Winchester Frederick County (WinFred) MPO
TECHNICAL ADVISORY COMMITTEE (TAC) Meeting
February 5, 2019 - 10:00 a.m.
Winchester Regional Airport – Main Terminal Conference Room
491 Airport Road, Winchester, VA

AGENDA

1. **Administrative Items:**
   a) Welcome and Introductions
   b) Review and approval of the December 4, 2018 Technical Advisory Committee Meeting Minutes ***(Attached)***

2. **Public Comment Period**

3. **Overview of the Winchester Regional Airport (10 minutes) – Nick Sabo, Winchester Regional Airport Authority**

4. **Draft Methodology for CLRP and Vision Plan Update (Attachment) (30 minutes) – John Madera/Brad Reed**

   VDOT Staunton District staff has developed a methodology for presentation and discussion.

5. **Upcoming Meeting Schedule (MPO Meetings are held at the Frederick County Administrative Offices but may be subject to change):**
   - Project Steering Meeting: TBA
   - Policy Board: February 20, 2019
   - Technical Advisory Committee: March 5, 2019

6. **VDOT/DRPT/Staff Updates (10 minutes)**

7. **Other Business (5 minutes)**

8. **Adjourn**

Definition of Acronyms on next page

Glossary of Acronyms

CAC- Citizen Advisory Committee- Serves as an advisory committee to the MPO Policy Board to solicit public input and provide citizen perspective on MPO projects. Conducts public hearings and public input sessions on selected projects at the direction of the Policy Board.

CLRP – Constrained Long Range Plan – A fiscally-constrained list of projects drawn from the Vision Plan element of the LRTP. All CLRP projects must have an estimated cost and a revenue source identified.

CMAQ- Congestion Mitigation and Air Quality Improvement (CMAQ) Program was implemented to support surface transportation projects and other related efforts that contribute air quality improvements and provide congestion relief.

FHWA - Federal Highway Administration - Within the US Department of Transportation, FHWA is responsible for highway issues, including federal laws and regulations related to metropolitan transportation planning.

FTA - Federal Transit Administration- within the US Department of Transportation, FTA is responsible for public transit issues, including federal laws and regulations related to metropolitan transportation planning.

FTA Section 5303 Funds - This program supports transit planning expenses to support cooperative, continuous, and comprehensive planning for making transportation investment decisions in metropolitan planning areas.

FTA Section 5310 - Transportation for Elderly Persons and Persons with Disabilities - The goal of the Section 5310 Program is to provide assistance in meeting the special transportation needs of elderly persons and persons with disabilities. The program is designed to supplement other FTA or assistance programs by funding transportation projects for elderly person and persons with disabilities in all areas – urbanized, small urban, and rural.

HSIP - Highway Safety Improvement Program - The overall purpose of this program is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads through the implementation of infrastructure-related highway safety improvements.

LRTP- Long Range Transportation Plan- Developed and approved by the MPO, the LRTP is a regional plan that includes all transportation projects and programs that the MPO realistically anticipates can be implemented over the next 25 years. LRTP's may include a VISION PLAN, which is a list of all projects (a "wish list"), but must also include a CLRP. In order to receive federal funding, transportation projects must be included in the LRTP and the TIP.

The FAST Act - On December 4, 2015, President Obama signed the Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94) into law—the first federal law in over a decade to provide long-term funding certainty for surface transportation infrastructure planning and investment. The FAST Act authorizes $305 billion over fiscal years 2016 through 2020 for highway, highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs. The FAST Act maintains our focus on safety, keeps intact the established structure of the various highway-related programs we manage, continues efforts to streamline project delivery and, for the first time, provides a dedicated source of federal dollars for freight projects. With the enactment of the FAST Act, states and local governments are now moving forward with critical transportation projects with the confidence that they will have a federal partner over the long term.

NHPP- National Highway Performance Program - The NHPP provides support for the condition and performance of the National Highway System (NHS), for the construction of new facilities on the NHS, and to ensure that investments of Federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a State's asset management plan for the NHS.

STP Funds – Surface Transportation Program funds are Federal Funds disbursed through State DOT's for Surface Transportation projects.

TAC- Technical Advisory Committee- Serves in an advisory capacity to the Policy Board of the MPO. The TAC works with MPO staff to formulate the UPWP, the LRTP, and provides technical review and assistance on numerous MPO projects undertaken as called out in the UPWP.

TIP - Transportation Improvement Program - Approved by the MPO Policy Board, it is a list of projects and programs that will be implemented over the next six years. In order to receive federal funding, transportation projects must be included in the Constrained Long Range Plan and the TIP. Amendments are major changes to a project included in the CLRP, TIP or STIP that are not Administrative Modifications.

UPWP – Unified Planning Work Program- MPOs must adopt and implement an annual work program and budget known as the Unified Planning Work Program (UPWP). The UPWP identifies all activities to be undertaken by the MPO during the fiscal year which begins July 1st and ends the following June 30th.

VDOT - Virginia Department of Transportation - Agency responsible for statewide transportation facility planning, construction, and maintenance. VDOT is separate from the Virginia Department of Rail and Public Transportation (VDRPT).

Back to Agenda

WinFred METROPOLITAN PLANNING ORGANIZATION

Frederick County ❖ City of Winchester ❖ Town of Stephens City

400 Kendrick Lane, Suite E, Front Royal, Virginia 22630
Phone: 540-636-8800
www.winfredmpo.org

Draft Technical Advisory Committee Minutes: December 4, 2018 @ 10 a.m.

