

Addendum 1: Performance Based Planning and Programming – Safety Performance Measures

Performance Targets

In accordance with the requirements of MAP-21 and the FAST Act, Virginia has established safety performance objectives as published in [Virginia’s 2017 - 2021 Strategic Highway Safety Plan \(SHSP\)](#) and, starting in 2017, annual targets in the Highway Safety Improvement Program (HSIP) Annual Report. The SHSP performance measure objectives are indicated in Table 1 below.

Table 1: 2017 – 2021 SHSP Safety Performance Objectives

	Performance Target	Per Year Reduction
1	Number of Fatalities	2%
2	Rate of Fatalities per 100 Million Vehicle Miles Travelled	3%
3	Number of Serious Injuries	5%
4	Rate Serious Injury Million Vehicle Miles Travelled	7%
5	Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries	4%

For safety performance measures 1, 2, and 3, annual targets are developed collaboratively by the Department of Motor Vehicles (DMV) Highway Safety Office (HSO) and VDOT HSIP staff.¹ The DMV HSO includes these measures in their Highway Safety Plan submitted to the National Highway Traffic Safety Administration (NHTSA) every June.

The Commonwealth Transportation Board approves all five annual targets and VDOT includes these in the HSIP Annual Report submitted to FHWA every August. Within 180 days of VDOT’s annual report submission to FHWA, MPOs must indicate their support of the state targets or submit their unique regional targets for one or more of the safety measures.

Connection to Other Performance Based Planning Documents

The federally required SHSP, a five-year multi-agency comprehensive plan focused on reducing fatalities and serious injuries on all public roads, serves as the coordinating document for other plans and programs that involve traffic safety. This coordination involves the long-range statewide transportation plan (LRSTP), the metropolitan transportation plans (MTP), and three plans that implement parts of the SHSP – the Highway Safety Plan (HSP), the HSIP, and the Commercial Vehicle Safety Plan (CVSP). This integration is important for improving overall

¹ It is a federal requirement that safety performance measures 1, 2, and 3 are identical targets for NHTSA’s Highway Safety Grants Program and FHWA’s Highway Safety Improvement Program. This requirement allows States to align their safety performance targets and work collaboratively to achieve them.

safety coordination amongst various partners and leads to more comprehensive transportation safety planning.

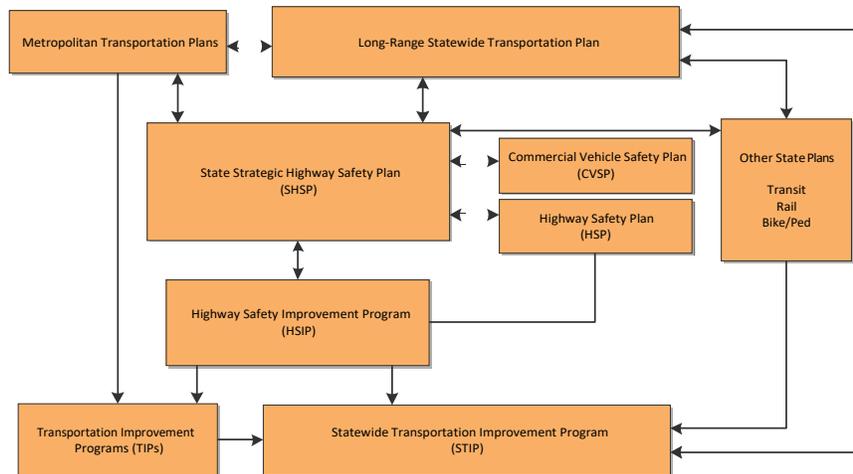
The LRSTP, VTrans2040, guides the state's investment decisions for transportation improvements. Safety and performance management is included in the VTrans2040 Vision, Goals & Objectives, and Guiding Principles:

- Guiding Principle 2: Ensure Safety, Security, and Resiliency – Provide a transportation system that is safe for all users, responds immediately to short-term shocks such as weather events or security emergencies, and adapts effectively to long-term stressors such as sea level rise.
- Guiding Principle 5: Ensure Transparency and Accountability, and Promote Performance Management – work openly with partners and engage stakeholders in project development and implementation, and establish performance targets that consider the needs of all communities, measure progress towards targets, and to adjust programs and policies as necessary to achieve the established targets.
- Goal C: Safety for All Users – provide a safe transportation system for passengers and goods on all travel modes.
 - Objectives:
 - Reduce the number and rate of motorized fatalities and serious injuries.
 - Reduce the number of non-motorized fatalities and injuries.

