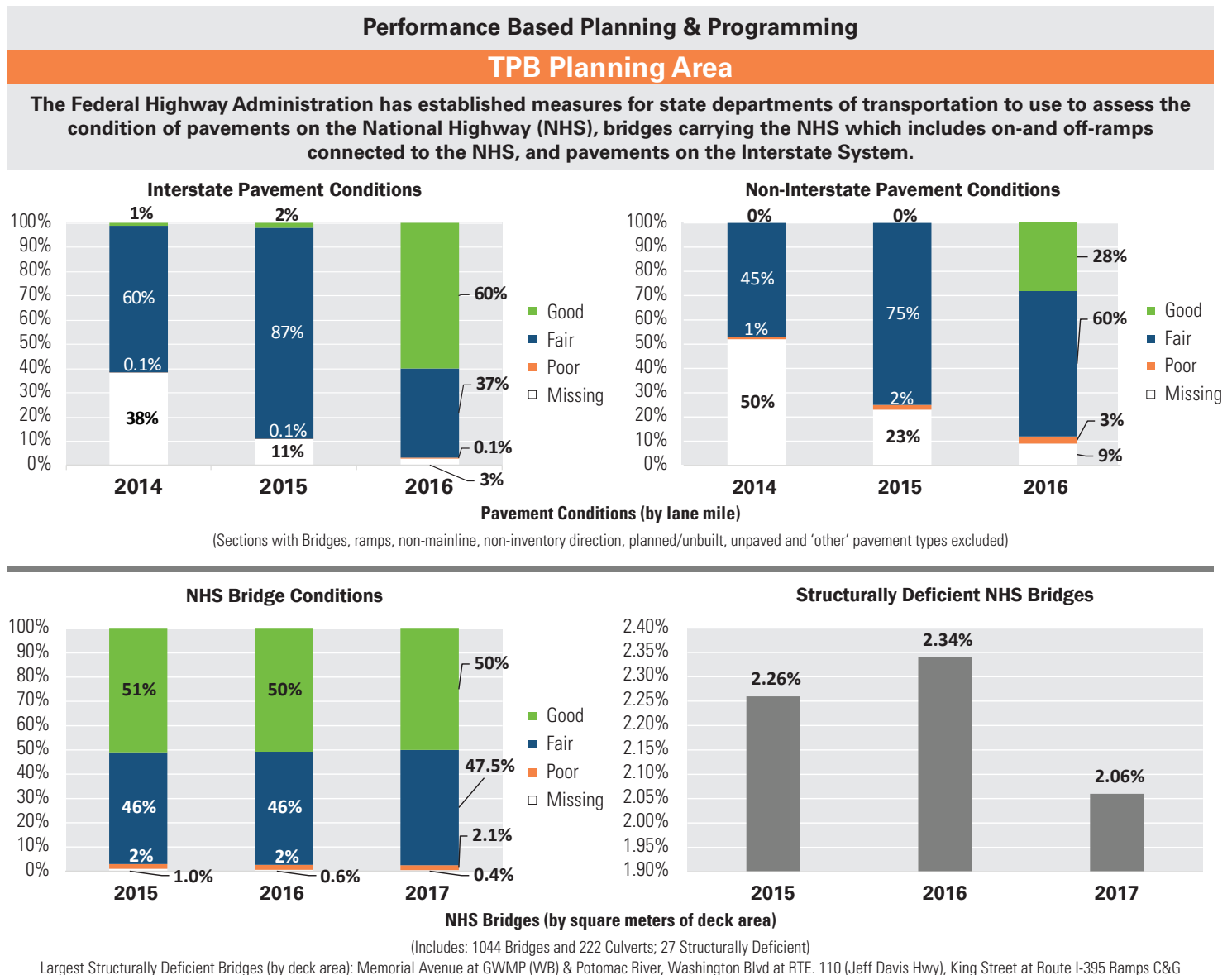
Highway Asset Management

Figure 6.3 shows the six specific federally-prescribed highway asset management measures for which the TPB is required to establish targets. The targets are established for the four-year period of 2018-2021 and are updated biennially to track the condition of highway pavement and bridges in the region.³ Once the targets are established, the TPB must collect data and report the performance outcomes for each measure biennially to the state DOTs and also include the results in the long-range transportation plan. The results of this monitoring effort are intended to inform future funding decisions on projects and programs that affect highway assets. The monitoring results are also intended to inform the next update of the target.

