Virginia’s Prioritization Process
Implementing SMART SCALE

Transportation for America
Massachusetts Transportation Leadership Academy
December 12, 2017
Overview

• Developing a prioritization process for Virginia
  – State legislation and bi-partisan support
  – General framework
  – Integration of planning and programming

• Applications process
  – Who can apply
  – Eligibility

• Project evaluation and scoring
  – Factors and weighting
  – Scoring
  – Measures and methodologies

• Lessons Learned
Building the Foundation for SMART SCALE
Virginia’s Statewide Prioritization Process

- Legislation championed by Democratic Governor and the Republican Speaker of the House
  - 2014 Virginia General Assembly
  - §33.1 – 23.5:5 of the Code of Virginia

- Requires Commonwealth Transportation Board (CTB) use objective and quantifiable process for the allocation of construction funds
  - Board allocates construction funds for the Commonwealth
  - Programming of funds for capacity enhancing projects
  - Intent for the CTB to select the highest ranking projects however, they maintain the authority to propose adjustments to the rankings.

- Policy developed over a 16 month period and adopted by Commonwealth Transportation Board in June 2015
Candidate projects are screened to determine if they qualify to be scored.

All projects by law are evaluated using the following factors:

- Safety
- Congestion mitigation
- Accessibility
- Land Use (only in areas over 200,000)
- Economic development
- Environmental Quality
Three Key Goals

Established goals for successful implementation:
• Promote performance in the selection of projects
• Provide stability to the Six-Year Improvement Program
• Establish project pipeline that links planning to programming

Board direction:
• Simple and straightforward
• Does not require applicants to invest significant time and resources or require the use of consultants
• VDOT and DRPT staff will be available to provide support and tools for applicants in compiling data and information needed for application
• The application process will be electronic and map-based to facilitate automated population of key data elements
Context for Reform

- Legislature enacted significant transportation revenue package in 2013
- Desire by lawmakers to demonstrate to public the benefits from new taxes
- Decision-making process was opaque in the sense that it was driven by politics
- Lawmakers and stakeholders concerned that state was not advancing projects that addressed the more urgent needs
- Governor McAuliffe campaigned on reforming transportation to ‘pick the right projects, build the best ones’
Political Support is Critical

Keys to Political Support

- Broad based evaluation – something for everyone
- Recognizes that different parts of the state have different needs
- Mode-neutral
- Legislature controlled by opposite party of Administration
- Did not impact fully-funded projects
- Provide transparency in the process
- Deliver! Demonstrate effective and efficient use of funding by delivering on time and on budget
Concerns of State and Local Officials

- ‘All the funds will all go to Northern Virginia’
- ‘Rural areas will lose out in this process’
- ‘My region pays taxes and has transportation needs’
- ‘Prioritization should be done at a regional level, not a statewide level’
- ‘Politics will still drive this process – I do not think this is going to change anything’
Public Engagement is Critical

- 27 Commonwealth Transportation Board public hearings across the state
- Stakeholder session in every construction district
- Individual meetings with every Metropolitan Planning Organization (MPO)
- Numerous presentations at stakeholder and association conferences
- Developed Stakeholder Communication Plan and Public Engagement Plan
- www.smartscale.org
Guiding Principles for Measures

• Analyze what matters to people and has a meaningful impact
• Look at benefits relative to cost
• Transparent and understandable
• Must work for both urban and rural areas
• Must work for all modes of transportation
• Minimize overlap in measures
• Researched best practices from other state DOTs and MPOs
• Secretary established an Executive Work Group to oversee implementation
• Established sub-work groups focused specifically on policy, measures and the online portal
• Held peer exchange workshop
• Held outreach meetings with key stakeholders
• Surveyed stakeholders
• Pilot project evaluation brought before the Board
Reformed Funding Formulas

• In 2015 legislature adopted Administration’s recommended revisions to funding formulas
  – Amend and reenact § 33.2-358 which established the highway allocation formula for the $500 million CTB annual allocation
• Runs all state and federal construction revenues, excluding specialized programs, through formula
• After capital rehabilitation and reconstruction
  – 50% of funds distributed at statewide-level based on prioritization process
  – 50% of funds set-aside for districts based on formula and then distributed within the district using prioritization process
The team successfully developed and implemented what is likely the most transformative transportation legislation in Virginia the last 30 years.

• Improved transparency
• Enhanced accountability
• Better certainty for project sponsors and business community
• Project design focused on achieving most benefits for the least cost
• Provides political cover to allow planning and programming to proceed without intervention
Impact of SMART SCALE to Project Development

• Stronger and more thorough project planning
  – Planning before capital improvement program

• Project Scopes and Estimates – focusing scope on problem/needs – trimming the fat
  – Re-evaluating solutions to problems
  – Evaluate whether identified need can be addressed through operational improvements or TDM
  – Evaluate current scope to determine if there are components that do not address identified need(s)
  – Evaluate current scope to determine whether design can be modified or design exceptions utilized to reduce costs

• Thinking beyond SOVs – opportunities for bike/ped, transit, TDM
Impact of SMART SCALE to Program Development

- Strong link between planning and programming
- Paradigm shift for how projects are selected for funding
- Increased stability in the SYIP
- Shift from a top down approach to a bottom up approach to transportation - VDOT/DRPT cannot submit projects
- Projects are no longer partially funded - projects selected for funding will be fully funded through construction
- Stronger role for CTB members - can only be removed for cause
Increased Transparency
Group Discussion
Integrating into the planning and programming processes
Life Cycle of a Candidate Project

- How it’s planned.
- MPO CLRPs
- Corridor Studies
- STARS program
- Local Comp Plans

How it’s scored.
- VTrans 2040
- SMART SCALE

How it’s funded.
- District Grant
- High-Priority

SMART SCALE: Funding the Right Transportation Projects in Virginia
• VTrans is the long-range, statewide multimodal policy plan - Vision and Goals for transportation in the Commonwealth

• VTrans2040 serves two functions and produces two independent, but connected documents:
  • 25 year vision document
  • Multimodal Transportation Plan (VMTP) includes Multimodal Needs Assessment
How are projects filtered?

Project must meet a need identified in VTrans to be eligible

www.vtrans.org
Note: Map includes all locally designated growth areas that appear consistent with the intent of 15.2-2223.1. OIPI is asking that localities who want their growth areas to qualify for HB2 funding to add a code reference (15.2-2223.1) by October 1, 2015 to ensure that projects submitted to promote these areas meet the HB2 screening requirement. Projects promoting UDA-like designated growth areas with the proper code reference submitted after October 1 will not be considered in the first round of HB2 project screening.
Virginia CoSS

- A Coastal Corridor (Route 17)
- B Crescent Corridor (I-64)
- C East-West Corridor (I-64)
- D Eastern Shore Corridor (Route 13)
- E Heartland Corridor (US 460)
- F North Carolina to West Virginia Corridor (Route 220)
- G North-South Corridor (New)
- H Northern Virginia Corridor (I-66)
- I Seminole Corridor (Route 28)
- J Southside Corridor (Route 58)
- K Washington to North Carolina Corridor (I-95)
- L West Mountain Corridor (I-77)
Regional Networks

Defined as:

- Jurisdictions that are included either in whole or in part within MPO Planning Area Boundaries
- Any additional element of the transportation system that is connected to the MPO area and deemed critical to the MPO
Urban Development Areas (UDAs)

Areas voluntarily designated by local governments as prime areas for future economic growth pursuant to 15.2-2223.1

- Must reflect transportation-efficient land use principles including
  - Mixed-use land use
  - Interconnected streets
  - Moderately compact growth
• Safety needs based on the top 100 intersections and segments identified based on PSI, Potential for Safety Improvement, in each district

• PSI score is the number of serious or fatal crashes minus the predicted rate for that type/volume roadway

https://www.google.com/maps/d/u/0/viewer?mid=1mQGiz1QQWRJ0T3HEVUiiDGS9dLQ
First round of projects – FY2016-2022 Six-Year Improvement Program Update

$500M for High Priority Projects
  • Locally or Regionally submitted projects compete statewide

$500M for Construction District Grant Projects
  • Formula driven distribution to 9 construction districts
  • Locally submitted projects compete within each district
Group Discussion
Q&A
SMART SCALE
Application Process
<table>
<thead>
<tr>
<th>Project System</th>
<th>Regional Entity (MPOs, PDCs)</th>
<th>Locality* (Counties, Cities, Towns)</th>
<th>Public Transit Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corridor of Statewide Significance</td>
<td>Yes</td>
<td>Yes, with a resolution of support from relevant regional entity</td>
<td>Yes, with resolution of support from relevant regional entity</td>
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<tr>
<td>Regional Network</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, with resolution of support from relevant entity</td>
</tr>
<tr>
<td>Urban Development Area</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

* Localities are also eligible to submit projects addressing a safety need identified in VTrans 2040 under the Construction District Grant Program
How do they submit an application?
Welcome to SMART PORTAL

The SMART Portal Application Tool provides public access to applications that have been submitted for funding for transportation and the Department of Rail and Public Transportation. These programs include SMART, Highway Safety Improvement Program (HSIP), Bike Fix It Fund (BFS), Systematic Safety Improvement (SSI), Rail Safety Improvement Program (RSIP) and more. To find out more information about each application program click on the About tab.

