Chapter 6: Performance-Based Programming and Project Evaluation

The SAWMPO is dedicated to improving the region's transportation network by working with its member agencies, VDOT, DRPT, FHWA, and FTA to implement regional performance-based programming measures that support and advance regional, state, and national transportation performance goals. With the passage of Moving Ahead for Progress in the 21st Century (MAP-21) in 2012, and the subsequent Fixing America's Surface Transportation (FAST) Act in 2016, the FHWA and FTA mandated that States and MPOs establish performance measures to integrate system-performance management into the transportation and transit planning process.

The MPO's Travel Demand Model outputs and project evaluation matrix address a range of performance measures that align with the federal and state requirements identified in MAP-21 and VTrans 2045, as well as input from the SAWMPO Working Group and local jurisdictions.

This chapter addresses:

6 — 1 Performance-Based Programming
6 — 2 SAWMPO LRTP Goals
6 — 3 2045 Travel Demand Model Scenarios
6 — 4 Project Evaluation

6 – 1 Performance-Based Planning

Performance-based planning is a data-driven approach that ensures transportation investment decisions meet established goals. Performance measures involve evaluating progress toward meeting goals and using information on past and anticipated future performance trends to inform investment decisions. In order to guide the integration of system performance measures into the planning process, the FHWA and FTA identified the following seven national performance measures outlined in MAP-21:

1. Safety - To achieve a significant reduction in traffic fatalities and serious injuries on all public roads
2. Infrastructure Condition - To maintain the highway infrastructure asset system in a state of good repair
3. Congestion Reduction - To achieve a significant reduction in congestion on the National Highway System
4. System Reliability - To improve the efficiency of the surface transportation system
5. Freight Movement and Economic Vitality - To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development

6. Environmental Sustainability - To enhance the performance of the transportation system while protecting and enhancing the natural environment
7. Reduce Project Delivery Delays - To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

The national performance measures inform the plan's goals and project evaluation metrics. Additionally, as mentioned in **Chapter 4**, the MPO's Travel Demand Model is a tool that tests the outcomes of individual projects in reference to the policy goals and objectives identified by federal and state measures.

Consistency with Other Planning Documents

Advancing the seven national performance goals ensures that transportation networks continue to develop and operate in a safe and efficient manner. To ensure the implementation of these measures in the SAWMPO region, the 2045 LRTP should also be consistent with other state and local plans, such as local comprehensive plans and regional policy plans.

Federal regulations require that the LRTP is consistent with the performance measures and implementation schedule included in the SAWMPO's short-range planning document, the Transportation Improvement Plan (TIP). The SAWMPO adopts a set of performance measures in coordination with VDOT and DRPT and documents the measures in the TIP appendix. The measures ensure that the MPO meets the federal performance-based planning requirements.

6 – 2 SAWMPO LRTP Goals

Goals are essential components of the long-range planning process and are used to guide the development of projects in the transportation area. The LRTP goals, which were first established for the 2040 LRTP, provide a basis for evaluating transportation projects and reflect the priorities of the SAWMPO jurisdictions. SAWMPO staff and the LRTP Working Group reviewed the 2040 goals to ensure that they align with current federal MAP-21 goals, statewide VTrans 2045 goals, and SMART SCALE factors (see **Table 6**).

Table 6: 2045 LRTP Goals in relation to federal and state program goals

SAWMPO 2045 LRTP Goal	MAP-21	VTrans 2045	SMART SCALE
Goal 1 – Economy Support and improve the economic vitality of the region by encouraging a transportation system that provides access to jobs, and education, and attracts businesses and entrepreneurs to the region.	Freight Movement and Economic Vitality	Economic Competitiveness and Prosperity	Economic Development

