NORTHERN VIRGINIA TRANSPORTATION AUTHORITY

Technical Advisory Committee
July 16, 2014 at 7pm
NVTA Office – 3060 Williams Drive (Suite 510)

AGENDA

I.	**Call to Order/Welcome**	Chair Boice
II.	**Approval of Summary Notes – June 18, 2014**	Chair Boice
III.	**HB 599 Presentation**	VDOT
IV.	**NVTA Updates**	Monica Backmon
V.	**Adjournment**	

Next Meeting

Wednesday, September 17, at 7pm
Location to be confirmed

NORTHERN VIRGINIA TRANSPORTATION AUTHORITY

Technical Advisory Committee
June 18, 2014 at 7pm
NVTA Office – 3060 Williams Drive (Suite 510)

SUMMARY NOTES

I. Call to Order/Welcome Chair Boice

- Chair Boice called the meeting to order at 7:02pm.
- Attendees:
  - ✓ Members: Chair Boice; Robert Dunphy; Agnes Artemel; Meredith Judy; Pat Turner.
  - ✓ NVTA Staff: Monica Backmon (Executive Director); Keith Jasper (Program Coordinator); Denise Harris (Program Coordinator).
  - ✓ Other Staff: Noelle Dominguez (Vice Chair, JACC).
- Chair Boice reported that, after polling Committee members, there is no alternative evening for scheduling the TAC meeting that works for everyone. Consequently the monthly TAC meeting will remain on the third Wednesday of the month.

II. Approval of Summary Notes – May 21, 2014

- Ms. Artemel moved to approve the minutes of May 21, 2014; seconded by Mr. Dunphy. Motion carried unanimously.

III. NVTA Updates Monica Backmon

- The Authority meeting scheduled for July 10, 2014 has been rescheduled to July 24. At the Authority's July meeting, VDOT will present the initial findings of the HB599 rating study.
- VDOT is scheduled to present these findings to the Committee at its next meeting on July 16.
- Chair Boice is unavailable to present the TAC report at the Authority's July meeting. Instead, Ms. Judy will present the report on behalf of the Committee.
- A process is underway for replacing former member Mr. Puentes, with a replacement expected to be appointed at the Authority's July meeting.

IV. TransAction 2040 RFP Discussion

- The Committee had a wide-ranging discussion about the previously issued (February 25, 2010) RFP for the TransAction 2040 long range plan. The purpose of this discussion is to provide inputs to the potential statement of work (and other content) for the upcoming RFP for the TransAction 2040 long range plan update. Key highlights/suggestions were:

  Pricing

  - ✓ Consider options for incorporating price into the selection process, e.g. professional services contract (negotiate price with most qualified firm), use a low weighting for price in the evaluation criteria (or as a tie-breaker), specify budget price in RFP, request a range of prices (to reflect uncertainty in scope), and request prices for optional items.
  - ✓ Some otherwise qualified firms may be dissuaded from bidding if Task 1 addresses scope finalization – this may place unacceptable risk on some consultants when pricing their proposals to be competitive.
  - ✓ Inputs on scope from the Committee would enable staff to determine an appropriate budget recommendation for future Authority approval.

  General

  - ✓ Should the TransAction 2040 vision and goals be revisited? Given recent legislation (HB2313, HB599, and HB2) and associated objectives, the Committee considered it was appropriate to review and possibly update the vision and goals for the plan update.
  - ✓ To what extent should the project selection and prioritization process for NVTA regional projects (funded with 70% revenues) reflect the requirement that each locality's total long-term benefit be approximately equal to the proportion of the total of the fees and taxes received by the Authority that are generated by or attributable to the locality divided by the total of such fees and taxes received by the Authority? The Committee considered this was a topic for the ongoing discussion on long term benefits.
  - ✓ How should regional transportation projects be defined? The Committee agreed to discuss this in detail at the July meeting.
  - ✓ What, if anything, should we attempt to learn about regional planning from other metropolitan areas, e.g. best practices? This could be addressed by making it a requirement for proposers to demonstrate that they bring relevant experience from other metropolitan areas.

  Analytical Approaches

  - ✓ Should the plan incorporate project selection and prioritization processes that reflect HB599 (and HB2) rating processes? Members would like to understand more about the different analytical requirements of each legislation, including

how they would be applied to different funding streams (including leveraged funds) and for different types of project. The Committee considered it would be interesting to compare analyses required by each legislation, although the long range plan should be unconstrained. However it was noted that there is a practical limit on the number of projects that can be rated under HB599, which may have the potential effect of constraining the number of projects.