After each round of application submission and scoring, the tool provides public view of the individual applications. This includes screened out applications that may be selected for resubmission in a future round. Each project application is associated with multiple filter options, including the identification of projects selected for funding in the Six-Year Improvement Program.

All submitted project applications will be subject to requirements of the Freedom of Information Act (FOIA).

If you need assistance with this site, send your requests to SmartPortal@CTB.Virginia.gov.
All grant request applications managed in one system
Use the mapping tool below to locate your project area(s).

Zoom in to the project location, then click "Add Project Area". Then draw a polygon around your project area by clicking on the map. While drawing, you can click and hold mouse button to pan around the map. Double-clicking will complete the polygon. Please be sure to draw your polygon as close to the project footprint as possible. You can add additional polygons by clicking the "Add Project Area" button. To remove a polygon, click on the polygon, then click the "Remove Project Area" button. Note: Internet Explorer 9 only allows 30 points per polygon.

Areas Served

PDCs Served
- Roanoke Valley-Alleghany
- Regional Commission
- Central Shenandoah
- Region 2000

MPOs Served
- Lynchburg Area MPO

Jurisdictions Served
- Alleghany County
- Bedford County
- Botetourt County
- Craig County
- Rockbridge County

Districts Served
- Salem
- Staunton
SMART SCALE Validation and Screening
• Focus on the following:
  – Project Eligibility
    ▪ Studies not allowed
    ▪ Project must be capital improvement, demand management or safety project
    ▪ State of Good Repair projects not allowed
  – Scope and Budget
  – Project Readiness
    ▪ Projects must be sufficiently developed such that benefits can be calculated
  – SMART SCALE Factors
    ▪ Scoring items that applicant provides in the following categories – 1) Accessibility, 2) Environment, 3) Economic Development and 4) Land Use and Transportation Coordination (Area Types A and B only)

• Application Changes
  – Utilized portal to document changes between applicant submitted application and State recommended changes
  – Applicant concurrence of changes documented
Screening/Eligibility Process

- High Priority Projects – Project must meet a need identified for
  - Corridor of Statewide Significance
  - Regional Network
- Construction District Grant Programs – Project must meet a need identified for
  - Corridor Statewide Significance
  - Regional Network
  - Urban Development Area
  - Safety
- Projects must meet eligibility requirements
  - must be a capacity, operational, TDM or safety improvement
  - must be developed sufficiently such that benefits can be calculated
  - must have a preferred alternative
Group Discussion
Q&A
SMART SCALE Measures and Scoring
SMART Scale Factors

- Safety
- Congestion mitigation
- Accessibility
- Environmental quality
- Economic development
- Land use and transportation coordination (areas with over 200,000 people)
Factor Areas
Goals that guided measure development

- **Safety** – reduce the number and rate of fatalities and severe injuries
- **Congestion** – reduce person hours of delay and increase person throughput
- **Accessibility** – increase access to jobs and travel options
- **Economic Development** – support economic development and improve goods movement
- **Environmental Quality** – improve air quality and avoid impacts to the natural environment
- **Land Use** – support transportation efficient land development patterns
How Scoring Works

Everything is Relative
Everything is Relative

<table>
<thead>
<tr>
<th>Project</th>
<th>Measure</th>
<th>Score</th>
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<td>A</td>
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<td>B</td>
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<td>C</td>
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<td>D</td>
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<td>E</td>
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<tr>
<td>F</td>
<td>150</td>
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</table>

The best project for that measure dictates the score for all other projects.

**Highest Value Dictates Scores**

<table>
<thead>
<tr>
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**Change here only affects one score**

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**Change here affects all scores**
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<tr>
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<tr>
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### Sample Project Scoring

**Project "A" - located in Typology A**

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<table>
<thead>
<tr>
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<td>Total Project Cost</td>
<td>$20,000,000</td>
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<tr>
<td>Score Divided by Total Cost</td>
<td>17.95</td>
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<tr>
<td>HB2 Cost</td>
<td>$10,000,000</td>
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<tr>
<td>Score Divided by HB2 Cost</td>
<td>35.9</td>
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</table>
How does cost affect the score?

- SMART SCALE requires that benefits produced by a project be analyzed on a basis of relative costs.
- Results to be provided to Commonwealth Transportation Board based on:
  - Benefits relative to SMART SCALE cost
  - Benefits relative to total cost
Why benefit/$ is important

Raw Benefit Score

SMART SCALE
Funding the Right Transportation Projects in Virginia

- 66 HOT Lanes
- I-64 Widening
- I-95 Decel Lane
- ART Bus Route
Why benefit/$ is important

Project Cost (requested amount)
Why benefit/$ is important
Rethinking how we solve transportation problems

SMART SCALE
Common Sense Engineering
Arterial Preservation and Innovative Intersections
Common Thread
Focused Cost Effective Solutions

Office of the Secretary of Transportation
Why Cost Effectiveness Matters

Opportunity Costs

Fleet Manager Analogy
Objective: Increase fuel efficiency of 100 vehicle fleet
Budget: $100,000

Strategy 1
Replace 2 vehicles with electric vehicles at cost of $50,000 each

Strategy 2
Invest $1000 in each vehicle in fleet to improve fuel efficiency of each vehicle by 10%
- New gas saver tires
- Vehicle tuning chip
- High efficiency air filters
Why Cost Effectiveness Matters

Opportunity Costs

Scenario Comparison
Objective: Reduce congestion and improve safety along corridor with 10 signalized intersections

Strategy 1
Widen corridor by one lane in each direction for $90,000,000

Strategy 2
Convert entire corridor to Superstreet and install adaptive signal controllers and transit signal priority for $30,000,000
Transportation as a System

- Peak hour queuing
- Grade separate for $65M
- Bottleneck transfers to next signal
Transportation as a System

Innovative intersection treatments at all 4 signals to improve throughput and reduce conflict points - $3-$5M per intersection

Peak hour queuing

Improved performance along corridor - savings can be used to solve problems on other corridors
Measures used to calculate project benefits
Measuring SAFETY

- 50% of score – Expected reduction in Equivalent Property Damage Only (EPDO) crash frequency (100% of score for transit projects)

- 50% of score – Expected reduction in Equivalent Property Damage Only (EPDO) crash rate

<table>
<thead>
<tr>
<th>Factor</th>
<th>Congestion Mitigation</th>
<th>Economic Development</th>
<th>Accessibility</th>
<th>Safety</th>
<th>Environmental Quality</th>
<th>Land Use</th>
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</thead>
<tbody>
<tr>
<td>Category A</td>
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<td>10%</td>
</tr>
<tr>
<td>Category C</td>
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<tr>
<td>Category D</td>
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<td>35%</td>
<td>15%</td>
<td>30%</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>
• Highway Projects
  • Compile fatal/injury crash data for project limits (5 years)
  • Segment project for safety analysis (segments and nodes)
  • Convert crashes to EPDO
    ▪ Weights
      – Fatal (K) - 540
      – Severe Injury (A) - 30
      – Minor Injury (B) - 10
      – Non-visible injury (C) - 5
  • Based on project scope select Crash Modification Factor(s)
  • Use CMF(s) to calculate reduction in crashes and rate
How a CMF works