MTPs are similar to the LRSTP however a MTP covers a specific metropolitan planning area. MTPs include goals and objectives for their respective areas/regions and identify strategies for advancing long-term transportation investments in a specific region.

The HSP is an annual plan to address highway user behaviors that will improve safety through education and enforcement campaigns. The HSP and associated NHTSA grants are administered through the Highway Safety Office at the DMV. Furthermore, each year Virginia State Police (VSP) submits a Commercial Vehicles Safety Plan (CVSP) to Federal Motor Carrier Safety Administration as a requirement of obtaining related enforcement grants.

The relationship between the various plans and programs is shown below:



Projects in the STIP are directly linked to the safety objectives outlined in the SHSP through the strategies and actions that are priorities in Virginia.

Funding for Safety Projects

Safety targeted improvements are implemented through HSIP projects. Each year Virginia is allocated ~\$55 Million for HSIP and \$5 Million for Railway Grade Crossing improvements. Virginia is also subject to a Penalty Transfer provision, Section 154 “Open Container”, such that 2.5% of NHPP funds are reserved for either NHTSA Alcohol-Impaired Driving or HSIP projects. The State determines what proportion goes to each program. Of the HSIP funds, about 10 percent is set aside for non-motorized safety projects and 20 percent of the remainder for improvements on locally-maintained roadways.

How do Safety Projects get selected for Inclusion in the STIP?

The HSIP project planning and delivery follows these steps:

- Each year highway segment and intersection locations that have the highest potential for safety improvement are identified based on the previous five years of traffic crash and volume data. These above average crash locations are provided to the VDOT Districts to determine appropriate locations and countermeasures for HSIP funding. The potential for vehicle-train crashes at each at-grade railroad crossing is also distributed.
- HSIP project proposals are submitted through the SMART Portal for the appropriate safety program.
- VDOT and locality submitted HSIP proposals are reviewed and prioritized based on the number of targeted crashes and the benefit to cost ratio or the potential risk reduction for non-motorized and rail highway grade crossing improvements.
- Projects are selected and programmed for the last two or three years of the SYIP. At present there are over \$100 million of safety improvement proposals, with an expected benefit, that remain unfunded.

In recent years, programmed priority HSIP projects have shifted from being higher cost spot intersection and segment improvements to lower cost systemic improvements that target specific crash types and/or roadway characteristics that are factors in crashes across the network. Examples of systemic improvements include traffic signal devices and timing at intersections and curve signing, higher friction surfaces and rumble strips on segments.

Safety improvements are also included within projects funded with non-HSIP funds. The SMART SCALE scoring and prioritization process for inclusion of projects in the SYIP, considers safety benefits from improvements addressing travel of all modes. Many of the large SMART SCALE projects, upon completion, will have distinct impacts on safety performance in the Commonwealth. In addition, projects funded through other state and federal sources in the SYIP, such as the Transportation Alternatives Program, including Safe Routes to School grants, Revenue Sharing, and even some CMAQ and maintenance projects, will also have crash reduction benefits that contribute to improved safety performance.

Thus, the funding to meet Virginia's safety objectives and targets is allocated to projects in the CTB approved SYIP, and is consistent with VTrans2040. Since the SYIP is the foundation for the STIP, the program of projects in the STIP demonstrates support to achieve Virginia's safety performance objectives and targets and is consistent with Virginia's SHSP and the HSIP.

Addendum 2

Appendix X. Performance Based Planning and Programming for Transit Asset Management

The two most recent federal transportation laws, MAP-21 and FAST Act, establish performance measure requirements to ensure states and metropolitan planning organizations (MPOs) are investing transportation funds in projects that collectively will contribute towards the achievement of national goals. The USDOT recently published new rules for states and MPOs to collect data and establish performance targets that will support performance and outcome-based investment decisions.