Frederick County Administrative Offices
107 North Kent Street, Winchester, VA
First Floor Conference Room

Member Jurisdiction Representatives					
	Frederick County		**VDRPT**		**Staff**
	Patrick Barker		Ciara Williams	✓	Brandon Davis
	John Bishop		Todd Horsley	✓	John Madera
✓	Mike Ruddy		**Winchester Airport**	✓	Karen Taylor
✓	Jay Tibbs	✓	Nick Sabo	✓	Becky Sandretzky
	Stephens City		**Winchester Transit**		**Others**
	Mike Majher		Renee Wells	✓	Josh Janney, Winchester Star
	VDOT		**Winchester**		
✓	Terry Short		Perry Eisenach		
			Justin Hall		
	Non-Voting	✓	Tim Youmans		
	Mack Frost, FHWA		Shawn Hershberger		
	Tony Cho, FTA				
	Rusty Harrington, VA Dept. of Aviation				

Winchester Frederick County (WinFred) MPO
TECHNICAL ADVISORY COMMITTEE (TAC) Meeting
December 4, 2018 - 10:00 a.m.
Frederick County Administrative Offices - First Floor Conference Room
107 N. Kent Street, Winchester, VA

1. **Administrative Items:**
   a) Welcome and Introductions – Chairman Youmans welcomed everyone to the meeting.
   b) Review and approval of the November 6, 2018 Technical Advisory Committee Meeting Minutes – Motion to approve minutes made by Mr. Ruddy; seconded by Mr. Short. Motion carried.

2. **Public Comment Period –** None reported.

3. **TIP amendment for UPC 86316 – Terry Short, VDOT**

   Action: Recommend an amendment to change the project from NonMPO to MPO and add the CN: Bridge/Rehab grouping.

   Mr. Ruddy made a motion to recommend to the Policy Board an amendment to change the project from NonMPO to MPO and add the CN: Bridge/Rehab grouping for the TIP amendment for UPC 86316; seconded by Mr. Short. Motion Carried.

4. **2019 Safety Performance Targets – John Madera, WinFred MPO**

   The FHWA Safety Performance rulemaking requires MPOs to agree to contribute to meeting State DOT safety targets or to establish safety targets for each of five safety measures. By supporting any of the VDOT targets the MPO agrees to plan and program projects to contribute toward achieving the State target, and must not only consider safety, but increase the safety of the transportation system. Targets are updated annually.

   Action: Recommend MPO agreement to contribute to meeting VDOT's 2019 Safety Targets.

   Mr. Madera presented a PowerPoint presentation ***(attached)***

   Mr. Ruddy asked about the discussion that recently occurred regarding adoption of the state safety performance targets and asked how the two relate. Mr. Madera stated that approximately a year ago we went through the same exercise; the state safety targets are updated annually based on the trends. Mr. Davis explained that the topic discussed a few months ago focused on targets for asset condition and system performance. He said the process for adoption of those targets is similar that of the safety targets.

   Mr. Tibbs asked Mr. Short when he cited the fatalities in Frederick County at 22, if it was a straight count or a rate based on vehicle miles traveled; and given that our target is 7 fatalities for the whole MPO, are we being asked to cut our fatalities by two-thirds, and if that is realistic. Mr. Short explained that the number he cited was an annual count for Frederick County as a whole, and that the proposed target was for the MPO, which covers only part of the county.

   Mr. Ruddy made a recommendation to forward the 2019 Safety Performance Targets on to the Policy Board; seconded by Mr. Tibbs. Motion carried.

5. **North Winchester Area Study Phase 2 – Terry Short, VDOT**

The project consultant Kimley-Horn has submitted a scope and fee proposal for Phase 2.

Mr. Short gave a brief update on the North Winchester Area Study Phase 2. Phase 1, a carryover from the 2017 UPWP, covered a section of Route 11/Martinsburg Pike from the I-81 northbound off ramp to the vicinity of Old Charles Town Road to identify improvements that Frederick County subsequently made Smart Scale applications for, including the Red Bud Road realignment, an extension of the northbound acceleration lane at exit 317, and a roundabout at the Old Charles Town Road intersection. The Phase 2 Study will examine Routes 11 and 37 from the I-81 interchange to Lenoir Drive, to identify improvements ready for round 4 applications for Smart Scale. Mr. Short has been working with Mr. Madera and Kimley-Horn to develop a revised scope and fee of around $90,000. With a task order already in place, the Policy Board will be informed of TAC's consensus to advance this study.

6. **Upcoming Meeting Schedule (MPO Meetings are held at the Frederick County Administrative Offices):**
    - Project Steering Meeting: TBA
    - Policy Board: December 19, 2018
    - Technical Advisory Committee: January Meeting Cancelled

7. **VDOT/DRPT/Staff Updates**

Mr. Short gave an update on VDOT related items:

The Route 7 STARS Study framework document has been circulated to the Technical Advisory Committee and the Project Steering Committee. A requirement from STARS is that all stakeholders sign off on the framework scoping document, in order to initiate the notice to proceed for WSP to do the work. The counts have been done and an NTP has been issued.

As of December 4th, all Smart Scale Applications have been retained for the whole district.

The CTB meeting for this month will be an update on Interstate 81. Included is the funding recommendation for exits 313 through 317.