- ✓ What performance measures should be considered, e.g. travel times, delays, reliability, congestion duration, person hours of delay, person hours of congested travel in autos, person hours of congested travel in transit vehicles, transit crowding, connectivity to regional activity centers, accessibility to jobs, accessibility to labor, safety, air quality, emergency mobility? The Committee recognized the importance and complexity of this topic and agreed to discuss this in detail at the July meeting.
- ✓ Are alternative/additional/fewer measures or criteria needed? This will be addressed in concert with the preceding bullet.
- ✓ What level of sensitivity analysis is required, e.g. various VMT trend possibilities? The Committee noted the link between increased analysis and increased cost, but considered that making the appropriate investment decisions justified some level of sensitivity analysis.
- ✓ What level of cost/benefit analysis is required, e.g. "to move the most people in the most cost-effective manner?" This should be addressed at some level, to help make comparisons between projects. Proposers could be asked to suggest an appropriate methodology for doing this.

<u>Future Trends</u>

- ✓ Should the plan include scenario analysis? If so, what types of scenario? Again noting the potential impact on cost, the Committee considered it was appropriate to include scenario analysis, e.g. city-focus, activity center focus, and suburban sprawl focus.
- ✓ How should recent trends be investigated, e.g. Baby Boomers and Millennials? This could be included as part of the scenario analysis.
- ✓ What other trends or risks do you foresee that may influence transportation needs in the coming decades? Suggestions included housing prices, oil prices, driverless vehicles, biking, and car-sharing (and related impacts on vehicle ownership). Some or all of these could be incorporated into the sensitivity analysis discussed earlier. The Committee was uncertain how reliably these trends and risks could be incorporated into the analysis, and suggested that a qualitative approach may be more appropriate.
- ✓ To what extent should resiliency and emergency preparedness be addressed? The Committee considered that it was important to include these components as they relate to regional evacuations and mitigation of loss of infrastructure capacity.

Transportation Solutions

- ✓ The Committee agreed that projects should include infrastructure enhancements, e.g. new capacity, bottleneck mitigation; demand management, (pricing, managed lanes, trip reduction) and operational efficiencies including transportation technology.
- ✓ Out-of-the-box solutions, innovations, and telecommuting (non-federal) should be included where appropriate, and could be included in the sensitivity analysis.

Outreach and Communications

- ✓ How do we engage the public effectively? The selected consultant will be required to develop an overall plan, but it is hoped that jurisdictional and NVTA staff will be able to support this activity and create the potential for increased effectiveness at a reduced cost compared to previously.
- ✓ What is the role of social media in public engagement? The Committee agreed there is a role for social media. NVTA staff is currently exploring opportunities.

- At the conclusion of the discussion, the Committee agreed to revisit selected topics at the July meeting:
  - ✓ Vision and goals.
  - ✓ Definition of regional transportation projects.
  - ✓ Recommended performance measures.

V. Adjournment

- Meeting adjourned at 8:53pm.