- \# of crashes before project \* CMF = number of crashes expected to remain after project
- Lower number is better - CMF of 0.20 means 80% of crashes are expected to be eliminated
For list of planning level Crash Modification Factors used in SMART SCALE please visit the SMART SCALE Resources page - [http://smartscale.org/resources/default.asp](http://smartscale.org/resources/default.asp)

Link under safety - [http://smartscale.org/documents/hb2_planning_level_cmfs_201508_final.pdf](http://smartscale.org/documents/hb2_planning_level_cmfs_201508_final.pdf)

<table>
<thead>
<tr>
<th>Project Extent</th>
<th>Improvement Type/Features</th>
<th>Planning Level CMF</th>
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</thead>
<tbody>
<tr>
<td>Intersections</td>
<td>Turn Lane(s)</td>
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<tr>
<td></td>
<td>New Turn Lane (none present)</td>
<td>0.85</td>
</tr>
<tr>
<td></td>
<td>Add Turn Lane (to existing)</td>
<td>0.97</td>
</tr>
<tr>
<td></td>
<td>Extend Turn Lane</td>
<td>0.97</td>
</tr>
<tr>
<td></td>
<td>Remove Minor Approach Left Turns (use right turn and downstream U-turn)</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td>Improve skew angle</td>
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<td>3 Leg Intersection</td>
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<td>4 Leg Intersection</td>
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<tr>
<td></td>
<td>Increase intersection radii</td>
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</table>
Safety - How

• Transit*/Travel Demand Management/New Location
  • Identify corridor(s) served
  • Compile fatal/injury crash data for project limits (5 years)
  • Convert crashes to EPDO
  • Use ridership/volume reduction to calculate reduction in VMT
  • Use VMT reduction to calculate crash reduction
  • *Transit - Fatal and Injury frequency weighted at 100%
Safety Measures
Proposed Changes for Next Round

• Many fatalities and severe injuries are the result of factors unrelated to roadway design

• Vehicle age and age of occupants plays a major role in determining whether a crash results in a fatality or severe injury
  – Statistics from 2013 NHTSA Report
    ▪ 71% more likely to die if car is 18+ years old
    ▪ 50% more likely to die if car is 15-17 years old
  – 2012 AAA Traffic Safety Report
    ▪ Deaths per 100 million VMT decrease from age 16 until age 60 then it increases sharply (survivability)

• Current methodology weights fatalities 18x greater than severe injuries
Safety Measures
Proposed Changes for Next Round

• Roadway improvements often cannot address crashes resulting from driving under the influence

• Have had a project recommended for funding due to single crash over 5-year period that involved alcohol

• Remove crashes that are the result of driving under the influence from consideration in scoring
Safety Measures
Proposed Changes for Next Round

• Difference between fatality and severe injury often related to age of vehicle and age of occupant

• Many states used a ‘blended’ value for fatalities and severe injuries

• Recommend the use of a ‘blended’ weighting for SMART SCALE similar to other states in Round 3 scoring
# Safety Measures

## Use of *Reduced* and *Blended* Rates

<table>
<thead>
<tr>
<th>Agency</th>
<th>Fatal Injury (K)</th>
<th>Incapacitating injury (A)</th>
<th>Moderate Injury (B)</th>
<th>Minor Injury (C)</th>
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<td>Virginia Smartscale</td>
<td>540</td>
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</table>
Encouraging Access Management

Poor Access Management

Good Access Management
Encouraging Alternative Intersections

- Divergent Diamond
- Superstreet
- Jug Handle
- Continuous Flow Intersection
- Quadrant Roadway Intersection
Rural Application - US 17 in Leland, NC

55% decrease in Fatal and Injury crashes

Superstreets can be implemented without signals
Urban Application - US 281 in San Antonio, TX

- Loons to facilitate U-turns
- 53% decrease in travel time
Measuring CONGESTION MITIGATION

– 50% of score – Change in peak period (multimodal) person throughput in the project corridor

– 50% of score - Change in the amount of peak period person hours of delay in the project corridor

<table>
<thead>
<tr>
<th>Factor</th>
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<td>10%</td>
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</tbody>
</table>
Congestion – How Person Throughput

• Highway Projects
  • Volume to Capacity ratio for each segment and intersection calculated for peak hour
  • Calculate volume above capacity now being served by improvement – convert to person throughput
  • Select lowest increase in throughput from all components
  • Apply expansion factor to account for peak period – based on INRIX Travel Time Index (TTI)

• Transit/Travel Demand Management
  • Identify corridor served
  • Determine peak period ridership/volume reduction (Throughput A)
  • Using process above for highways, calculate additional vehicle demand that can now be served based on transit diversion in corridor served (Throughput B)
  • Add together to get total person throughput
Highway Projects (Existing)
- Delay for each segment and intersection calculated for peak hour
- Sum delay reduction (up to posted speed limit) and convert to person hours
- Apply expansion factor to account for peak period

Transit/Travel Demand Management
- Identify corridor served
- Determine peak period ridership/volume reduction
- Using process above for segments, calculate reduction in person hours

Method only calculates delay savings up to posted speed limit
Congestion – How Adjusting Volume to Capacity

Before Speed

No build

V/C

Transit, P&R

After Speed

Build

Capacity Improvement

V/C

Smart Scale Funding the Right Transportation Projects in Virginia
• Projects that have impacts to regional travel patterns and require the use of travel demand model in congestion evaluation:
  – Major widenings of interstates (addition of one or more travel lanes) over two miles in length
  – New location facilities
  – Combination projects (widening and new location)
• Inputs
  – Number of lanes
  – Design speed
  – Proposed functional classification
• Assumptions
  – Vehicle occupancy rate is held constant statewide- 1.54 persons per vehicle based on National Household Travel Survey
  – Peak period from travel demand models is assumed to be 30% of the daily volume
  – Throughput increase based on total delay savings and average trip length (in time) from the NB condition
New Location Example

No-Build Scenario
If segments served by project are not operating below posted speed limit - delay saving not counted
Importance of Intersections

- Reducing full movement access points
- Improving turn lanes
- Reducing # of signal phases
- Alternative intersection treatments
Urban Application - US 281 in San Antonio, TX

53% decrease in travel time

Loons to facilitate U-turns
Rural Application - US 17 in Leland, NC

55% decrease in Fatal and Injury crashes

Superstreets can be implemented without signals
Measure Enhancements
Congestion

• Benefits to longer projects may have been impacted
  – Phased improvement projects broken into pieces could score similar results to the entire project
  – Shorter projects have a higher probability of receiving funding

EXAMPLE:

<table>
<thead>
<tr>
<th>District</th>
<th>Description</th>
<th>Throughput Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staunton</td>
<td>Extend SB Deceleration NB Acceleration lanes by 150' each, I-81 Exit 296 in Staunton</td>
<td>1175</td>
</tr>
<tr>
<td>Salem</td>
<td>Construct 1.12 mile auxiliary lane on I-81N between Exit 140 to 141</td>
<td>1664</td>
</tr>
</tbody>
</table>

• Recommend modifying measure to account for increase in person miles travelled allowed by the project within the capacity of the facility
Measuring ACCESSIBILITY

– 60% of score – Change in cumulative job accessibility (within 45 minutes) (within 60 minutes for transit projects)

– 20% of score - Change in cumulative job accessibility for disadvantaged populations (within 45 minutes by automobile and 60 minutes by transit)

– 20% of score – Assessment of the project support for connections between modes, and promotion of multiple transportation choices

<table>
<thead>
<tr>
<th>Factor</th>
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<tr>
<td>Category C</td>
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<td>25%</td>
<td>25%</td>
<td>25%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Category D</td>
<td>10%</td>
<td>35%</td>
<td>15%</td>
<td>30%</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>
Accessibility - How Access to Jobs