Mr. Sabo with the Winchester Regional Airport announced the Wings and Wheels event that will be held on June 1st.

8. **Other Business –** None reported.

Meeting adjourned at 11:00 a.m.

Definition of Acronyms on next page

Glossary of Acronyms

CAC- Citizen Advisory Committee- Serves as an advisory committee to the MPO Policy Board to solicit public input and provide citizen perspective on MPO projects. Conducts public hearings and public input sessions on selected projects at the direction of the Policy Board.

CLRP – Constrained Long Range Plan – A fiscally-constrained list of projects drawn from the Vision Plan element of the LRTP. All CLRP projects must have an estimated cost and a revenue source identified.

CMAQ- Congestion Mitigation and Air Quality Improvement (CMAQ) Program was implemented to support surface transportation projects and other related efforts that contribute air quality improvements and provide congestion relief.

FHWA - Federal Highway Administration - Within the US Department of Transportation, FHWA is responsible for highway issues, including federal laws and regulations related to metropolitan transportation planning.

FTA - Federal Transit Administration- within the US Department of Transportation, FTA is responsible for public transit issues, including federal laws and regulations related to metropolitan transportation planning.

FTA Section 5303 Funds - This program supports transit planning expenses to support cooperative, continuous, and comprehensive planning for making transportation investment decisions in metropolitan planning areas.

FTA Section 5310 - Transportation for Elderly Persons and Persons with Disabilities - The goal of the Section 5310 Program is to provide assistance in meeting the special transportation needs of elderly persons and persons with disabilities. The program is designed to supplement other FTA or assistance programs by funding transportation projects for elderly person and persons with disabilities in all areas – urbanized, small urban, and rural.

HSIP - Highway Safety Improvement Program - The overall purpose of this program is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads through the implementation of infrastructure-related highway safety improvements.

LRTP- Long Range Transportation Plan- Developed and approved by the MPO, the LRTP is a regional plan that includes all transportation projects and programs that the MPO realistically anticipates can be implemented over the next 25 years. LRTP's may include a VISION PLAN, which is a list of all projects (a "wish list"), but must also include a CLRP. In order to receive federal funding, transportation projects must be included in the LRTP and the TIP.

The FAST Act - On December 4, 2015, President Obama signed the Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94) into law—the first federal law in over a decade to provide long-term funding certainty for surface transportation infrastructure planning and investment. The FAST Act authorizes $305 billion over fiscal years 2016 through 2020 for highway, highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs. The FAST Act maintains our focus on safety, keeps intact the established structure of the various highway-related programs we manage, continues efforts to streamline project delivery and, for the first time, provides a dedicated source of federal dollars for freight projects. With the enactment of the FAST Act, states and local governments are now moving forward with critical transportation projects with the confidence that they will have a federal partner over the long term.

NHPP- National Highway Performance Program - The NHPP provides support for the condition and performance of the National Highway System (NHS), for the construction of new facilities on the NHS, and to ensure that investments of Federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a State's asset management plan for the NHS.

STP Funds – Surface Transportation Program funds are Federal Funds disbursed through State DOT's for Surface Transportation projects.

TAC- Technical Advisory Committee- Serves in an advisory capacity to the Policy Board of the MPO. The TAC works with MPO staff to formulate the UPWP, the LRTP, and provides technical review and assistance on numerous MPO projects undertaken as called out in the UPWP.

TIP - Transportation Improvement Program - Approved by the MPO Policy Board, it is a list of projects and programs that will be implemented over the next six years. In order to receive federal funding, transportation projects must be included in the Constrained Long Range Plan and the TIP. Amendments are major changes to a project included in the CLRP, TIP or STIP that are not Administrative Modifications.

UPWP – Unified Planning Work Program- MPOs must adopt and implement an annual work program and budget known as the Unified Planning Work Program (UPWP). The UPWP identifies all activities to be undertaken by the MPO during the fiscal year which begins July 1st and ends the following June 30th.

VDOT - Virginia Department of Transportation - Agency responsible for statewide transportation facility planning, construction, and maintenance. VDOT is separate from the Virginia Department of Rail and Public Transportation (VDRPT).

Proposed Methodology for WinFred MPO LRTP Project Prioritization

VDOT Staunton District Planning – November 2018

The WinFred MPO is preparing to amend its Long Range Transportation Plan (LRTP) to meet performance-based planning requirements set forth by the MAP-21 and FAST Acts. Scoping of the amendment will involve development of a performance-based prioritization process for projects in the 2040 LRTP Vision Plan. This memo details the prioritization methodology proposed by VDOT Staunton District Planning for the consideration of WinFred MPO staff. Given that there are roughly 120 projects in the Vision Plan, VDOT proposes a two-tiered screening plus prioritization process to economize staff efforts while providing a deep analysis of a core group of projects expected to be the most competitive in Smart Scale or other VDOT SYIP grant programs. This memo provides a detailed outline of the proposed process.

PROJECT SCREENING

The screening step uses a 10-point scale scoring method that considers a project's ability to address key performance areas and its magnitude of cost. VDOT proposes that screening be used to reduce the Vision Plan to roughly 20 projects to carry forward to the detailed evaluation and prioritization process. The performance categories and measures recommended for the screening step are summarized in the table below.