Evaluation and Rating of Significant Transportation Projects in NoVA

Basic Project Evaluation and Rating

July 16, 2014

NVTA – Technical Advisory Committee

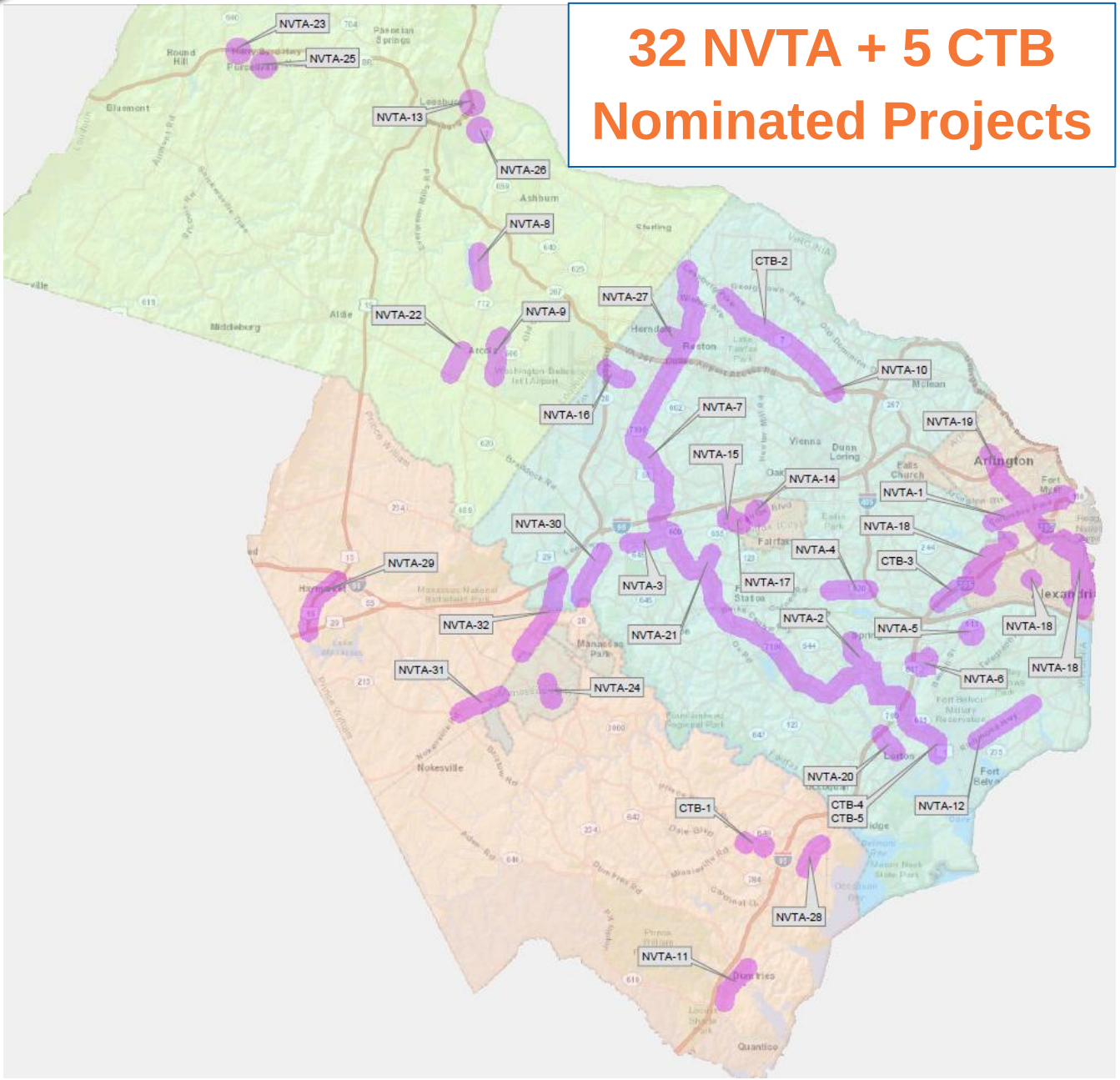
Briefing Outline

- Projects Nominated and Selected for Evaluation and Rating
- Basic Evaluation Approach and Rating – Purpose
- Basic Evaluation and Analysis - Methodology
- Performance Measures for Basic Ratings
- Comments and Responses
- Basic Ratings – 2020 and 2040
- Next Steps

Nominated Projects

- **37 projects nominated (32 NVTA, 5 NoVA CTB)**
  - **24 roadway improvements/widenings**
  - **1 HOV widening**
  - **5 interchange construction**
  - **5 intersection improvements**
  - **2 ITS traveler information / traffic management projects**
  - **No transit projects**