The new federal performance measurement requirement for transit agencies focuses on one area: transit asset management (TAM). The measures look specifically at the percentage of revenue vehicles that have exceeded their Useful Life Benchmark (ULB), the percentage of non-revenue and service vehicles that have exceeded their ULB, and percentage of facilities with a condition below 3.0 on the Federal Transit Administrator's TERM Scale. All transit agencies receiving grants from the FTA are required to complete a TAM plan. The FTA has established two tiers of agencies based on size parameters.

- A Tier I agency operates rail, OR has 101 vehicles or more all fixed route modes, OR has 101 vehicles or more in one non-fixed route mode.
- A Tier II agency is a subrecipient of FTA 5311 funds, OR is an American Indian Tribe, OR has 100 or less vehicles across all fixed route modes, OR has 100 vehicles or less in one non-fixed route mode.

The first completed TAM plan must be sent to the National Transit Database (NTD) by October 1, 2018. Other required deadlines are found in the table below.

Reporting Activity	Reporting Deadline
Complete compliant TAM Plan	October 2018
Report FY18 asset data to NTD Submit FY19 targets to NTD	October 2018
Report FY19 asset data to NTD Submit FY20 targets to NTD Submit narrative report to NTD	October 2019
Report FY20 asset data to NTD Submit FY21 targets to NTD Submit narrative report to NTD	October 2020
Complete updated TAM Plan	October 2022

Table 1: Transit agency deadlines for TAM Rulemaking for June-July fiscal year

The Department of Rail and Public Transportation (DRPT) has opted to sponsor a group TAM plan for Tier II providers. Tier I providers are not eligible for group plans.

For Tier II providers under the DRPT Group Plan, any Transportation Improvement Program (TIP) document or Metropolitan Transportation Plan (MTP) adopted after October 1, 2018 will be in compliance with the TAM Plans developed by DRPT and adopted by the Tier II transit providers within the MPO as well as the regional performance measures adopted by the MPO as a whole. The performance measurements and the targets can be found in the DRPT *Group Transit Asset Management Plan*.

The WinFred MPO planning process will integrate, either directly or by reference, the goals, objectives, performance measures, and targets described in the Tier II group plan.

Addendum 3: Performance Based Planning and Programming – Pavement and Bridge Performance Measures

Performance Targets

In accordance with the requirements of MAP-21 and the FAST Act, Virginia has established pavement and bridge condition performance targets as reported in Virginia’s Baseline Performance Period Report for 2018-2021¹. This report, submitted to FHWA in October 2018, satisfies the federal requirement that State DOTs submit a Baseline Performance Period Report to FHWA by October 1st of the first year in a performance period. Performance measures for pavement condition are required for the National Highway System (NHS), while bridge condition requirements relate to structures identified as part of the National Bridge Inventory on the NHS. The pavement condition measures and established performance targets for the 2018-2021 performance period are indicated in Table 1 below.

Table 1: Pavement Condition Measures and Performance Targets

Interstate Pavement Condition Measures²	CY 2018-2019 Two Year Target	CY 2018-2021 Four Year Target
Percentage of Pavements in Good Condition	N/A ³	45.0%
Percentage of Pavements in Poor Condition	N/A ³	3.0%
Non-Interstate NHS Pavement Condition Measures⁴	2018-2019 Two Year Target	2018-2021 Four Year Target
Percentage of Non-Interstate Pavements in Good Condition	25.0%	25.0%
Percentage of Non-Interstate Pavements in Poor Condition	5%	5.0%

Bridge condition measures and established performance targets for the 2018-2021 performance period are indicated in Table 2 below.

¹ Virginia’s Baseline Performance Period Report data is through December 2017.

² Interstate condition measures are based on four distresses: International Roughness Index (IRI), cracking, rutting, and faulting.

³ During this first performance period, States are not required to establish 2-year targets for interstate pavements; however, Virginia has chosen to establish performance targets and are 45.0% and 3.0% for percentage of pavements in good and poor condition, respectively.