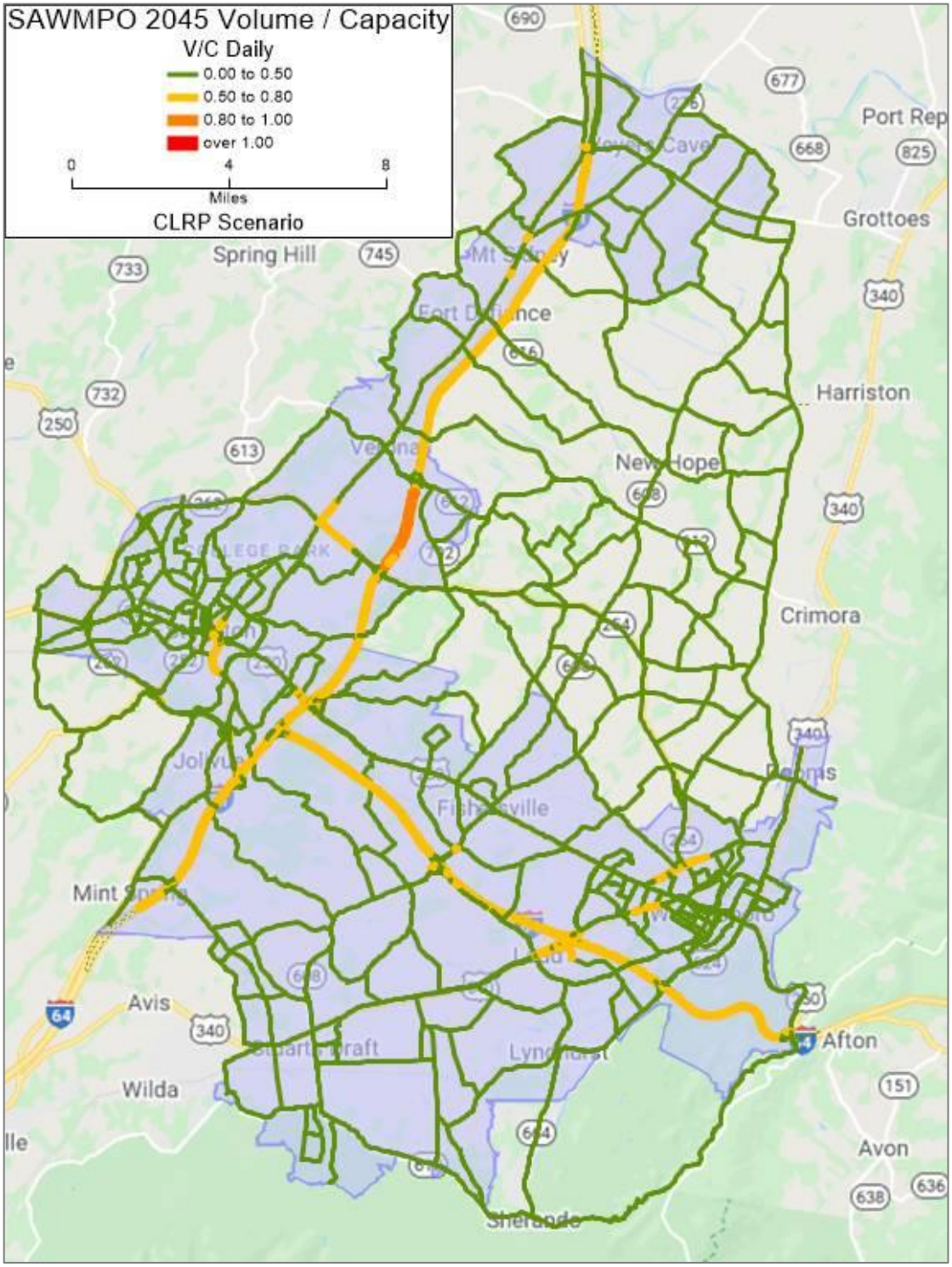
SAWMPO 2045 LRTP Goal	MAP-21	VTrans 2045	SMART SCALE
Goal 2 – Efficient system management Maintain existing transportation systems and facilities and promote efficient system management	Infrastructure Condition, System Reliability, and Congestion	Proactive System Management	Congestion
Goal 3 – Safety Increase the safety and security of the transportation system for all users.	Safety	Safety for all users	Safety
Goal 4 – Land use coordination Encourage the coordination of land use and transportation planning for transportation improvements to support future growth.	Reduce Project Delivery Delays	Proactive System Management	Land Use
Goal 5 – Connectivity Ensure connectivity of the transportation system across modes for the transport of both people and goods.	-	Accessible and Connected Places	-
Goal 6 – Accessibility Provide an efficient, reliable transportation system for pedestrians, bicyclists and transit users, including traditionally underserved populations.	-	Accessible and Connected Places	Accessibility
Goal 7 – Quality of life Improve quality of life by protecting and enhancing historic and natural resources, promoting energy conservation, maintaining air quality, and expanding regional recreation networks.	Environmental Sustainability	Healthy Communities and Sustainable Transportation Communities	Environment

VTrans 2045, which was outlined in **Chapter 4**, establishes goals to guide long-term statewide transportation planning and policy. The VTrans 2045 Mid-term Needs, which are organized around the VTrans goals, were released in 2019 and identify transportation needs over a 10-year period. Any potential transportation projects submitted to SMART SCALE must first meet a need identified in VTrans 2045.