- All Projects
  - Using analysis for congestion measures – use change in speed
  - Also consider reduced travel distances from new facilities and changes in land development patterns
  - Use improvement in speed to code improvement into Accessibility GIS tool – conduct before and after analysis to get change in cumulative job access

- Accessibility Tool
  - GIS based model
  - Analysis done at Census block group level – job access between each block group within 45 minutes (60 minutes for transit)
  - Decay factor applied based on travel time
Accessibility - How Access to Jobs

- **Accessibility Tool**

Tool analyzes existing accessibility to jobs
**Accessibility - How Access to Jobs**

- **Accessibility Tool**

  Tool moves to next block, assessing existing accessibility
Accessibility - How Access to Jobs

- Accessibility Tool

Process is repeated for all blocks to establish existing accessibility to jobs
Accessibility - How Access to Jobs

- Accessibility Tool

Tool then analyzes change in access to jobs based on proposed improvement
Accessibility - How Access to Jobs

- Accessibility Tool

Tool moves to next block, calculating change in job access
Process is repeated for all blocks – increase in access for each block is summed and used to score projects
Disadvantaged Access to Jobs

• Similar process in previous slides used for disadvantaged access to jobs

• Main difference is the utilization of disadvantaged population data in the calculation

• Disadvantaged population
  • Low income, elderly, minority, and Limited English Proficiency population percentage by Census Block Group
  • Compared block group and identified block groups in the 75th percentile of the region – regions defined as PDC/MPO/NVTA
Accessibility - How Access to Travel Options

• Projects receive points based on features than enhance multimodal access (Max 5 points)
  • Transit
  • Park and Ride
  • Bike
  • Pedestrian
  • HOV/HOT
  • Real time traveler info or wayfinding

• Scaled by the number of anticipated Non-SOV users
  • Transit Users + Bike Users + Pedestrians + HOV/Park and Ride
Measuring ENVIRONMENTAL QUALITY

- 50% of score – Potential of project to reduce criteria air pollutant and greenhouse gas emissions
- 50% of Score – Potential impacts to natural and cultural resources

<table>
<thead>
<tr>
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<td>Category C</td>
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<td>Category D</td>
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<td>35%</td>
<td>15%</td>
<td>30%</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>
• Air Quality/Energy
  • Non-SOV
    ▪ Points awarded based on:
      – Providing bicycle or pedestrian facilities
      – Improvements for transit
      – New or expanded Park and Ride lot
      – Provisions for hybrid/electric vehicles or energy efficient infrastructure
    ▪ Points scaled based on number of non-SOV users
  • Freight
    ▪ Points awarded based on:
      – Reduces delay at congested intersection, interchange or other bottlenecks
      – Includes improvement to freight rail network or intermodal (truck to rail) facility
    ▪ Points scaled based on truck volume (facilities with 8% trucks or higher)
Environment – How Natural/Cultural Resource Impact

Sum the total acreage of land (within ¼ mile of project) in four categories:

- Conservation Land
- Species/Habitat
- Cultural Resources
- Wetlands

(Data sources: VOF, VDCR, VDOF, VDGIF, NPS, VDHR, USFWS)

**Example**

<table>
<thead>
<tr>
<th>Project</th>
<th>Conservation</th>
<th>Species/Habitat</th>
<th>Cultural Resources</th>
<th>Wetlands</th>
<th>Total Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100</td>
<td>25</td>
<td>25</td>
<td>150</td>
<td>300</td>
</tr>
</tbody>
</table>
Environmental Data Layers

• **Conservation Land:**
  – VDCR
    ▪ 6F Properties
    ▪ Conservation Lands
    ▪ Easements
    ▪ Natural Heritage Screens
  – VDOF Agricultural/Forest Districts
  – VOF Protected easements
  – TNC Protected Easements

• **Species/Habitat:**
  – VDGIF
    ▪ Threatened and Endangered Species
    ▪ Threatened and Endangered Species (Eagles)

• **Cultural Resources:**
  – NPS American Battlefield Protection Program Potential National Register Eligible Areas
  – VDHR
    ▪ Architecture
    ▪ Archaeology

• **Wetlands:**
  – USFWS National Wetlands Inventory
Methodology

Buffer Area

1. Shows ¼-mile buffer created around each submitted project.
Methodology

Buffer Area

2. Apply definition queries to the layers
   (e.g. excluding resources determined not eligible for the National Register of Historic Places)
3. Clip the individual layers to the buffer area for each project.
4. Create a union of all features within each of the four categories and dissolving the resulting shapefile based on the Application ID. (Note: Overlapping acreage within each category will only be counted once; however, acreage between categories may overlap.)
5. Acreages are then calculated for each category and Data exported to tables.
Scaling Impact and Assigning Points:

- The type of environmental document required for each project will be used to assess and scale the potential natural resource impacts.
  - *Environmental Impact Statement* – 50% of acreage will be used for scoring
  - *Environmental Assessment* – 30% of acreage will be used for scoring
  - *Categorical Exclusion* – 10% of acreage will be used for scoring
- In Round 2, the scoring method for this measure was modified - The potential for impact is weighted by the benefits points in other measures.
## Environment – How Natural/Cultural Resource Impact

<table>
<thead>
<tr>
<th>Project</th>
<th>Conservation</th>
<th>Species/Habitat</th>
<th>Cultural Resources</th>
<th>Wetlands</th>
<th>Total Acres</th>
<th>Enviro Doc</th>
<th>Scaled Acres</th>
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<tbody>
<tr>
<td>A</td>
<td>100</td>
<td>25</td>
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<td>B</td>
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<td>25</td>
<td>150</td>
<td>300</td>
<td>EIS</td>
<td>150</td>
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<tr>
<td>C</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>25</td>
<td>CE</td>
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</tbody>
</table>

This value gets divided by the total acres within the ¼ mile project buffer.
Environment
Round 2 Scoring Method

- Impacted buffer ratio is used to develop normalized score (0-100)
- Buffer ratio of 0 = 100 points
- Next lowest buffer ratio >0 = 95 points
- Straight line linear regression between lowest buffer ratio >0 and greatest buffer ratio (greatest buffer ratio = 0 points)

<table>
<thead>
<tr>
<th>Buffer Ratio</th>
<th>Normalized Score</th>
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<td>Project A</td>
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<tr>
<td>Project B</td>
<td>0.05</td>
</tr>
<tr>
<td>Project C</td>
<td>15</td>
</tr>
<tr>
<td>Project D</td>
<td>50</td>
</tr>
</tbody>
</table>

- Normalized points are multiplied by weighted points for other scoring measures (Delay, Throughput, Crash freq, Crash Rate, Access submitt).
- Value above is renormalized 0-100 and weighting (10%*50%) applied to calculate weighted score.
Measuring ECONOMIC DEVELOPMENT

- 60% of score – Assessment of progress made towards new economic development
- 20% of score - Rate projects based on the extent to which the project is deemed to enhance access to critical intermodal locations, interregional freight movement, and/or freight intensive industries
- 20% of score – Project’s impact to travel time reliability

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<tr>
<td>Category C</td>
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<td>25%</td>
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<tr>
<td>Category D</td>
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<td>35%</td>
<td>15%</td>
<td>30%</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>
Economic Development – How Development Supported

• For each project, development sites are identified that the project supports
• Proposed transportation improvement is evaluated on:
  • Consistency with Local Comp Plan/Local Economic Development Strategy – up to 1 point
  • Consistency with Regional Economic Development Strategy – up to 1 point
• Each development site is evaluated on:
  • Consistency with local comp plan/zoning – up to 1 point*
  • Development status – up to 1 point
  • Site utilities – up to 1 point
• Max 5 points per site – used to weight square footage
## Buffers - Tier 1 Project Type – 1 mile buffer