32 NVTA + 5 CTB Nominated Projects



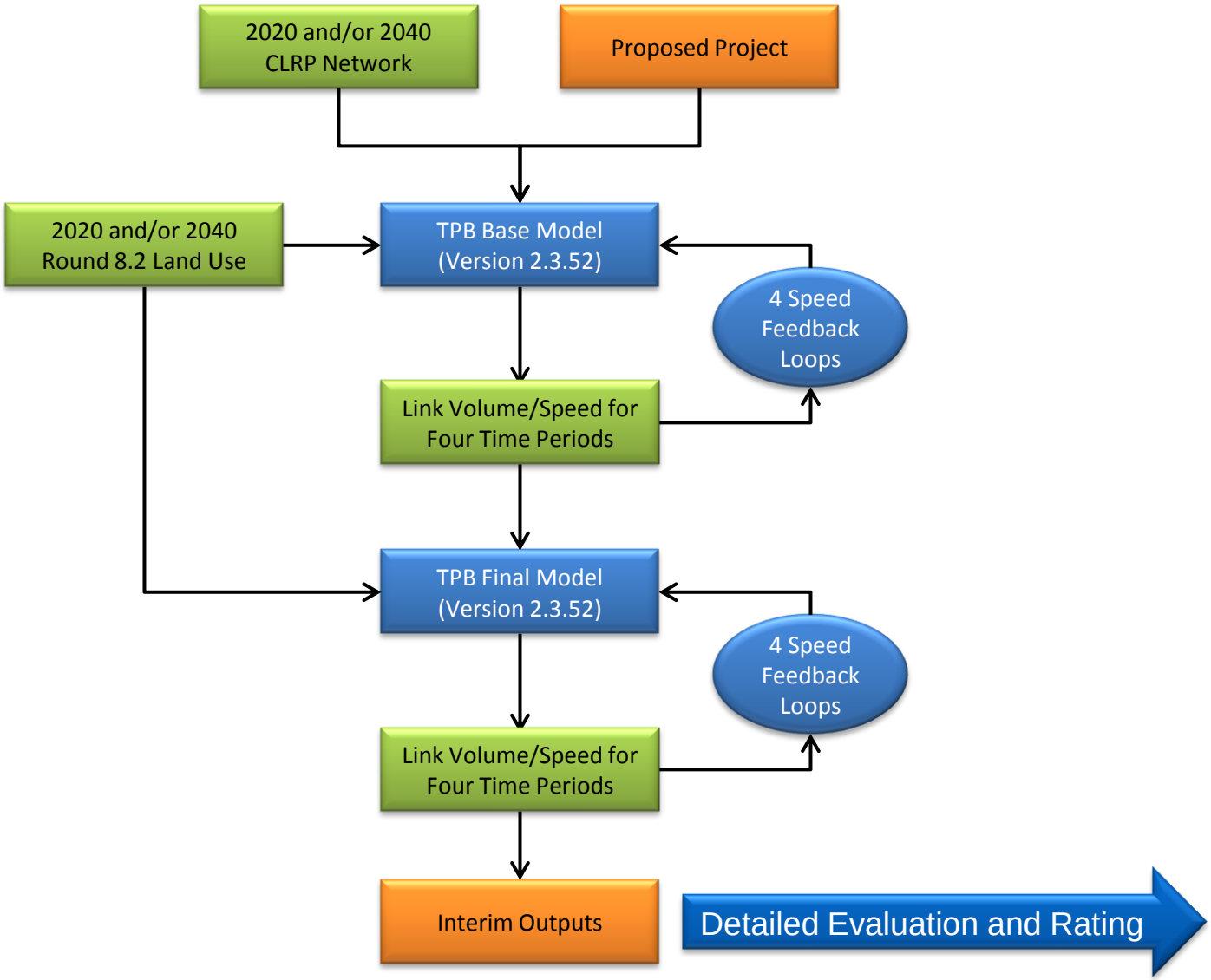
Basic Evaluation and Rating - Purpose

- Addresses the difference in the schedules for the HB 599 Study and NVTA's Six Year Program Development
- Basic / high-level rating will enable NVTA to begin development of its Six Year program (2.5 years)
- These ratings are based on the results of regional level analysis using the TPB travel demand model
- Traditional travel demand models (like TPB model) are not sensitive to small, traffic operational improvements
- Demand model outputs feed into the more detailed analysis and rating using operational simulation models
- The detailed operational ratings distributed in December may differ from the basic rating for some projects

Basic Analysis and Evaluation Methodology

- **Apply the COG/TPB Regional Travel Model for each Project**
  - Full runs of the TPB Version 2.3.52 model with the currently adopted 2013 CLRP highway and transit networks and the Round 8.2 Cooperative Land Use Forecasts for 2020 and 2040
  - If the project is not included in the 2020 or 2040 CLRP, add the project to the network and calculate impacts based on project minus base
  - If the project is included in the 2020 or 2040 CLRP, subtract the project from the network and calculate impacts based on base minus project
- **Calculate the project's impact using 5 specific performance measures**
  - Three measures examined impact on the facility
  - Two measures examine impact on an area around the project with greatest impact