Performance Category	Proposed Performance Measure	Scoring
Congestion	Projects diverts traffic from or adds capacity to a congested roadway segment (volume-to-capacity ratio, V/C >= 0.8) under 2015 conditions in the WinFred MPO travel demand model	Yes = 2 pts No = 0 pts **(Max 2 pts)**
Multimodal Accessibility	Project includes pedestrian, bike, and/or transit mode component	2+ modes = 2 pts 1 mode = 1 pt 0 modes = 0 pts **(Max 2 pts)**
Safety	Project diverts traffic from or overlaps a roadway segment or intersection identified in VDOT's Potential for Safety Improvement (PSI) list	3+ PSI locations = 3 pts 2 PSI locations = 2 pts 1 PSI location = 1 pt 0 PSI locations = 0 pts **(Max 3 pts)**
Economic Development	Distance decay weighted quantity of 2015-2040 job growth adjacent to the project using assumptions in the WinFred MPO travel demand model	Top 1/3 = 3 pts Middle 1/3 = 1 pt Bottom 1/3 = 0 pts **(Max 3 pts)**
Magnitude of Cost	Planning level cost per mile multiplied by project length	**Divide by Cost**

The methodology for the economic development measure is the same in both the screening and the full scoring process and will be described in more detail in the project prioritization section below along with a definition of the potential for safety improvement (PSI) list. The other screening performance measures are assumed to be self-explanatory.

PROJECT PRIORITIZATION METRICS

The proposed project prioritization methodology is similar to the one successfully used for the HRMPO LRTP Amendment in 2018. Each performance measure is designed to either match or be a proxy to the methodology used by Smart Scale, with the intention being to approximate the most competitive projects within the MPO for state funding programs. Since much of the leg work to locate data sources & software tools, develop workable methodologies, and build scoring schemas has already been completed through the HRMPO project, the process for WinFred MPO will be less time consuming, though nonetheless a substantial work commitment. The proposed performance metrics are summarized below. Each performance metric is described in more detail in the following sections.

Smart Scale Scoring Measure (Category C Weight)	SMART SCALE Metric (Measure Weight)	Proposed Performance Metric (Measure Weight)
Congestion Mitigation (15%)	Reduction in person hours of delay, 2017 conditions **(100%)**	Reduction in network vehicle hours traveled (VHT) using WinFred MPO travel demand model, 2015 conditions **(100%)**
Safety (25%)	Reduction in equivalent property damage only (EPDO) of fatal and injury crashes **(50%)**	Rank-weighted sum of segments and intersections identified in VDOT's Potential for Safety Improvement (PSI) list **(100%)**
	Reduction in EPDO of fatal and injury crash rate **(50%)**	
Accessibility (25%)	Increase in average job accessibility per resident **(60%)**	Increase in average job accessibility per resident **(60%)**
	Increase in average job accessibility per resident for disadvantaged populations **(20%)**	Increase in average job accessibility per resident for disadvantaged populations **(20%)**
	Increase in access to multimodal travel choices **(20%)**	Increase in access to multimodal travel choices **(20%)**
Economic Development (25%)	Square feet of commercial/industrial development supported **(70%)**	Decay weighted job growth adjacent to project, 2015-2040 by TAZ **(70%)**
	Intermodal access and efficiency / tons of goods impacted **(30%)**	Intermodal access and efficiency/tons of goods impacted **(30%)**
Environmental Quality (10%)	Potential to improve air quality/ environmental effect **(50%)**	Potential to improve air quality/ environmental effect **(100%)**
	Natural and cultural resources scaled by potential acreage impacted **(50%)**	

CONGESTION MITIGATION (15%)

Proposed Metric (1 of 1):
Reduction in network vehicle hours traveled (VHT) using WinFred MPO travel demand model, 2015 conditions ***(100%)***

The Smart Scale congestion mitigation methodology uses a variety of customized tools, including FHWA's Capacity Analysis for Planning of Junctions (CAP-X) tool to measure changes in intersection volume to capacity ratio, the Bureau of Public Roads (BPR) volume-delay function to measure changes in roadway segment throughput, and an estimation method for the reduction in peak period non-SOV users based on transit/ped/bike/TDM project elements, all of which are consolidated into an expected reduction in peak hour person hours of delay under existing conditions (defined as 2017 for Smart Scale round 3). For projects involving a roadway on new location, the MPO travel demand model is used to substitute for the CAP-X and BPR tools. This Smart Scale methodology is unachievable at the VDOT district level since not all of the tools are available and the process is too involved for our labor resources.

The alternative methodology proposed is to use the WinFred MPO travel demand model to perform a before and after comparison of network vehicles hours traveled, which is a measure of the cumulative travel time for all vehicles on all roadways in the model. Most of the Vision Plan projects are new location roadways or major widening projects, both of which are well suited for the travel demand model since they are macroscopic in scale and may produce ripple effects in the transportation network that can be captured through vehicle routing adjustments. Smaller projects such as turn lanes and bike/ped facilities cannot be represented in our MPO's model. Since Smart Scale considers existing peak hour rather than future conditions, we propose the WinFred MPO model's base year 2015 PM peak period network be used for this analysis.

Congestion Mitigation **=** ***2015 PM peak period VHT BEFORE vs. AFTER project***

SAFETY (25%)

Proposed Metric (1 of 1):
Rank-weighted sum of segments and intersections identified in VDOT's Potential for Safety Improvement (PSI) list **(100%)**

Smart Scale uses detailed project scoping information and assigns crash modification factors (CMF) to each segment and intersection element, tallying the estimated reduction in number and rate of crashes based on 5 years of historical data. In the absence of detailed scoping for the WinFred MPO Vision Plan projects, an alternative methodology needs to be identified to score projects.