<table>
<thead>
<tr>
<th>Access Management</th>
<th>Convert Existing Lane to Dedicated Bus Service Lane</th>
<th>ITS Improvement(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Add/Construct Bike Lane</strong></td>
<td>Improve Bike/Pedestrian Crossing (At Grade)</td>
<td>New Intersection</td>
</tr>
<tr>
<td><strong>Bike/Pedestrian Other</strong></td>
<td>Improve Bike/Pedestrian Crossing (Grade Separated)</td>
<td>New Park and Ride Lot</td>
</tr>
<tr>
<td><strong>Bus Transit Other</strong></td>
<td>Improve/replace existing bridge(s)</td>
<td>Provide New Service Routes</td>
</tr>
<tr>
<td><strong>Construct Bus Stop / Shelter</strong></td>
<td>New/Expanded Vanpool or On-Demand Transit Service</td>
<td>Rail Transit Other</td>
</tr>
<tr>
<td><strong>Construct Shared-Use Path</strong></td>
<td>Paved Shoulder (Minimum 4-Foot Ridable Surface)</td>
<td>Ramp Improvement(s)</td>
</tr>
<tr>
<td><strong>Construct Sidewalk</strong></td>
<td>Right of Way/Easements acquisition required</td>
<td>Road Diet</td>
</tr>
<tr>
<td><strong>Highway Other</strong></td>
<td>Roadway Reconstruction/Realignment</td>
<td>TDM Other</td>
</tr>
<tr>
<td><strong>Improve Bus Stop/ Shelter</strong></td>
<td>Shoulder Improvement(s)</td>
<td>Turn Lane Improvement(s)</td>
</tr>
<tr>
<td><strong>Improve Park and Ride Lot</strong></td>
<td>Increase Existing Route Service – Addtl Vehicles or Increased Frequency</td>
<td></td>
</tr>
<tr>
<td><strong>Improve Rail Crossing</strong></td>
<td>Widen Existing Lane(s) (No New Lanes)</td>
<td></td>
</tr>
</tbody>
</table>
Economic Development – How Development Supported

Buffers - Tier 2 Project Type – 3 mile buffer

<table>
<thead>
<tr>
<th>Increase Existing Rail Service – Additional Cars or Routes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intersection Improvement(s)</td>
</tr>
<tr>
<td>Managed Lane(s) (HOV/HOT/Shoulder)</td>
</tr>
<tr>
<td>New Traffic Signal/Signal Optimization</td>
</tr>
<tr>
<td>Rail Yard Improvements</td>
</tr>
<tr>
<td>Station or Terminal Improvements</td>
</tr>
</tbody>
</table>
**Economic Development – How Development Supported**

### Buffers - Tier 3 Project Type – 5 mile buffer

<table>
<thead>
<tr>
<th>Project Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add New Through Lanes(s)</td>
</tr>
<tr>
<td>Additional Track - Rail Transit</td>
</tr>
<tr>
<td>Additional Track - Freight Rail</td>
</tr>
<tr>
<td>Freight Haul Increase</td>
</tr>
<tr>
<td>Improve Grade-Separated Interchange</td>
</tr>
<tr>
<td>New Bridge</td>
</tr>
<tr>
<td>New Interchange</td>
</tr>
<tr>
<td>New Rail Yard</td>
</tr>
<tr>
<td>New Station</td>
</tr>
<tr>
<td>New Terminal</td>
</tr>
<tr>
<td>Roadway on New Alignment</td>
</tr>
</tbody>
</table>
Economic Development – How Development Supported

• Adjusting Weighted Square Footage
  – Two Adjustments
    ▪ Distance from project in miles (except sites less than 1 mile)
    ▪ Type of access provided

| Project provides a new, direct (physically to the site), primary access to the site that does not exist today | 100% |
| Project improves existing access (or relocates existing access) to the site directly (Site must be physically adjacent to the project) | 100% |
| 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 | 50% |

• Formula – (Points) x (Square Footage) / (Distance) x (Access Adjustment)

<table>
<thead>
<tr>
<th>Development Name</th>
<th>Total Points</th>
<th>Square Footage</th>
<th>Distance</th>
<th>Site Access</th>
<th>Access Adjustment</th>
<th>Adjusted Square Footage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development A</td>
<td>5</td>
<td>250000</td>
<td>2</td>
<td>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</td>
<td>50%</td>
<td>312500</td>
</tr>
<tr>
<td>Development B</td>
<td>5</td>
<td>250000</td>
<td>0.2</td>
<td>Project improves existing access (or relocates existing access) to the site directly (Site must be physically adjacent to the project)</td>
<td>100%</td>
<td>1250000</td>
</tr>
</tbody>
</table>
• Round 2 results raise concerns about the reasonableness of the results for this measure
• Roundabout project on 2 lane roadway and a cul-de-sac scored highest in the state
• Findings
  – Zoned properties within allowable buffer contributed to anomalous results
  – Gimme points - consistency with plan and utilities

<table>
<thead>
<tr>
<th>Project - Local Plans</th>
<th>Project - Regional Plan</th>
<th>Site - Zoning</th>
<th>Site - Utilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blank</td>
<td>Blank</td>
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<tr>
<td>13</td>
<td>344</td>
<td>141</td>
<td>289</td>
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<tr>
<td>Consistent with</td>
<td>Consistent with</td>
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<td>Consistent with</td>
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</tr>
<tr>
<td>Referenced in</td>
<td>Referenced in</td>
<td>Referenced in</td>
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</tr>
<tr>
<td>1145</td>
<td>703</td>
<td>112</td>
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</tr>
<tr>
<td>Grand Total</td>
<td>Grand Total</td>
<td>Grand Total</td>
<td>Grand Total</td>
</tr>
</tbody>
</table>
Feedback/Direction from June CTB meeting

• Consider additional point for economically distressed areas
  – Several data sources are available for determination of economically distressed areas

• Next several slides outline potential data sources to establish economically distressed areas in Virginia
Fiscal Stress Classification

VA Dept of Housing and Community Development

Index Value
- **High**
- **Above Average**
Per Capita Income 80% or less than US average ($48,112)

US Bureau of Economic Analysis
Per Capita Income 80% or less than US average ($28,930)

US Census - American Community Survey
Unemployment Rate at least 1% greater than national average (4.87%)

Bureau of Labor Statistics - 24 month average
Measure Enhancements
ED.1 - Site Development
Measuring Economic Distress

Economic Indicators for Virginia
State Population: 8,185,130
% Population in Distressed Zip Codes: 15%
Population in Distressed Zip Codes Rank: 24 of 51

Virginia

- No High School Degree: 12%
- Housing Vacancy Rate: 8%
- Adults Not Working: 40%
- Poverty Rate: 12%
- Median Income Ratio: 100%
- Change in Employment: 4.5%
- Change in Businesses: 0.4%
Measure Enhancements
ED.1 - Site Development

Recommendations for Round 3

• Zoned properties must get primary access from project

• Remove 0.5 point for consistency with local and regional plans
  – *Transportation Project specifically referenced in local comprehensive plan or regional economic development strategy = 0.5 points*

• *Project within economically distressed area = 0.5 points*

• Reduce max buffer to 3 miles for economic development sites
Measure Enhancements
ED.1 - Site Development

Recommendations for Round 3 (cont)

• Distinguish the level of readiness for site plans

<table>
<thead>
<tr>
<th>Site Readiness</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conceptual site plan submitted</td>
<td>0.5</td>
</tr>
<tr>
<td>Conceptual site plan approved</td>
<td>1</td>
</tr>
<tr>
<td>Detailed site plan submitted</td>
<td>2</td>
</tr>
<tr>
<td>Detailed site plan approved</td>
<td>4</td>
</tr>
</tbody>
</table>

• Consider the establishment of maximum square footage
  – Based on current level of development - cannot exceed x% of total current square footage in jurisdiction(s)
  – *Currently working with several localities to determine if appropriate data is available*
Economic Development – How Intermodal Access

- **Project can get up to 6 points**
  - **Improve access to distribution centers or intermodal/manufacturing facilities**
    - Within 1 mile – 2 points
    - 1 to 3 miles – 1 point
  - **Improve STAA Truck Route**
    - Improvement to STAA route - 2 points,
    - Improve access to STAA route – 1 point
  - **Improve access or reduce congestion around port/airports**
    - Within 1 mile - 2 points
    - 1-3 miles – 1 point

- **Point are scaled by freight tonnage along corridor – IHS Transearch data was used to calculate daily tonnage on the project**