⁴ During this first performance period, Federal requirements for Non-Interstate NHS pavement condition and performance targets are based on a single distress, IRI. However, Federal guidance outlined in a September 27, 2018 Memorandum on State DOT Targets for Non-Interstate NHS Pavement Measures allows for the use of full distress data when reporting Non-Interstate NHS performance targets. Given the availability of full distress data, Virginia has chosen this approach and reported performance targets for Non-Interstate NHS pavements based on all four distresses. This allows for consistency in assessing the condition and setting performance targets for both Interstate and Non-Interstate NHS pavements.

Table 2: NHS Bridge Condition Measures and Performance Targets

NHS Bridge Condition Measures	CY 2018-2019 Two Year Target	CY 2018-2021 Four Year Target
Percentage of Deck Area of NBI Bridges on the NHS in Good Condition	33.5%	33.0%
Percentage of Deck Area of NBI Bridges on the NHS in Poor Condition	3.5%	3.0%

Background/History

Virginia’s history of monitoring asset conditions and utilizing performance information to determine investment strategies based on available funding levels spans over 10 years for pavements and bridges.

VDOT maintains a comprehensive inventory of all pavement and bridges on the state-maintained network. This inventory, which includes location, maintenance responsibility, ownership, and current condition or inspection information, serves as the foundation for life cycle planning, performance forecasting, maintenance and rehabilitation needs estimation, as well as prioritization of work to maximize asset life given available funding. Condition information is also important for communicating with external stakeholders, including the general public.

VDOT’s commitment to responsible Transportation Asset Management (TAM) practice is demonstrated through VDOT’s annual condition data collection programs and its establishment and publication of network level pavement and bridge performance goals. VDOT’s current condition measures and performance goals have been in place for many years and are fully integrated into VDOT’s budgeting process and investment strategies.

The federal pavement and bridge performance measures apply to a limited portion of the network for which VDOT is responsible (less than 15% of all lane miles and 18% of the bridge inventory).

Connection to Other Performance Based Planning Documents

VTrans, the state’s long-range multimodal plan, provides the overarching vision and goals for transportation in the Commonwealth. The long-range plan provides a vision for Virginia’s future transportation system and defines goals, objectives, and guiding principles to achieve the vision. It also provides direction to state and regional transportation agencies on strategies and policies to be incorporated into their plans and programs. The most recent approved long-range multimodal plan is VTrans2040.

Performance management, specifically as it relates to pavements and bridges, is included in the VTrans2040 Vision, Goals & Objectives, and Guiding Principles as noted below:

- Guiding Principle 5: Ensure Transparency and Accountability, and Promote Performance Management - Work openly with partners and engage stakeholders in project development and implementation, and establish performance targets that consider the needs of all communities, measure progress towards targets, and to adjust programs and policies as necessary to achieve the established targets.
- Goal D: Proactive System Management - maintain the transportation system in good condition and leverage technology to optimize existing and new infrastructure.
 - Objectives:
 - Improve the condition of all bridges based on deck area.
 - Increase the lane miles of pavement in good or fair condition.

Virginia's federally required Transportation Asset Management Plan (TAMP) presents pavement and bridge inventory and conditions, along with the Commonwealth's performance objectives, measures, and associated risks as they relate to the federal requirements. Asset funding, investment strategies, forecasts, goals, and gaps are also included. The TAMP is specific to the NHS and provides the Commonwealth's Transportation Asset Management (TAM) processes and methodology to meet federal requirements. Pavement and bridge projects included in the STIP are consistent with Virginia's reported TAM processes and methodology.

The program of projects in the STIP are directly linked to the pavement and bridge objectives outlined in VTrans2040 and the TAMP through the strategies and actions that are priorities in Virginia.

Funding for Pavement and Bridge Projects

There are two key funding sources for pavement and bridge projects, the Highway Maintenance and Operations Fund (HMOF) and State of Good Repair (SGR) program funds. The pavement and bridge funding is used for differing projects from routine maintenance to reconstructive work. Funds are allocated to pavement and bridge projects based on an annual needs assessment process supported by a data-driven prioritization and selection process. The prioritization process is the same for the various funding sources; however, the [State of Good Repair](#) program funds are designated for deteriorated pavements and structurally deficient bridges.