VDOT's Potential for Safety Improvement (PSI) list ranks the top roadway segments and intersections based on the magnitude of difference between the number of historical crashes at a given location and the expected number of crashes at that location based on statewide crash averages for similar facilities. VDOT calculates the expected number of crashes using considerations such as a roadway's functional classification, entering traffic volumes, and intersection control type. PSI lists are made available for segments and intersections in each VDOT District. The PSI segment and intersection PSI lists for Staunton District each contain a few hundred segments and intersections. This list of "top" locations is published for planning purposes to help state, regional, and local agencies prioritize safety projects. PSI is

somewhat relevant to Smart Scale in that project eligibility category uses PSI locations to identify locations having a safety need of any rank.

The proposed initial screening process assigns points to a project based on whether it diverts traffic from or overlaps a segment or intersection identified in VDOT Staunton District's PSI list. The proposed prioritization metric for safety asks this same question, but adds consideration for the ranking of the PSI segments and intersections effected by the project. The operating assumption for this process is that, if a project on existing alignment touches a PSI segment/intersection, then there is potential to improve conditions to address historical crash issues. For new location projects, diverting traffic away from a PSI location will reduce traffic volume and, therefore, is assumed to reduce crashes. Smart Scale makes this same assumption for new location facilities, except it uses a travel demand model to estimate diversion behavior and assigns CMFs based of the percent traffic reduced for all segments where there is a reduction in traffic >= 10%. *Since the proposed WinFred MPO process using PSI rankings is greatly simplified relative to that of Smart Scale and only assigns points to the most problematic locations rather than all historical crashes, a different diversion threshold for new location projects may be necessary to facilitate level comparison of existing vs. new location projects.*

The PSI dataset ranks segments and intersections separately, with rank 1 being the location with the greatest potential for safety improvement (i.e. - the location with the greatest positive deviation between actual crashes and expected crashes, or simply, the most problematic spot). It's necessary to bear in mind that these are lists of the *top* locations in the entire Staunton District, meaning they represent a few hundred locations out of thousands of existing intersections and roadway segments. All of these locations are important to some degree and the rankings exist to show which ones are the "worst of the worst".

Scoring of Effected PSI Segments

To perform project prioritization based on these ranked values, a custom methodology has to be developed. It's proposed that points be assigned to each rank in proportional reverse order, with rank 1 receiving the highest value and each successive rank being one value lower. For example, in a set of 250 PSI segments, one project that effects a rank 1 PSI segment would earn 250 points, while a second project effecting a rank 10 segment would earn 240 points, and a third project effecting a rank 300 segment would earn 1 point.

PSI segmentation is based on VDOT's roadway network system (RNS), which has inconsistent segment lengths. Because of this, a one mile Vision Plan project may touch multiple PSI segments in succession with varying ranks, or it may touch one longer segment with a single rank. To take location out of the picture, the proposed methodology assigns points to a project based only on the highest ranking PSI segment effected. This method also shows cognizance of the fact that the roadway typical sections and linear project elements that may address safety issues are likely to be the consistent across the entire length of that the project.

Scoring of Effected PSI Intersections

The segmentation issue described above does not apply for PSI intersections, as each intersection is evaluated as an independent, equally sized location. Also, while a project may have consistent treatments across multiple segments, project elements may vary from intersection to intersection to address the varying characteristics of each. Given these considerations, it's proposed that all PSI intersections effected by a project be tallied. To score intersections, the PSI intersection list is assigned points in reverse order to rank using the same process as the segments list.

Safety Metric Scoring Example

(Based on 250 PSI locations in segment & intersections datasets)

Project 1				**SCORE**	**202**
Segment effected	-				
Segment score					0
Intersections effected	49				
Intersection scores	202				202

Project 2				**SCORE**	**732**
Segment effected	2				
Segment score	249				249
Intersections effected	100	90	80		
Intersection scores	151	161	171		483

Project 3				**SCORE**	**455**
Segment effected	32				
Segment score	219				219
Intersections effected	15				
Intersection scores	236				236

Project 4				**SCORE**	**418**
Segment effected	238				
Segment score	13				13
Intersections effected	62	35			
Intersection scores	189	216			405

Project 5				**SCORE**	**481**
Segment effected	1				
Segment score	250				250
Intersections effected	20				
Intersection scores	231				231

Project	**Metric Score**
1	202
2	732
3	455
4	418
5	481

ACCESSIBILITY (15%)

Proposed Metric (1 of 3):

Change in average job accessibility per person ***(60%)***

The proposed methodologies for each of the three metrics of the accessibility measure closely match those described in the Smart Scale Technical Guide. Metrics 1 and 2 use the Citilabs Sugar Access tool, an extension for ESRI ArcGIS Desktop. The congestion analysis feeds the inputs for the accessibility analysis, with congested speed data for each roadway in the travel demand model's network effected by a given project being entered into Sugar Access for the no build and build conditions.

Excerpt from the Smart Scale Technical Guide:

> The GIS accessibility tool analyzes the existing average accessibility to jobs within 45 minutes per person at the individual U.S. Census block group level statewide... The jobs are weighted based on a travel time decay function, where jobs within a shorter travel time are weighted more than jobs farther away. The decay function was developed based on travel survey data. The average accessibility represents the total number of jobs reachable in a 45 minute travel time from each block group to every other block group.