<table>
<thead>
<tr>
<th></th>
<th>Improve Access to distro, intermodal and manufacturing</th>
<th>Improve STAA truck route</th>
<th>Improve access reduce congestion ports/airports</th>
<th>Tonnage (1000's) per day</th>
<th>Measure Scaled by tonnage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project A</td>
<td>2.00</td>
<td>2.00</td>
<td>0.00</td>
<td>163.07</td>
<td>652.28</td>
</tr>
<tr>
<td>Project B</td>
<td>1.00</td>
<td>2.00</td>
<td>0.00</td>
<td>208.15</td>
<td>624.45</td>
</tr>
<tr>
<td>Project C</td>
<td>2.00</td>
<td>1.00</td>
<td>0.00</td>
<td>4.77</td>
<td>14.31</td>
</tr>
</tbody>
</table>
Measure Enhancements
ED.2 - Intermodal Access

Current Method

• Points are awarded based on a project’s proximity to freight generators, truck routes, and freight destinations
• Total points are scaled by the maximum freight tonnage within the project area
• While the size of a project may affect its likelihood of falling within the buffer distance of freight facilities, its score does not directly scale by the size of the improvement
# Measure Enhancements

ED.2 - Intermodal Access

## Proposed Method

<table>
<thead>
<tr>
<th>District</th>
<th>Project Description</th>
<th>Total Points</th>
<th>Maximum Freight Tonnage</th>
<th>Improvement Length (miles)</th>
<th>Intermodal Access Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staunton</td>
<td>Extend SB Deceleration NB Acceleration lanes by 150’ each, I-81 Exit 296 in Staunton</td>
<td>4</td>
<td>290000</td>
<td>0.06</td>
<td>69,600</td>
</tr>
<tr>
<td>Salem</td>
<td>Construct 1.12 mile auxiliary lane on I-81N between Exit 140 to 141</td>
<td>3</td>
<td>145000</td>
<td>1.12</td>
<td>487,000</td>
</tr>
</tbody>
</table>

## Recommendation

- Scale points by freight tonnage-miles by multiplying the freight tonnage by the length of the improvement
Economic Development – How Travel Time Reliability

• Measure looks at reliability of proposed corridor(s) served by the project
• Buffer Index (BI) - measure of the extra time traveler needs to add to trip to ensure arrival on-time - BI of 0.2 means travel has to add 20% buffer to trip
• Buffer Index is then adjusted to account for the following
  • **Crashes**
    • Crash Frequency - how crashes are affecting reliability (value 0-5)
    • Crash Impact - effectiveness of project to reduce impact of crashes (value 0-2)
  • **Weather**
    • Frequency of weather events (snow and flooding) (value 0-2)
    • Weather impact - effectiveness of project to reduce impact of weather event (Value 0-2)

**TT Reliability Measure**

\[(\text{Crash Freq} \times \text{Crash Impact}) + (\text{Weather Freq} \times \text{Weather Impact})) \times \text{BI}\]

Measure is then scaled by the Vehicle Miles Traveled (VMT) of the project
Measuring LAND USE

– 100% of score – Degree to which project will support transportation efficient land use patterns and local policies

• Points awarded based on:
  • Promoting walkable bicycle friendly mixed use development
  • Supporting in-fill development
  • Having an adopted corridor/access management plan that exceeds VDOT standards

• Points scaled by 2025 Activity Density within 1 mile

Activity Density Calculation - Future Density + Change in Density

Future Density ((2025 Pop+Emp)/Area in sq. mileage) + Change in Density* (2025 Pop+Emp/Buffer Area sqmi)-( 2015 Pop+Emp))/Buffer Area sqmi

<table>
<thead>
<tr>
<th>Project</th>
<th>2015 Pop+Emp Density</th>
<th>2025 Pop+Emp Density</th>
<th>Change in Density</th>
<th>2025 P+E Density + Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10</td>
<td>15</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>B</td>
<td>15</td>
<td>25</td>
<td>10</td>
<td>35</td>
</tr>
<tr>
<td>C</td>
<td>10</td>
<td>9</td>
<td>-1</td>
<td>9</td>
</tr>
</tbody>
</table>
Local/Regional Land Use Policies

- Points awarded based on:
  - Promoting walkable bicycle friendly mixed use development
  - Supporting in-fill development
  - Having an adopted corridor/access management plan that exceeds VDOT standards

- Points scaled by projected population and employment density (from MPO approved travel demand model)
Access to Jobs
Recommended Changes

• Eliminate the 45 and 60 minute cap for auto and transit job access respectively
Land Use

• Focused on projects that support transportation efficient development patterns in urban areas
• Current methodology has limitations
  – Subjectivity
  – Degree to which an area meets certain criteria
• Office of Intermodal Planning and Investment has developed new methodology to measure key characteristics – non-work accessibility
Land Use
Non-work Accessibility

• Examines accessibility to key non-work destinations such as grocery, healthcare, education, etc
• Targets for destinations established using Virginia observations
• Uses GIS software used for Access to Jobs measures
• Eliminate subjectivity and captures degree to which development patterns meet certain criteria
Land Use – Non-Work Accessibility
Northern Virginia
Land Use – Non-Work Accessibility
Roanoke
Land Use
Recommended Measures

• 70% of score based on
  – 2025 population and employment \times \non-work accessibility

• 30% of score based on
  – Change in population and employment (Current day to 2025) \times \non-work accessibility
Communication and Outreach of Scoring
Building Public Trust and Transparency

• During the Scoring Process
  – Blind testing of applications (10%)
  – Independent Verification and Validation
  – External Peer Review Group comprised of
    ▪ Virginia Association of Counties
    ▪ Virginia Municipal League,
    ▪ Virginia Transit Association
    ▪ Other non-governmental groups
Building Public Trust and Transparency

- After Projects are Scored
  - General Assembly provided copy of score cards
  - Documents posted on-line
  - SMART Portal open for review of submitted applications
  - Statewide Public Hearings

- After Projects are Selected for Funding
  - SMART SCALE Dashboard
Scoring Process

- Teams established for each measure
- Central Office lead with regular communication/coordination between Central Office Resources and District Staff
- Utilization of embedded consultant resources at peak
- Conduct QA/QC
- Results combined and score generated
- Scoring results provided to Programming team to generate Staff Recommended Funding Scenario
How projects are recommended for funding

- **Staff Recommended Funding Scenario**
  - Released in January (150 days prior to CTB action to adopt SYIP) along with measure calculations and scores
  - Projects recommended for funding based solely on scores
  - Forms SMART SCALE portion of Draft SYIP
  - Stepwise process
    - Step 1: Fund top scoring projects within each district eligible for DGP funds using DGP funds until remaining funds are insufficient to fund the next highest scoring project.
    - Step 2: Fund top scoring projects within each district that would have otherwise been funded with available DGP funds, but were not because they are only eligible for HPP funds, using HPP funds, as long as their SMART SCALE cost does not exceed the total amount of DGP funds available to be programmed based on their rank.
    - Step 3: Fund projects with a benefit relative to SMART SCALE score greater than an established threshold based on the highest project benefit using HPP funds until funds are insufficient to fund the next unfunded project with the highest project benefit.
Group Discussion
Q&A
Lessons Learned
Lessons Learned

After both rounds completed:

• Conducted Key Lessons Learned Activities

• External Review Group
  – Review of measures development and scores

• Internal and External Stakeholder Surveys
  – Surveys focused on application in-take process, screening and validation

• Implementation Team Workshops (included OIPI, DRPT, VDOT staff)
  – Workshops focused on all aspects of process
Areas for Improvement
External Review Group

• Consider approach to scale cost to avoid bias of low cost projects

• Consider modifications to accessibility measure to include non-work accessibility

• Provide additional feedback to applicants to improve application quality in future rounds

• Process was transparent and a great deal of information was made available to facilitate understanding
Lessons Learned

- Stakeholder surveys were conducted in December 2015/January 2016 (Round 1) and December 2016 (Round 2), focusing on the application intake, screening and validation processes:
  - External Survey, for Applicants and Sponsors
  - Internal Survey, for VDOT and DRPT staff, received 84 responses

- Internal workshop with VDPT/DRPT staff involved in SMART SCALE process

- Feedback helps us improve the process and better understand what worked and what didn’t work

- As a result of the lessons learned, identify possible changes to the process and policy
Survey Results - Challenges

• **Application Timing.** Insufficient time given to complete all the required collaboration, application preparation, and submission

• **Process Consistency.** Changing rules, process, and guidelines as the process evolved

• **Data & Documentation Collection.** Significant data collection requirements for the pre-application and application, including “information, documentation, site plans, etc.”