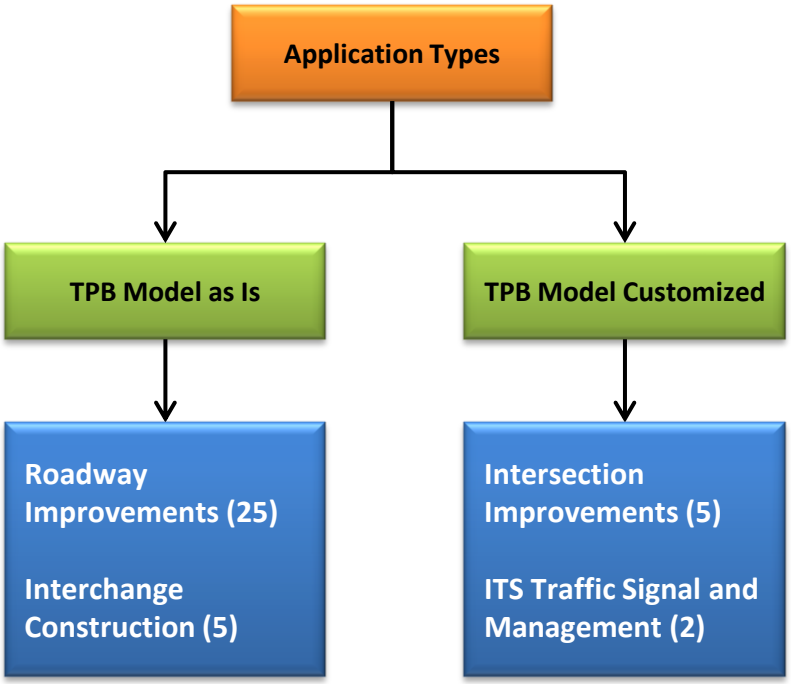
TPB Travel Model → Travel Demand



Enhancements to Regional Demand Model

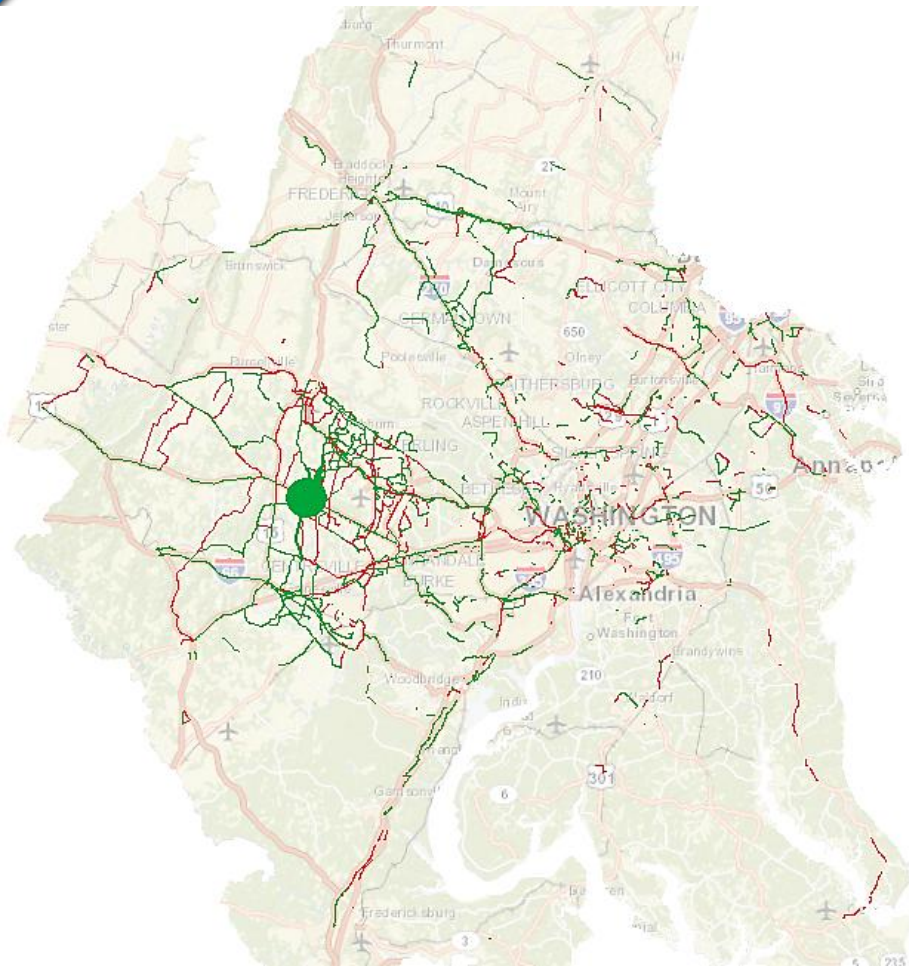
- **Performed a full model run for each project rather than an assignment-only analysis**
- **Modify the TPB model for projects that focus on traffic operational improvements**
  - Projects that added turn pocket lanes or signal timing improvements
    - Added capacity to intersection approach and/or free flow speed
  - Projects that included active traffic management and traveler information and incident response systems
    - Adjusted the volume-delay equation to generated slightly higher loaded speeds at V/C ratios near 1.0