Change in Job Access **=** ***Average # jobs accessible BEFORE vs. AFTER project***

Proposed Metric (2 of 3):
Change in average job accessibility per person for disadvantaged populations ***(20%)***

The calculation of accessibility for disadvantaged populations begins with the same methodology as above for general accessibility, except that instead of averaging for population as a whole, the accessibility is averaged for the disadvantaged population in each Census block. For the purposes of this analysis, "disadvantaged population" is defined as low-income, minority, or limited-English proficiency (LEP) residents. This is the same methodology as the one used for Smart Scale.

Proposed Metric (3 of 3):
Access to multimodal travel choices ***(20%)***

This metric considers the degree to which the project can increase access to non-single occupant vehicle travel options. The objective is to recognize projects that enhance connections between modes or create new connections. For scoring, a modified version of Table 8.2 in the Smart Scale Technical Guide is used, as seen below. Points from the qualitative questions will not be multiplied by the number of new peak period non-SOV users.

Table 8.2 Access to Multimodal Choices – Scoring Approach

Project Type (Mode) and Characteristics	Points (If Yes)
Project includes transit system improvements or reduces delay on a roadway with scheduled peak service of 1 transit vehicle per hour.	5
Project includes improvements to an existing or proposed park-and-ride lot. Ex. New lot, more spaces, entrance/exit, technology (payment, traveler information).	4
Project includes improvements to existing or new HOV/HOT lanes or ramps to HOV/HOT	2
Project includes construction or replacement of bike facilities. For bicycle projects, off-road or on-road buffered or clearly delineated facilities are required.	1.5
Project includes construction or replacement of pedestrian facilities. For pedestrian projects, sidewalks, pedestrian signals, marked crosswalks, refuge islands, and other treatments are required (as appropriate).	1.5
Project provides real-time traveler information or wayfinding specifically for intermodal connections (access to transit station or park&ride lot).	1
Provides traveler information or is directly linked to an existing TMC network/ITS architecture.	1
Total Points Possible	**5 points maximum**
~~Measure Scaling: Points are multiplied by the number of new peak period non-SOV users~~	

ECONOMIC DEVELOPMENT (25%)

Proposed Metric (1 of 2):
Decay weighted job growth adjacent to project, 2015-2040 by TAZ ***(70%)***

The proposed metric for effect on economic development scores projects based on the distance decay weighted quantity of 2015-2040 job growth adjacent to the project per the TAZ-level land use assumptions made by localities in the WinFred MPO travel demand model. Job growth occurring closer to the transportation project is given higher weight than growth occurring farther from the project. Distance weighting is accomplished using concentric ringed buffers that approximate the buffer distances seen in the Smart Scale Technical Guide Table 10.3, inserted below, except jobs are used with this method as opposed to economic development site building square footage.

Table 10.3 Buffer Distance by Project Type and Adjustment for Provision of Access

Buffer Distance to Determine Total Square Footage	Applicable Project Types
Tier 1 Project Type – 0.5 mile buffer	Turn Lane, Intelligent Transportation Systems, Bike Lane or Path, Sidewalk, Bus Stop, Park & Ride Lot
Tier 2 Project Type – 1 mile buffer	Access Management, Signal optimization, Increase Bus service, Improvement to Rail Transit Station
Tier 3 Project Type – 3 mile buffer	New through lane, new/improved interchange, new bridge, new Rail Transit Station, additional Rail Track
Access Provision Adjustment per Site within Buffer	
Project provides new direct access to the site or improves existing access to the site (site must be physically adjacent to the project). In case of capacity enhancement to limited access facility, new or improved interchange, transit rail capacity improvement, or new transit rail station zoned properties within 0.5 miles of the adjacent interchange(s) or rail station(s) qualify as receiving improved direct access.	Project enhances economic development by improving congestion, mobility, access, or operations in the vicinity of the site but the site is not physically adjacent to the project
Multiply by 1	Multiply by 0.5