• **Time/Staffing Requirements.** Time required for applicants to collect data and prepare application, travel and attend training sessions, and understand all SMART SCALE material on top of their daily work activities

• **Economic Development Factor.** Understanding the ED factor along with “trying to estimate future economic benefit”

• **Jurisdictional Equity.** Ability to compete against other jurisdictions that had other local funding sources
Survey Results - Successes

• **VDOT/DRPT Staff Assistance.** VDOT /DRPT staff praised for developing and implementing such a comprehensive process in such a short timeframe, and subsequent assistance and over-and-beyond helpfulness.

• **SMART SCALE Outreach and Training.** VDOT/DRPT staff lauded by applicants for provision and helpfulness during SMART SCALE outreach and training. Several District staff were specifically mentioned by applicants as being especially “easy to work with”, “helpful”, “reassuring”, and “quick responding.”

• **SMART SCALE Online Application Tool.** SMART SCALE Online Application Tool was “user-friendly,” “making use of technology for ease of use,” “easy-to-follow,” and “the ability to save work and resume at a later time without losing data or time.”

• **SMART SCALE’s Objectivity.** Best part of SMART SCALE is its attempt to “level the playing field” in terms of transportation projects across the State.
Areas for Improvement
Implementation Team

• **Guidance and Information Sources**
  – Update and improve clarity of Policy Guide and FAQs
  – Add tutorials and include example projects

• **Pre-Application Training and Coordination**
  – Start coordination process early
  – Develop “Train the Trainer” materials on process to ensure consistent guidance statewide
  – Provide clear direction on application requirements, and ensure project readiness before proceeding with application
  – Require completion of the pre-application form

• **Validation/Screening**
  – Define criteria for meeting VTrans needs and project type eligibility
  – Determine if project is eligible/meets a VTrans need before further development of application

• **Evaluation and Scoring**
  – Provide better definitions of inputs such as mixed-use land use and economic development impacts
  – Potentially consider tiers of projects based on size – so that a turn lane project is not competing against a mega project
Recommendations to Improve Application Process
Round 1

• Update application tool to allow feedback during application submission (pre-screening and validation)
• Strongly encourage submission of information early
  – Advance knowledge of the number and types of applications
  – Notice of Intent to Apply - early screening decisions

Over half the 321 submitted applications were created the final two weeks
Recommendations for Administrative Process Round 1

- Project includes matching funds from other sources then documentation of availability of other funds will be required and commitment to fund if other sources do not become available.

- If project cost at advertisement or award exceeds thresholds in SMART SCALE policy then project must be reevaluated (Rescoring):
  - IF revised benefits/cost is higher than lowest scoring funded district project then project moves forward
  - IF revised benefits/cost is lower then funds will be de-allocated unless CTB takes action to retain funding on project and address shortfall
  - IF revised budget exceeds sliding scale CTB takes action to address shortfall
  - Developed guidelines for reevaluation
Recommendations for Factor Areas Round 1

• Environmental Factor
  – Projects receiving significant amount of points without providing any other benefits
  – Determine points by scaling environmental score based on impact to environment (current methodology) and benefits in other categories.

• Economic Development Site Support
  – Types of projects evaluated do not influence growth over the same impact area
  – In many localities zoning took place 30+ years ago and does not necessarily have relationship to current growth patterns
  – Restrict the distance around certain types of projects where benefits may be considered – buffers by project type
  – Eliminate the extra scaling point for having zoning in place
Recommendations for Factor Areas
Round 1

• Reliability
  – Buffer Time Index (BTI) comes from INRIX data – does not provide statewide coverage
  – For facilities where data does not exist, method pulls BTI from other nearby facilities – this approach leads to questionable results on low volume roadways
  – If INRIX BTI data does not exist, assume there is no reliability issue and score will be 0
  – Include scaling factor based on vehicle miles traveled – to better scale the benefit – testing underway

• Intermodal Access
  – Questionable results when comparing measure scores to project types, specifically with using mainline tonnage
  – Refine methodology to adjust tonnage for ramps
Recommendations for Factor Areas
Round 1

- Safety
  - Fatal and Severe Injury crashes represent about 7% of total crashes
  - Some fatal and severe injuries crashes are random and due to factors unrelated to roadway design
  - Look at Fatal and All Injury crashes – apply federal EPDO weighting
- Land Use
  - Measure provides points based on projected future density but does not consider whether there is any growth between today and the future
  - Base score on both future density and the change in density between today and the future
Modification for Scoring Process – Corridor-based Transit Improvement Round 1

- Transit
  - Chicken/Egg problem – all VRE platforms must be extended to add new rail cars to all trains, but only final platform extension would receive benefits under current methodology
  - Example: Brooke and Leeland platform extensions by themselves do not allow for longer trains but without those improvements longer trains will never be able to run
  - Analyze full corridor improvement (station + future capacity improvement) and assign benefit score on a pro-rata basis – If station improvement is 10% of the cost, then we take 10% of the ultimate benefit
  - $10,000,000 platform and station improvement that will facilitate a $90,000,000 future investment in rolling stock and service expansion. We would analyze full improvement, then take 10% of Total Benefit Score
Recommendations to Improve Application Process

• SMART SCALE on-line application tool undergoing improvements based on feedback
  – Improved logic for applicant eligibility
  – Improved logic for some factor areas (especially Economic Development)

• Online application tool will be expanded to include other funding programs:
  – Revenue Sharing Program
  – Transportation Alternatives Program
  – Highway Safety Improvement Program
  – Bicycle-Pedestrian Safety Program
Lessons Learned
SMART SCALE Policy
Round 2

- **Project Eligibility** – need to more clearly define in the Policy and Technical Guide project types that are not eligible for SMART SCALE – this year there were a number of signal system projects and bridge projects that were in a gray area. Very frustrating for applicants.

- **Economic Development**
  - Eligibility and rules regarding zoned-only properties
  - More stringent documentation requirements
  - Buffer logic – possibility of limiting to linear buffer along facilities being improved

- **Project Readiness** – **clearer definition of project readiness**
  - Limited Access Roadways - new interchanges and modifications to existing – IMR/ IJR with preferred alternative identified – concurrence from FHWA on Interstate facilities
  - Traffic Signal Warrants
• **Notice of Intent to Apply** – majority of respondents (82%) indicated the instructions were clear but challenges included uncertainty that it was required, change in deadline caused confusion, and did not receive confirmation that NOI had been received

• **Submission Deadline** – majority of respondents (77%) said application period was long enough (up from 68%), 77% said applications are not submitted earlier in the submission period as data is still being acquired/reviewed/updated

• **Needed Revisions/Improvements to Sections of Application or Instructions** – VTrans Needs Description (50%), Factor Inputs – Economic Development (40%), and Project Location Mapping (37%)
Applying what we learned
Application Process
Round 2

• **2-Step Application**
  – 1\textsuperscript{st} step – similar to NOI – basic information and project description
  – Eligibility and screening (meet VTrans need)
  – 2\textsuperscript{nd} step – projects eligible and screened as meeting need proceed to fill out full application

• **Move up deadline**
  – March 2018 – open Portal to begin Round 3 applications
  – August 1\textsuperscript{st} submission deadline – provides 5 months to conduct analysis and scoring

• **Improve functionality of SMART Portal**
  – Improve mapping and VTrans needs components
  – Ability to clone applications between grant programs
Lessons Learned
Validation Process
Round 2

• **Nature of Changes needed** – documentation for economic development, needed more detail on project description or revisions to project sketch, changes to project cost and schedule – cost estimate had to be revised to match funding allocation schedule