Basic Model Application by Project Type



- **Customized Applications**
  - Estimated using documented experience
  - NVTA 1: 15% speed and capacity improvements
  - NVTA 14: 30% capacity improvement
  - NVTA 18, 19: ITS-related volume-delay functions
  - NVTA 25: 5% speed improvements
  - CTB 4, 5: 50% speed and capacity improvements

Modeled Impacts Far from Project Location



NVTA 22: Northstar

Issue: Cube assignment software generated some illogical results

- Small volume/speed changes over a large area and far from the project
  - Typical of traditional travel demand models
- Distorts the project impacts at the Northern Virginia and County levels

Fix: Limit the rating calculations to a project impact area

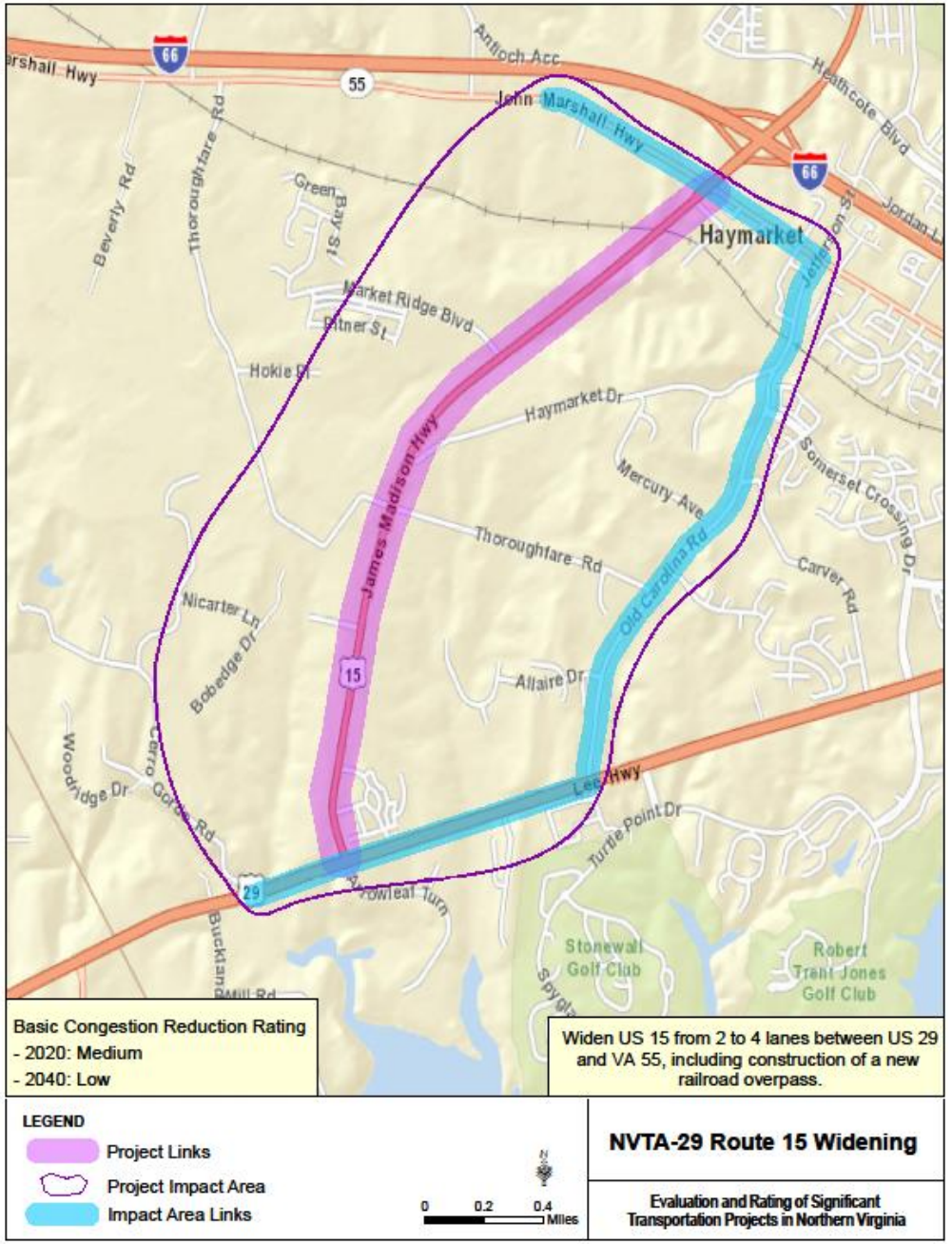
Impact Area Definition

- **Impact Areas for each project were defined using the 2020 model results and the following link-based criteria:**
  - Change in volumes >250 vehicles during peak period

    OR

  - >20% change in peak-period volume (with minimum 100 vehicle change)
- **New projects use parallel facilities to measure the changes in volume and performance measures**
- **Results for 2020 and 2040 showed very similar areas**

Decided to use smooth polygons around impacted links to designate the area of greatest impact



Performance Measures for Basic Ratings

- **Calculated on the Roadway being improved**
  - Reduce the maximum peak period V/C ratio on the project facility
  - Increase the daily person miles of travel (PMT) on the project facility
  - Increase the PMT per Capacity increase on the project facility
- **Calculated over an Area experiencing the greatest impact**
  - Reduce the total congested PMT in the project impact area
  - Reduce the minutes of travel time per mile in the project impact area

Project Facility Measures

- **Maximum V/C Ratio** *(objective – decrease V/C ratio)*
  - Change calculated on a link with highest ratio within the project segment
  - For new facilities maximum V/C ratio on a parallel facility is used as the base
  - If the V/C ratio is < 0.9 (LOS E) or the V/C ratio increases, zero points
- **Person Miles of Travel** *(objective – increase PMT)*
  - Change calculated on all links (both directions) within the project limits
  - For new facilities PMT on a parallel facility is used as the base