The SGR program requires funds be distributed proportionality between VDOT and localities, based on assessed needs. More details, including the requirements for pavements and bridges, and the SGR prioritization process methodology, can be found at: [State of Good Repair for Bridges](#) and [Local Assistance Funding Programs](#).

VDOT has developed a robust asset management program, placing maintenance of the transportation network at the forefront of VDOT's investment decisions. This commitment to responsible asset management practice is demonstrated through VDOT's annual collection of condition data on pavements and bridges along with its establishment and publication of network-level pavement and bridge performance targets. For more than a decade, VDOT has

monitored pavement and bridge conditions using performance information (measures and targets) to determine investment strategies based on available funding levels.

In the annual needs assessment process, VDOT assesses 100% of the pavement network on Virginia's Interstate and Primary systems and approximately 20% of the Secondary system. In 2016, VDOT assessed 100% of the Secondary pavement network to create a condition baseline. The pavement condition data is compiled, analyzed and reviewed to report the optimized needs at a roadway system and district level. VDOT's pavement program selects resurfacing projects, in relation to needs, and optimizes the timing of projects through a data-driven pavement management system.

For bridges, VDOT follows national standards in performing safety inspections and determining general condition of the structures. Condition assessments are performed by certified safety inspection personnel. The inspection program requires a qualified inspector to complete a "hands-on" review of the structure or bridge during each inspection. By federal regulation, VDOT is required to conduct detailed inspections of NBI structures at intervals not to exceed 24 months. VDOT uses BrM software to store bridge condition and inventory data for each structure and to program, schedule, and track bridge and structure inspections. The data collected during inspections allows VDOT to use a proactive approach to maintenance. Preventive maintenance and timely intervention repairs are performed to avoid and slow deterioration that leads to greater rehabilitation or replacement cost. Virginia's bridge maintenance program is large and complex, so in order to direct its efforts more easily, performance targets have been developed.

VDOT uses a prioritization process when determining funding for the pavement and bridge programs and prioritizes work ranging from preventative maintenance to replacement. The prioritization processes take into account similar factors such as condition, cost effectiveness, maintenance history, and traffic volumes. While the systematic prioritization processes are a guide to assist in funding projects, districts direct the work performed as the local experts.

How do Pavement and Bridge Projects get selected for Inclusion in the STIP?

As noted above, the funding to meet Virginia's pavement and bridge objectives and targets is allocated to projects in the CTB-approved SYIP and is consistent with VTrans2040. Each spring, the public is invited to comment on projects included in the draft SYIP prior to CTB approval. Since the SYIP is the foundation for the STIP, the program of projects in the STIP demonstrates support to achieve Virginia's pavement and bridge performance objectives and targets and is consistent with Virginia's TAMP.

Addendum 4: Performance Based Planning and Programming – Highway System Performance

Performance Targets

In accordance with the requirements of MAP-21 and the FAST Act, Virginia has established performance targets for three reliability performance measures to assess the Highway System Performance. All three measures are included in Virginia’s Baseline Performance Period Report for 2018-2021 which was submitted to FHWA in October 2018. This report satisfies the federal requirement that State DOTs submit a Baseline Performance Period Report to FHWA by October 1st of the first year in a performance period and establishes baseline performance as of December 31, 2017.

Performance of the NHS is measured by the level of travel time reliability. The travel time reliability performance measures and performance targets for the 2018-2021 performance period are indicated in Table 1 below.

Table 1: National Highway System Travel Time Reliability Performance Measures and Targets

NHS Travel Time Reliability Performance	CY 2018-2019 Two Year Target	CY 2018-2021 Four Year Target
Percent of Person Miles Traveled on the Interstate That Are Reliable	82.2%	82.0%
Percent of Person Miles Traveled on the Non-Interstate NHS That Are Reliable	N/A ¹	82.5%

The assessment for freight reliability is based on the truck travel time reliability index. The truck travel time reliability performance measure and performance targets for the 2018-2021 performance period are indicated in Table 2 below.