• **Needed Revisions/Improvements to Validation Process**
  – Improve data entry
  – Streamline common fields
  – Incorporate Validation Process/Tool into the SMART Portal
General Observations– Scoring
Round 2

- **Project planning/Readiness**
  - Number of applications with little to no prior planning analysis or alternatives testing
  - Planning critical to minimize project risks
  - No planning raises question of public buy in to proposed improvement

- **Project Description** – *why* is less important than *what* – need clear project description

- **Round 1 vs Round 2**

<table>
<thead>
<tr>
<th></th>
<th>Round 1</th>
<th>Round 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Project $</td>
<td>$46,700,000</td>
<td>$27,000,000</td>
</tr>
<tr>
<td>Requested $</td>
<td>$25,700,000</td>
<td>$21,200,000</td>
</tr>
<tr>
<td>Benefit Score</td>
<td>3.02</td>
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</tr>
<tr>
<td>SMART SCALE Score</td>
<td>6.92</td>
<td>10.13</td>
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</table>
‘Look Back’ – Weighting Frameworks

Examined what would happen to staff recommended scenario from Round 2 if weighting frameworks were modified

- 2 categories – ‘urban’ (A and B combined), ‘rural’ (C and D combined)
- 1 category – congestion and safety
- 1 category – safety and economic development
- 1 category – all measures are weighted equal

<table>
<thead>
<tr>
<th>Factor</th>
<th>Congestion Mitigation</th>
<th>Economic Development</th>
<th>Accessibility</th>
<th>Safety</th>
<th>Environmental Quality</th>
<th>Land Use</th>
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</thead>
<tbody>
<tr>
<td>Category A</td>
<td>45%</td>
<td>5%</td>
<td>15%</td>
<td>5%</td>
<td>10%</td>
<td>20%</td>
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<tr>
<td>Category B</td>
<td>15%</td>
<td>20%</td>
<td>25%</td>
<td>20%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Category C</td>
<td>15%</td>
<td>25%</td>
<td>25%</td>
<td>25%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Category D</td>
<td>10%</td>
<td>35%</td>
<td>15%</td>
<td>30%</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>
Evaluation of Weighting Frameworks - Conclusions

- Major changes to weighting frameworks results in a 7-25% change in projects selected and a -3 to 4% change in project funding
- Modifications to Area Type C had minimal impact on number of projects selected in funding scenario; however, Area Type C received additional funding
- As determined previously, measures appear to have greater influence over whether a project is funded than weighting frameworks
- Currently, no proposed changes to weighting frameworks
“Look Back” – Is there a bias in project size?

- The number of projects by size funded through SMART SCALE is in line with the number of projects by size funded in the FY06-11 Six-Year Improvement Program.
- The amount of funding going to projects of a certain size funded through SMART SCALE is in line with the amount of funding going to projects of a certain size funded in the FY06-11 Six-Year Improvement Program.

<table>
<thead>
<tr>
<th></th>
<th>&lt;=$5,000,000</th>
<th>&gt;$5,000,000</th>
<th>&gt;=$20,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2006 SYIP</td>
<td>10%</td>
<td>28%</td>
<td>62%</td>
</tr>
<tr>
<td>Round 1*</td>
<td>11%</td>
<td>32%</td>
<td>57%</td>
</tr>
<tr>
<td>Round 2</td>
<td>17%</td>
<td>24%</td>
<td>59%</td>
</tr>
</tbody>
</table>

* Analysis excludes Transform 66
‘Look Back’ – What types of projects are being funded through SMART SCALE?

- **Round 1**
  - 92% of funding to Highways
  - 8% of funding to Bike/Ped, Bus Transit, Rail Transit, and TDM
  - Bus Transit projects most successful (100% funded)
  - Rail Transit projects least successful (33% funded)

- **Round 2**
  - 81% of funding to Highways
  - 19% of funding to Bike/Ped, Bus Transit, Rail Transit, and TDM
  - Rail Transit projects most successful (100% funded)
  - Highway projects least successful (32% funded)
Proposed Changes to Administrative Policies and Procedures

• Biennial schedule
• Number of applications allowed per applicant
• Project readiness
• Project eligibility
Biennial Cycle
# Number of Applications

<table>
<thead>
<tr>
<th></th>
<th>Round 1</th>
<th>Round 2</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total # Submitted</td>
<td>321</td>
<td>436</td>
<td>36%</td>
</tr>
<tr>
<td>Total # Scored</td>
<td>287</td>
<td>404</td>
<td>41%</td>
</tr>
<tr>
<td>Average # Application</td>
<td>2.2</td>
<td>2.8</td>
<td>27%</td>
</tr>
<tr>
<td>Max # of Applications</td>
<td>12</td>
<td>33</td>
<td>175%</td>
</tr>
</tbody>
</table>
Recommended Limits on Number of Applications

June CTB Meeting Generated Significant Discussion

- Approach modified
- Established 2 tiers based on population

<table>
<thead>
<tr>
<th>Tier</th>
<th>Localities</th>
<th>MPOs/PDCs/Transit Agencies</th>
<th>Maximum Number of Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Less than 200K</td>
<td>Less than 500K</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Greater than 200K</td>
<td>Greater than 500K</td>
<td>10</td>
</tr>
</tbody>
</table>
Recommended Limits on Number of Applications

<table>
<thead>
<tr>
<th>Tier</th>
<th>No. of Local/Regional Entities</th>
<th>Maximum Number of Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (4 apps max)</td>
<td>238</td>
<td>952</td>
</tr>
<tr>
<td>2 (8 apps max)</td>
<td>18</td>
<td>144</td>
</tr>
<tr>
<td>Grand Total</td>
<td>256</td>
<td>1096</td>
</tr>
</tbody>
</table>

Increases total number of applications by 111
Project Readiness

**ISSUE:** Need clear guidance on the required level of planning and supporting documentation needed for major projects.

Applicability:
- Grade Separations
- New Traffic Signals
- New Location Facilities
- Major Corridor Widening projects
- Environmental (NEPA and Permitting)
- Public Support
Project Readiness Recommendations

Proposed Changes

• Grade Separation on all limited access facilities
  – Require IJR with preferred alternative

• Grade Separation of at-grade intersection
  – Require planning level study and alternatives analysis

• New Traffic Signals
  – Require Signal Warrant and Justification and evaluation of alternative intersections
Project Readiness Recommendations

Proposed Changes:

• **New Location**
  – Assess requirement for evaluation of multiple alternatives (NEPA/permitting)

• **Major Widenings**
  – Ensure alternatives to optimize the existing capacity have been thoroughly evaluated as part of the planning process

• **Public Support**
  – Require local resolution of support as a part of application process
  – Examples
    • North Main Intersection Improvements at 460 Bypass - Blacksburg - Round 1
    • University Drive Extension - City of Fairfax - Round 1
Project Eligibility

**ISSUE:** Need to provide clear guidance on how to handle projects that may include asset replacement, in addition to a capacity expansion or enhancement improvement.

- A number of projects submitted in Round 1 and Round 2 were mostly asset replacement projects
- Traffic signal system and bridge replacements being the most common examples
- Applicants would often include a minor component that is eligible
Project Eligibility

Proposed Changes

- SMART SCALE is not intended to fund maintenance and State of Good Repair projects
- Clarify eligibility language in the SMART SCALE policy - If a significant portion of the project costs are related to the repair or replacement of existing traffic control devices, structures or bridges asset replacement the project be excluded from consideration in scoring and rating for SMART SCALE.
ISSUE: Need to define clear rules regarding projects that are fully funded or committed

- Several projects submitted included, in part or whole, proffered improvements
- Some applications leveraged fully funded projects and were asking for minor enhancements or additions
- Risk that applicants could use this approach to game the system (large benefit with reduced $ request)
**ISSUE:** Some applicants included project elements that were not clearly related to one another.

- Project features must be associated such that they are contiguous or of the same improvement type (e.g., signal improvements, transit stations, etc.)
  - Concern about potential to circumvent application limits
  - Concern about adding unrelated features to increase benefit
Resources

- VTrans
  www.vtrans.org
Group Discussion
Q&A