6 – 3 2045 Travel Demand Model Scenarios

SAWMPO's performance-based planning program uses a regional Travel Demand Model and project evaluation based on the LRTP goals to program projects in the CLRP. 2045 Travel Demand Model scenarios evaluated the congestion mitigation of future projects. The first scenario, the Existing + Committed scenario, also referred to as the "No Build" scenario, is described in **Chapter 5**. The second 2045 scenario includes the additional construction projects in the CLRP for which funding has not yet been identified, but which the MPO and localities intend to fund in the coming 25 years. **Map 25** displays the 2045 CLRP scenario Volume to Capacity ratios for the peak hour. This map corresponds to **Maps 20 and 21 in Chapter 5**, which illustrate the same information for the 2018 base year scenario and the 2045 Existing + Committed scenario.

Map 25: 2045 CLRP Volume / Capacity



6 – 4 Project Evaluation

A central requirement of the LRTP is identifying future transportation projects that address the region's needs. Two project lists — the Constrained Long Range Plan (CLRP) and the Vision List – documents 67 different transportation projects in the SAW region (see **Chapter 8 and Appendix A**). New projects are added to the CLRP based on a project evaluation methodology that includes the Plan's goals, analysis from the Travel Demand Model (**Chapter 5**), and VDOT planning-level project cost estimates. The output is a scored list of projects that help determine how projects address the region's transportation needs and priorities.

Project Scoring Methodology

The SAWMPO Working Group established the project evaluation methodology to meet the performance-based planning requirements of MAP-21 and the FAST Act, and the Plan's goal. Each goal was ranked to reflect the region's transportation needs and priorities. The rankings were used to establish percentage weights for the goals in project scoring.

Each goal is similar to the factors used to score SMART SCALE projects to better understand how projects might score in the program, which is now the main source of funding for transportation projects in the State. As a result, projects are evaluated by the following six goal areas and percentage weights: Congestion Mitigation (15%), Safety (24%), Accessibility (14%), Economic Development (20%), Environment (12%), and Land Use (7%).

A total of 39 projects were evaluated using the methodology in **Table 7**. The full Project Scoring table is in **Appendix C**.

Table 7: Project Performance Evaluation Methodology

SMART SCALE GOAL AREA & WEIGHT	SAWMPO LRTP GOAL AREA & WEIGHT	SMART SCALE Measure	SAWMPO Measure	Application of Measures	Notes
Congestion Mitigation (15%)	Maintain existing transportation systems and facilities and promote efficient system management **(15%)**	Decrease in person hours of delay (50%)	Reduction in vehicle hours traveled (VHT) per capita (50%)	Before and After project change in VHT/Capita in 2045 Travel Demand Model.	Does project reduce Vehicle Hours Traveled/ Capita? Limited number of projects were applicable to model in TDM (new alignments, widenings, road diets only). However, no project locations are indicated as approaching capacity (V/C > 0.8) in 2045 TDM. Therefore, all projects that are unable to be modeled are assumed to have no change to VHT/capita in 2045 TDM (project score is 0).
		Increase in person throughput (50%)	Increase in person throughput (50%)	Apply Smart Scale locality pedestrian and bicycle factors to the Peak Hour Volume (PHV) of the project location to estimate future non-motorized person throughput.	Since no project locations are indicated as approaching capacity (V/C > 0.8) in 2045 TDM, there is no increase in vehicular person throughput for any project. Therefore, only an increase in non-motorized person throughput is considered