REGIONAL HIGHWAY ASSET TARGET SETTING APPROACH

The TPB's planning area, for which performance targets are to be established, lies within three different jurisdictions: the District of Columbia, Maryland, and Virginia. As such, regional highway asset targets were determined by identifying sub-targets for the District of Columbia, Maryland, and Virginia portions of the region and applying each state's target setting approach to their respective portion of the region. These sub-targets are informed by state-specific pavement and bridge condition results reported to federal databases. Targets for the region were developed by combining the sub-targets for each state-portion of the region to create the region-wide net result (see Figure 6.3).

Figure 6.3 Pavement and Bridge Condition for the TPB Planning Area



³ As required by federal Pavement and Bridge Condition Performance Measures rule, State DOTs must establish two-year and four-year targets on a biennial cycle. Additional detail: [gpo.gov/fdsys/pkg/FR-2017-01-18/pdf/2017-00550.pdf](https://www.gpo.gov/fdsys/pkg/FR-2017-01-18/pdf/2017-00550.pdf).

Highway System Performance

Figure 6.4 lists the five specific federally-prescribed highway system performance measures, through the lenses of congestion and freight, for which the TPB is required to establish targets.

WHAT IS THE NATIONAL PERFORMANCE MANAGEMENT RESEARCH DATA SET (NPMRDS)?

Since July 2013, the NPMRDS provides monthly average travel times on the National Highway System (NHS) and is used in calculating four of the measures in the System Performance measures final rule. The NPMRDS is a monthly archive of average travel times, reported every 5 minutes when data is available, on the NHS. The travel times are based on vehicle probe-based data and include “all traffic,” “freight,” and “passenger travel.” FHWA provides access to the NPMRDS to State DOT and MPO partners for their performance management activities.

The targets are established for a two- and four-year period (2018-2019 and 2018-2021) and are updated biennially to track the condition of highway pavement and bridges in the region.⁴ After the TPB established its targets in June and July 2018, it must collect data and report the performance outcomes for each measure to the Federal Highway Administration (FHWA). The results of this monitoring effort are intended to inform future funding decisions on projects and programs that affect highway assets. The monitoring results are also intended to inform the next update of the target.

Figure 6.4 System Performance Measures

Performance Measure	2018 - 2019 Two Year Target	2018 - 2021 Four Year Target
Interstate Travel Time Reliability (TTR)	Not Required	58.5%
NHS (Non-Interstate) Travel Time Reliability (TTR)	Not Required	72.7%
Freight Reliability (TTTR)	Not Required	2.12
Peak Hour Excessive Delay (PHED)*	Not Required	26.7 hours
Mode Share (Non-SOV)*	36.9%	37.2%

* Target set for the Washington, DC-MD-VA Urbanized Area

REGIONAL SYSTEM PERFORMANCE TARGET SETTING APPROACH

The TPB’s planning area, for which performance targets are to be established, lies within three different jurisdictions: the District of Columbia, Maryland, and Virginia. As such, regional highway safety targets were determined by using data from the National Performance Management Research Data Set (NPMRDS) that is input by the District of Columbia, Maryland, and Virginia portions of the region. The TPB then adopted its own methodology for forecasting future performance by applying related indicators from the region’s travel demand model to forecast two- and four-year performance for the region (see Figure 6.4).

In total, five measures are used to track system performance of the region’s highway system: Interstate Travel Time Reliability (TTR), Non-interstate National Highway System TTR, Truck TTR Index, Annual Hours of Peak Hour Excessive Delay (PHED) Per Capita, and Percent of Non-SOV Travel on the NHS.⁵



⁴ Under this rule, DOTs must establish two-year and four-year targets related to highway system performance on a biennial cycle. Additional detail: [gpo.gov/fdsys/pkg/FR-2017-01-18/pdf/2017-00681.pdf](https://www.gpo.gov/fdsys/pkg/FR-2017-01-18/pdf/2017-00681.pdf).