Table 2: Freight Reliability Performance Measure and Targets

Truck Travel Time Reliability Performance	CY 2018-2019 Two Year Target	CY 2018-2021 Four Year Target
Truck Travel Time Reliability Index	1.53	1.56

The Commonwealth Transportation Board (CTB) approves the performance measures and targets developed for Virginia’s surface transportation network. Such targets, including those for Highway System Performance, are linked to the goals and objectives in Virginia’s long-range transportation plan, or VTrans.

¹ During this first performance period, States are not required to establish 2-year targets for the Non-Interstate NHS reliability measure.

Connection to Other Performance Based Planning Documents

VTrans, the state's long-range multimodal plan, provides the overarching vision and goals for transportation in the Commonwealth. The long-range plan provides a vision for Virginia's future transportation system and defines goals, objectives, and guiding principles to achieve the vision. It also provides direction to state and regional transportation agencies on strategies and policies to be incorporated into their plans and programs. The most recent approved long range multimodal plan is VTrans2040.

VTrans2040 identifies the most critical transportation needs in Virginia to ensure the overarching transportation goals in the long-range plan are achieved. The screening process was informed by a data-driven approach that considers highway system performance measures and targets in addition to other performance indicators.

Performance management, as it relates to the reliability of the NHS and freight, is included in the VTrans2040 Vision, Goals & Objectives, and Guiding Principles as noted below:

- Guiding Principle 4: Consider Operational Improvements and Demand Management First
 - Maximize capacity of the transportation network through increased use of technology and operational improvements as well as managing demand for the system before investing in major capacity expansions.
- Goal A – Economic Competitiveness and Prosperity: invest in a transportation system that supports a robust, diverse, and competitive economy.
 - Objectives:
 - Reduce the amount of travel that takes place in severe congestion.
 - Reduce the number and severity of freight bottlenecks.
 - Improve reliability on key corridors for all modes.
- Goal B – Accessible and Connected Places: increase the opportunities for people and businesses to efficiently access jobs, services, activity centers, and distribution hubs.
 - Objectives:
 - Reduce average peak-period travel times in metropolitan areas.
 - Reduce average daily trip lengths in metropolitan areas.
 - Increase the accessibility to jobs via transit, walking and driving in metropolitan areas.

Additionally, the Virginia Freight Element (VFE), a component of VTrans2040, discusses freight system trends, needs, and issues. The VFE also includes freight policies, strategies, and performance measures that guide Virginia's freight-related investment decisions.

Projects included in the STIP are directly linked to the Highway System Performance objectives outlined in VTrans2040 and associated needs analysis, and the VFE through the strategies and actions that are priorities in Virginia.

Funding for Highway System Performance Projects

SMART SCALE, Virginia's data-driven prioritization process for funding transportation projects, considers the potential of a project to improve reliability. In order to be considered for SMART SCALE, a project must first meet a need identified in VTrans2040, thus strengthening the connection between the planning and programming processes. Congestion mitigation, safety, accessibility, economic development, environment, and land use are the factors used to score SMART SCALE projects. Freight considerations are included in the economic development factor.

The FAST Act established a National Highway Freight Program, including a freight-specific funding program to highlight the focus on freight transportation needs. Projects eligible for National Highway Freight Program (NHFP) funding must contribute to the efficient movement of freight on the National Highway Freight Network (NHFN) and be included in the VFE. VDOT uses NHFP funding to construct freight beneficial projects identified through the SMART SCALE process.

SMART SCALE screening and scoring results, along with public feedback and CTB guidance, are used to develop the SYIP.

Other projects selected for funding are subject to program specific prioritization processes approved by the CTB. All funding (federal, state, and other sources) for transportation projects are allocated to projects in the CTB approved SYIP.

How do Highway System Performance Projects Get Selected for Inclusion in the STIP?

As noted above, the funding for all transportation projects, including funding for projects to meet Virginia's NHS system performance and freight movement targets is allocated to projects in the CTB approved SYIP, and is consistent with VTrans2040 and the VFE. Since the SYIP is the foundation of the STIP, the program of projects in the STIP demonstrates support to achieve Virginia's NHS and Freight Reliability performance objectives and targets.