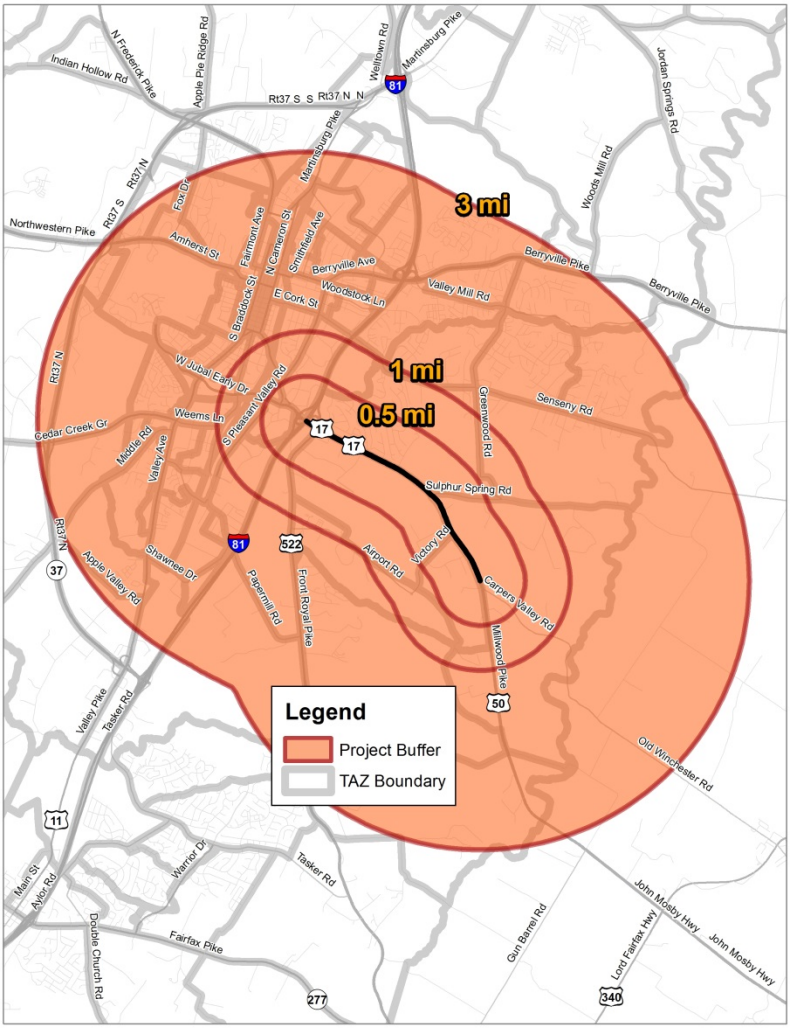
* buffer distance is measured via the travel distance on the transportation network

The maximum buffer size is determined using the first portion of the table above. Next, the proposed buffers below are created around the linear project area to decay weight job growth by proximity. The distance weights selected serve as a proxy for the direct vs. indirect access provision and driving distance modifiers used in Smart Scale for economic development sites, as seen in the lower portion of Table 10.3 above. The proposed distance decay weighting is in the table below.

Proposed Distance Decay Weighting of Job Growth	
Buffer Distance	**% Job Growth Counted**
>= 0.5 miles	100%
> 0.5 and <= 1 mile	50%
> 1 mile to 3 miles	25%

The map below gives an example of how these concentric buffers would look for a widening project on Route 50/17. Seen in wide gray boundaries on the map are TAZ boundaries. In most cases, a given buffer will only overlap a portion of a TAZ. Also, a single TAZ may be covered by multiple buffers. To account for these geographic mismatches, the percent of a TAZ that's overlapped by a given buffer will be determined and the job growth for that TAZ multiplied by the percent coverage. For example, a TAZ having a job growth of 500 is overlapped 50% by the 1-3 mile buffer with 25% weighting. To determine the job growth for that zone within the 1-3 mile buffer, the following calculation is performed: 500 jobs x 50% coverage area x 25% weighting = 62.5 jobs. Jobs for each TAZ are summed to reach a total project score.

Example Job Growth Buffers for a Route 50/17 Widening Project



Proposed Metric (2 of 2):

Intermodal access and efficiency/tons of goods impacted ***(30%)***

The proposed intermodal access metric closely matches the Smart Scale Technical Guide. Table 10.5 is copied below to demonstrate how scoring for this metric occurs. Per the Technical Guide, points tallied using Table 10.5 are multiplied (scaled) by total freight tonnage within the project corridor and by the total length of the proposed roadway project contributing to the operational benefit to freight movement.

Table 10.5 Intermodal Access and Efficiency – Scoring Approach

Rating Description	Value
1. Level to which the project enhances access to existing or planned distribution centers, intermodal transfer facilities (excluding ports and airports), manufacturing industries or other freight intensive industries	
Project provides direct access (within 1 mile) to existing or planned locations	2
Project provides indirect access (greater than 1 mile, less than 3 miles) to existing or planned locations	1
No direct or indirect access	0
2. Level which the project supports enhanced efficiency on a primary truck freight route	
Project is on the designated STAA National and Virginia Network or a STAA Virginia Access Route[10]	2
Project directly connects to designated STAA National and Virginia Network or a STAA Virginia Access Routes	1
Project is not on and does not connect to the designated STAA National and Virginia Network	0
3. Level to which the project enhances access or reduces congestion at or adjacent to Virginia ports or airports	
Project provides direct access to (within 1 mile) existing or planned ports or airports (measured from designated entry gates to port or air cargo facilities)	2
Project provides indirect access to (greater than 1 mile, less than 3 miles) existing or planned ports or airports (measured from designated entry gates to port or air cargo facilities)	1
No direct or indirect access	0
Total (sum of score)	**0 – 6**

ENVIRONMENTAL QUALITY (10%)

Proposed Metric (1 of 1):

Potential to improve air quality/environmental effect ***(100%)***

The environmental quality metric scoring methodology follows Table 9.2 in the Smart Scale Technical Guide, which assigns points for non-SOV and freight transportation project characteristics. This table is pasted below for reference. For the proposed WinFred MPO prioritization, the measure scaling described at the bottom of Table 9.2 is omitted due to limitations in evaluation tools at the district level.