⁵ Interstate TTR, Non-interstate NHS TTR, Truck TTR Index, and the Annual Hours of PHED Per Capita can all be obtained through NPMRDS, either in raw form or with the measures calculated by the contracted entity supporting the data set. The TPB and the three states all used NPMRDS to determine their performance for these measures. Annual Hours of PHED and Percent of Non-SOV Travel on the NHS are calculated for the Washington, DC-MD-VA urbanized area, as defined by the Census Bureau, rather than for the MPO planning area. For these two measures, the applicable State DOTs and MPOs must coordinate on and collectively establish a single, unified 2-year (non-SOV only) and 4-year target (PHED and non-SOV) for each applicable urbanized area of greater than one million people. The TPB has set targets for the Washington DC-MD-VA urbanized area.

Vehicular Emissions

Figure 6.5 lists the two pollutants under the federally-prescribed vehicular emissions measure for which the states and the TPB are required to establish targets. The targets are established for a two- and four-year period (2018-2019 and 2018-2021) and are updated biennially to track the condition vehicular emission reduction in the region. Once the targets are established, the TPB must collect data and report the performance outcomes for each measure biennially to the state DOTs. The results of this monitoring effort are intended to inform future funding decisions on projects and programs that affect vehicle emissions. The monitoring results are also intended to inform the next update of the target.

REGIONAL EMISSIONS REDUCTIONS TARGET SETTING APPROACH

The TPB's planning area, for which performance targets are to be established, lies within three different jurisdictions: the District of Columbia, Maryland, and Virginia. Each state receives federal funds for the Congestion Mitigation and Air Quality (CMAQ) program. Federal CMAQ program funds are used for a wide range of qualifying projects that are expected to mitigate congestion or reduce emissions of select pollutants that affect air quality. As such, the states and the TPB must coordinate on and collectively establish a single, unified two- and four-year target for the estimated reductions in emissions of each applicable pollutant due to CMAQ funded projects.

The Washington, DC area is being monitored for air quality affected by Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NO_x) pollutants. Accordingly, the TPB has worked with the three states to collect any data on past emissions reductions calculations and on those anticipated in the next four years to set targets. Unlike all the other performance measures, the Emissions Reductions measure is based only on calculations and not on any data of actual performance or conditions.

Figure 6.5 CMAQ Program Targets: On-Road Mobile Emissions Reductions

	Pollutant	FFY 2018 - 2019 Two Year Target	FFY 2018 - 2021 Four Year Target
Emissions Reductions	Volatile Organic Compounds (VOCs)*	1.838 Kg/day	2.195 Kg/day
	Nitrogen Oxides (NO _x)*	4.019 Kg/day	4.703 Kg/day

* Target set for the TPB's portion of the Washington, DC-MD-VA Ozone nonattainment area



Transit Asset Management

Figure 6.6 lists the four specific federally-prescribed transit asset management measures for which providers of public transportation and the TPB must collect and report on for the TPB planning area. These measure the performance of transit asset management to ensure effective operation, maintenance, and improvements of capital assets through their useful life.⁶ The targets are established annually and developed along with a four-year plan for managing these capital assets. Providers first set targets by January 1, 2017 with the TPB adopting its initial set of transit asset targets in June 2017. The TPB must collect data and report the performance outcomes for each measure in the long-range transportation plan. The results of this monitoring effort are intended to inform future funding decisions on projects and programs that affect transit assets. The monitoring results are also intended to inform the next update of the target.



REGIONAL TRANSIT ASSET MANAGEMENT TARGET SETTING APPROACH

The TPB's planning area for which transit asset management performance targets are to be established includes seven Tier 1 agencies (public transportation operators of rail or more than 100 vehicles) and twelve Tier 2 agencies (operate less than 100 vehicles). Tier 1 agencies report their information to the FTA directly and to the TPB. Tier 2 agencies submit information to their respective state transit agencies, the Maryland Transit Administration or the Virginia Department of Rail and Public Transportation, which then group the information for reporting to the FTA and to the TPB. TPB collated the information and adopted the targets of the seven Tier 1 and the Tier 2 agencies for the region as a whole.