SMART SCALE GOAL AREA & WEIGHT	SAWMPO LRTP GOAL AREA & WEIGHT	SMART SCALE Measure	SAWMPO Measure	Application of Measures	Notes
					in scoring (pedestrians and cyclist).
Safety (25%)	Increase the safety and security of the transportation system for all users. **(24%)**	Equivalent property damage only (EPDO) of fatal and injury crashes expected to be reduced (50%)	Equivalent property damage only (EPDO) of fatal and injury crashes expected to be reduced (50%)	Apply appropriate Crash Modification Factor (CMF) to 5-year EPDO crash totals of project location. See Pg 54-57 in Smart Scale FY 2022 Technical Guide.	Does project reduce number of Fatal and injury crashes? Smart Scale Round 4 methodology utilized that includes revised CMFs with pedestrian, bicycle, and widening projects being targeted (only certain crash types considered in scoring).
		Equivalent property damage only (EPDO) of fatal and injury crash rate expected to be reduced (50%)	Equivalent property damage only (EPDO) of fatal and injury crash rate expected to be reduced (50%)	Apply appropriate Crash Modification Factor (CMF) to 5-year EPDO crash rate (based on 100 million Vehicle Miles Traveled (VMT)) of project location. See Pg 58-59 in Smart Scale FY 2022 Technical Guide.	Does project reduce rate of fatal and injury crashes per 100 million Vehicle Miles Traveled (VMT)? Smart Scale Round 4 methodology utilized that includes revised CMFs with pedestrian, bicycle, and widening projects being targeted (only certain crash types considered in scoring).
Accessibility (25%)	Provide an efficient, reliable transportation system for pedestrians, bicyclists and transit users, including traditionally underserved populations. **(14%)**	Increase access to jobs (60%)	Evaluation of roadway characteristics in terms of importance in the regional network	Equation considers functional classification (numerical scale), AADT, and employment density from ED.1 output. See Pg 69 in Smart Scale FY 2022 Technical Guide.	Functional Classification is an existing nationally accepted qualifier for roadway hierarchy (with local input). This was used as a simplified approach for considering accessibility improvements.
		Increase access to jobs for disadvantaged populations (20%)	Move into Access to Multimodal Travel Choices	Equation considers improvement type (point scale based on project elements - Table 8.2 (Pg 73) in Smart Scale FY 2022 Technical Guide) and Smart Scale pedestrian and bicycle locality factors, which includes transit system, and park and ride lot improvements.	Other scoring considerations could include distance, person throughput score, and disadvantage populations and HH income of adjacent TAZs.
		Increase access to multimodal travel choices (20%)	Project includes transit, bicycle and/or pedestrian improvements (becomes 40%)		
Economic Development (25%)	Support and improve the economic vitality of the region by encouraging a transportation system that provides access to jobs, and education, and attracts businesses and entrepreneurs to the region**. (20%)**	Project support for Economic Development (70%)	Decay weighted job growth next to project (70%)	Points are based on the distance decay weighted quantity of 2018-2045 job growth adjacent to the project by multiple project buffers (.5, 1, or 3 miles). Growth areas were predicted by the localities for travel demand model. See pg. 79 in FY 2020 Smart Scale Technical Guide.	Multiple buffers were applied to each project depending on project improvement type to address the question of does project support job growth areas?
	Ensure connectivity of the transportation system across modes for the transport of	Intermodal Access and Efficiency/ Tons of goods impacted (30%)	Intermodal access and efficiency/tons of goods impacted (30%)	See Table 10.8 (Pg. 88) in Smart Scale FY 2022 Technical Guide.	Does project enhance freight movement, access, efficiency?

SMART SCALE GOAL AREA & WEIGHT	SAWMPO LRTP GOAL AREA & WEIGHT	SMART SCALE Measure	SAWMPO Measure	Application of Measures	Notes
	both people and goods. **(8%)**				
Environment (10%)	Improve quality of life by protecting and enhancing historic and natural resources, promoting energy conservation, maintaining air quality, and expanding regional recreation networks. **(12%)**	Air Quality and Environmental Effect (50%)	Air quality and environmental effect (50%)	See Pg 74-75 in Smart Scale FY 2022 Technical Guide. Using Table 9.2. *Not scaling the measure by # of non-SOV peak users.	Does project have the potential to improve air quality or reduce greenhouse gas emissions?
		Impact to Natural and Cultural Resources (50%)	Amount of potentially impacted natural and cultural resource acres by the total 1/4-mile buffer area in acres (50%)	See Pg 76-78 in Smart Scale FY 2022 Technical Guide. *Not scaling based on benefits in other categories as explained on page 78.	Does project minimize impact on natural and cultural resources within a 1/4-mile boundary?
Land Use (0%)	Encourage the coordination of land use and transportation planning in order for transportation improvements to support future growth. **(7%)**	Support of transportation-efficient land development (100%)	EPA Guide to Sustainable Transportation Performance Measures Employment to Dwelling Ratio	1-Absolute Value = ((MPO pop/MPO jobs) x TAZ project buffer pop)-TAZ project buffer jobs/((MPO pop/MPO jobs) x TAZ project buffer pop)+TAZ project buffer jobs.	Equation results closer to 1 represent the TAZ mirrors the region in terms of population and jobs balance. A .5-mile project buffer was applied to all projects.

6 – 5 Summary

The 2045 LRTP updates the 2040 LRTP's goals to meet current federal and state performance-based planning requirements. The region's goals are informed by MAP-21 goals, the FAST Act, and VTrans 2045 goals, and regional priorities. The MPO's Travel Demand Model outputs measure specific projects to further ensure goals are addressed.

The LRTP Working Group developed a project scoring methodology that reflects the needs of each locality and provides an objective scoring framework to evaluate projects in the region. The methodology includes the Plan's goals, Travel Demand Model outputs, SMART SCALE project factors weighted to reflect the region's priorities, and planning-level cost estimates.

The subsequent chapters outline the final project list development process. The next step is evaluating how the cost estimates of the highest scoring projects relate to the projected transportation revenues for the region over the 25-year period (see **Chapter 7**). The final CLRP list of projects is provided in **Chapter 8**.