Table 9.2 E.1 Air Quality and Energy Environmental Effect – Scoring Approach

Project Type (Mode) and Characteristics	Points (If Yes)
Non-SOV Project Characteristics	
Project includes improvements to rail transit or passenger rail facilities.*	3
Project includes construction or replacement of bike facilities. For bicycle projects, off-road or on-road buffered or clearly delineated facilities are required.*	2
Project includes construction or replacement of pedestrian facilities. For pedestrian projects, sidewalks, pedestrian signals, marked crosswalks, refuge islands, and other treatments are required (as appropriate).*	2
Project includes improvements to an existing or proposed park-and-ride lot. Ex. New lot, more spaces, entrance/exit, technology (payment, traveler information).*	2
Project includes bus facility improvements or reduces delay on a roadway with scheduled peak service of 1 transit vehicle per hour.*	1
Project include special accommodations for hybrid or electric vehicles, or space or infrastructure for electric vehicle parking/charging).*	0.5
Project includes energy efficient infrastructure or fleets, including: hybrid or electric buses, electronic/open road tolling, alternative energy infrastructure (e.g., roadside solar panels).*	0.5
Total Points Possible	**8.5 points maximum***
Measure Scaling: *Points are multiplied by the number of peak period non-SOV users.	
Freight Transportation Project Characteristics	**Points (If Yes)**
Project reduces traffic delay at a congested intersection, interchange, or other bottleneck with a high percentage of truck traffic (greater than 8 percent of AADT). ***	1
Project includes improvements to freight rail network or intermodal (truck to rail) facilities/ports/terminals.**	0.5
Total Points Possible	**1.5 points maximum****
Measure Scaling: **Points are multiplied by daily truck volumes. ** Points awarded for projects with a decrease in person hour delay greater than zero and with truck traffic greater than 8% AADT	

PROJECT SCORING

The proposed scoring process is summarized in this section. More detailed examples of this process can be found in Section 4.5 of the Smart Scale Technical Guide.

NORMALIZATION

The proposed methodology uses the Smart Scale normalization procedure for each performance metric in which the highest scoring project in a given metric is assigned 100/100 possible points, then the scores for all other projects are calculated based on their score as a percentage of the high score.

Next, the weighting for each metric is applied (e.g. – change in average job accessibility, which is 70% of Accessibility measure) and an overall value is calculated for each scoring measure (e.g. – accessibility, congestion, etc. – AKA "factors" in Smart Scale). Finally, the scoring measure, or factor, weights are applied (e.g. – accessibility is weighted at 25%) to arrive at the project benefit score.

It's important to bear in mind that this process normalizes scores based on the pool of projects being considered. Benefit scores calculated through this process are not comparable to projects submitted in Smart Scale because we are comparing WinFred MPO projects to themselves and not to a statewide pool of Smart Scale applications.

FACTORING IN PROJECT COST

Project cost is a crucial component in the prioritization process. In the absence of funding consideration, there is no relationship between the benefits provided by a project and the cost required to achieve that benefit. For example, a mega project may rank at the top of the prioritized list if only the benefit score is considered because it makes large scale improvements, but that project could easily slide to the bottom of the list if the price tag far exceeds that of other projects relative to the benefit provided. It's proposed that WinFred MPO use the Smart Scale method for factoring in cost, in which a project's benefit score is divided by the project's cost in $10 millions (e.g. – a $5 million project would have its benefit score divided by 10/5 = 2). This produces a final project score for prioritization.

Project cost estimates will be developed using the VDOT TMPD Cost Estimating Worksheet. Inflation to a 2025 year of expenditure will be used to match the anticipated year of funding release for projects awarded in Smart Scale round 4.

WORK PLAN

At least two dedicated personnel should be committed to the project to work in tandem and QA/QC one another's work. A suggested allocation of responsibilities is laid out in the two tables below.

PROJECT SCREENING STEP

Performance Category	Proposed Performance Measure	Responsible Agency
Congestion	Projects diverts traffic from or adds capacity to a congested roadway segment (volume-to-capacity ratio, V/C >= 0.8) under 2015 conditions in the WinFred MPO travel demand model	VDOT
Multimodal Accessibility	Project includes pedestrian, bike, and/or transit mode component	WinFred MPO
Safety	Project diverts traffic from or overlaps a roadway segment or intersection identified in VDOT's Potential for Safety Improvement (PSI) list	WinFred MPO
Economic Development	Distance decay weighted quantity of 2015-2040 job growth adjacent to the project using assumptions in the WinFred MPO travel demand model	VDOT
Magnitude of Cost	Planning level cost per mile multiplied by project length	VDOT

PROJECT PRIORITIZATION STEP

Smart Scale Scoring Measure (Category C Weight)	Proposed Performance Metric (Measure Weight)	Responsible Agency
Congestion Mitigation (15%)	Reduction in network vehicle hours traveled (VHT) using WinFred MPO travel demand model, 2015 conditions **(100%)**	VDOT
Safety (25%)	Rank-weighted sum of segments and intersections identified in VDOT's Potential for Safety Improvement (PSI) list **(100%)**	WinFred MPO
Accessibility (25%)	Increase in average job accessibility per resident **(60%)**	VDOT
	Increase in average job accessibility per resident for disadvantaged populations **(20%)**	VDOT
	Increase in access to multimodal travel choices **(20%)**	WinFred MPO
Economic Development (25%)	Decay weighted job growth adjacent to project, 2015-2040 by TAZ **(70%)**	VDOT
	Intermodal access and efficiency/tons of goods impacted **(30%)**	WinFred MPO
Environmental Quality (10%)	Potential to improve air quality/ environmental effect **(100%)**	WinFred MPO
Planning Level Cost Estimates	TMPD Cost Estimating Worksheet	VDOT