The four transit asset performance measures are split between two age-based (Rolling Stock and Equipment) and two condition-based measures (Condition of Infrastructure and Condition of Station/Facilities). For each type of asset, a threshold is established for permissible age or condition (e.g., a bus should be no more than 15 years old, or a facility should not have any failing components). Targets are set by the providers of public transportation on the maximum percentage of assets that are allowed to exceed the threshold (e.g., no more than 8% of buses can exceed 15 years old). Figure 6.6 presents the regional targets accounting for the differences in targets and standards among the region's providers of public transportation.

Figure 6.6 2017 Regional Transit Asset Management Targets
(Maximum percentage of assets allowed to exceed threshold condition)

Reporting Entity	Rolling Stock	Service Vehicles	Rail Infrastructure	Station/ Facility Condition
WMATA	1% Rail, 3% Bus	15% ^{c,d}	5%	32%
DDOT	0% Rail, 40% Bus	20% ^c	5%	20%
Fairfax Co.	10%	14% ^e	n/a	0%
Montgomery Co.	8% ^a	50% ^{c,d}	n/a	50% ^f
Prince George's Co.	0%	18% ^d	n/a	0%
PRTC	46% ^b	50% ^c	n/a	0%
VRE	0% Rail	50% ^e	n/a	0%
Maryland Tier 2 (MTA)	24% ^a	31% ^d	n/a	25% ^f
Virginia Tier 2 (DRPT)	20%	Not reported	n/a	20%

a: heavy-duty buses; b: 45-foot buses; c: autos; d: trucks; e: service vehicles; f: maintenance/administrative facilities

⁶ Additional detail: gpo.gov/fdsys/pkg/FR-2016-07-26/pdf/2016-16883.pdf

Transit Safety

The federal transit safety rules require providers of public transportation and the TPB to collect and report data for four performance measures that track the condition of transit safety in the TPB planning area.⁷ These measures include the number and rate of fatalities, injuries, safety events (derailments, collisions, fires, and evacuations), and also system reliability (mean distance between major and other mechanical system failures). Initial reporting on transit safety performance and establishment of targets is not required until July 2020 and will be the subject of coordination over the next year. Once the targets are established, the TPB must collect data and report the performance outcomes in the long-range transportation plan. The results of this monitoring effort are intended to inform future funding decisions on projects and programs that affect transit safety. The monitoring results are also intended to inform the next update of the target.

PBPP and the Financially Constrained Projects

The projects incorporated into the financially constrained element of Visualize 2045 and the projects and programs that are programmed for funding in the FY 2019-2024 TIP reflect the current goals of the region's transportation agencies. As the new PBPP process and its systematic measurement of performance versus targets is implemented, the plans and programs of the region's agencies, many of which already have considered similar goals, will evolve to more explicitly address performance and the targets.

Congestion Management Process

Like the TPB's PBPP activities, the TPB has an important role to play in understanding and identifying the full range of strategies to address traffic congestion in the region. Federal law requires the TPB to provide for "safe and effective integrated management and operation of the multimodal transportation system... through the use of travel demand reduction and operational management strategies."

Further information on the Congestion Management Process (CMP) can be found in [Appendix E: Congestion Management Process Federal Compliance and Impact on Plan Development](#). Detail on monitoring and evaluating transportation system performance can be found in separate publications, including the biennial CMP Technical Report (mwccog.org/CMP) and the quarterly Regional Congestion Reports (mwccog.org/congestion).

Overview

The CMP provides for a systematic approach to monitoring the performance of the region's transportation system and identifying and evaluating the benefits that various congestion management strategies may have. Through various programs, the CMP monitors the performance of the transportation system. With accurate and reliable data, the TPB and regional partners work to establish strategies and initiatives to help alleviate congestion. Both demand management and operational management strategies are pursued. Demand management seeks to reduce congestion by reducing the number of vehicles (especially single-occupant vehicles) on the road during high-volume time periods while operational management focuses on incident management, technology advances, and, when necessary, capacity increases.

THE POLICY CONTEXT

Aspirational Initiatives

Five of the initiatives are aimed at congestion and travel demand issues and can help the region better prepare for the impacts of congestion on the transportation network.

Planning Factors

- Promote efficient system management and operation.
- Support the economic vitality of the metropolitan area.
- Enhance the integration and connectivity of the transportation system.

RTPP Goals

- Maximize operational effectiveness and safety of the transportation system.

CMP activities benefit strongly from regional participation. The TPB Technical Committee, the Systems Performance, Operations, and Technology Subcommittee, and the Commuter Connections Subcommittee consult regularly on staff's work. Further, TPB's Commuter Connections program plays a critical role in implementing the most impactful strategies for demand management.

⁷ Additional detail: [gpo.gov/fdsys/pkg/FR-2017-01-18/pdf/2017-00678.pdf](https://www.gpo.gov/fdsys/pkg/FR-2017-01-18/pdf/2017-00678.pdf) and <https://www.gpo.gov/fdsys/pkg/FR-2018-07-19/pdf/2018-15167.pdf>

Ongoing Challenges

The region's transportation agencies regularly work in close coordination to address issues surrounding congestion management. Despite significant investments in mitigation strategies, congestion will continue to be a challenge as the region's population and employment continues to grow within the same geographic area. The CMP will continue to provide the critical data and strategies for addressing this regional challenge.

Safety Planning

A safe transportation system is a foundational element of a livable region. With approximately 260 deaths and nearly 3,000 serious injuries in crashes every year on the region's roads, improving safety of all modes is critical to improving the quality of life for citizens and visitors. The TPB works to reduce fatalities and serious injuries on the region's roadways and to meet regional-level transportation safety federal regulations that seek to "increase the safety of the transportation system for motorized and non-motorized users."⁸

Overview

Through the transportation planning process, PBPP, and the public participation process, the TPB ensures safety is considered throughout its programs and plans. Safety is a part of the long-range transportation planning process, it is considered in the projects that go into the financially constrained element of the long-range transportation plan, in PBPP measures and targets requirements, and throughout other Visualize 2045 elements. The TPB's Transportation Safety Subcommittee meets regularly to guide ongoing highway safety analysis, identify the most significant highway safety problems, and foster regional coordination. Further, the TPB leads the annual Street Smart Pedestrian and Bicycle Safety campaign to educate drivers, pedestrians, and bicyclists about safe use of the region's roadways.

⁸ Additional detail: 23 USC 134 (h)

SAFETY PLANNING

Aspirational Initiatives

The aspirational initiatives have the potential to improve safety in the region by enabling more people to use transit, which is safer than car travel, and improving access and safety for pedestrians and bicyclists.

Planning Factors

- Increase the safety of the transportation system.
- Support the economic vitality of the metropolitan area.
- Promote efficient system management and operation.

RTPP Goals

- Maximize operational effectiveness and safety of the transportation system.
- Ensure adequate system maintenance, preservation, and safety.



Visualize the Future

The TPB and regional partners are striving to reduce traffic fatalities and serious injuries. Maryland and Virginia support the Toward Zero Deaths national standard, and the District of Columbia, City of Alexandria, and Montgomery County have adopted Vision Zero policies – these programs and policies aim to achieve a highway system with no fatalities or serious injuries involving road traffic.

The public depends on regional leaders to continue to improve safety on the transportation network. While fatalities on the region's roadways dropped by about a third between 2006 and 2012, they have remained relatively steady since then. Regional safety planning must continue to be at the forefront of policy discussions for the reductions in fatalities to resume.

Ongoing Challenges

Every year, more than 45 billion miles of vehicle travel occur in the region. Addressing the complex issues of driver behavior, including distraction, impairment, speeding, and seat belt use, is difficult and requires continual effort. Further, the design and construction of infrastructure that is more forgiving of human error is challenging and resource intensive. The TPB and regional partners are committed to ensuring that the best policies, programs, and projects are implemented to reduce fatalities and injuries.