  - Decrease in PMT gets zero points (no projects had a decrease)
- **PMT per Capacity Increase** *(objective – higher ratios)*
  - Change in total PMT divided by the total miles of hourly capacity added by the project to the facility
  - For a new facility PMT on a parallel facility is used as the base

Measures for the Area of Greatest Impact

- **Congested Person Miles of Travel** *(objective – decrease CPMT)*
  - Change in PMT on links in the impact area with V/C ratios > 0.9 (LOS E)
  - Increase in congested PMT or no links with V/C ratios > 0.9 get zero points
- **Minutes of Travel Time per Mile** *(objective – decrease travel time)*
  - Person hours of travel / person miles of travel
  - Score based on percent change
  - Increases receive zero points

General Comments from Stakeholders

- ✓ Sum the MOE's to a total score and then assign the High/Med/Low ratings using the natural breaks method
- ✓ Re-name the impact area as "area of greatest impact"
- ✓ Review and document the rational for selecting links and zones for inclusion in the impact area
- ✓ Expand the impact areas to include all TAZ's that are contiguous to each project
- ✓ Include links that are near the 250 vehicle / 20% threshold
- ✓ Develop the ratings for 2040 in addition to 2020
- ✓ Examine the approach used for the High/Med/Low ratings and consider rounding up total scores near the boundary
- ✗ Report a total score (sum of scores for the 5 MOEs) for each project rather than High/Med/Low rating
- ✗ Normalize all the MOE's by the capacity added value

Alternative Scoring and Rating Methods

- **Changes in individual performance measures due to the addition of each project summed to a total score**
- **Looked at alternative methods for setting Low/Medium/High ratings based on total scores**
  A. Apply the Jenks-Breaks algorithm from ArcGIS to assign projects with similar scores to the same group (not focused on 1/3 distribution)
  B. Identify natural breaks in total scores (scoring gaps) that assign approximately 1/3 of the projects to each rating level (rounding up)
  C. Rank order the projects by total score and assign 1/3 of the projects to each rating
  D. Calculate the percent difference between the total score of each project and the project with the highest score and divide the 100 point scale into thirds for the three ratings
- **Selected 1/3 Ranking method for Ratings**

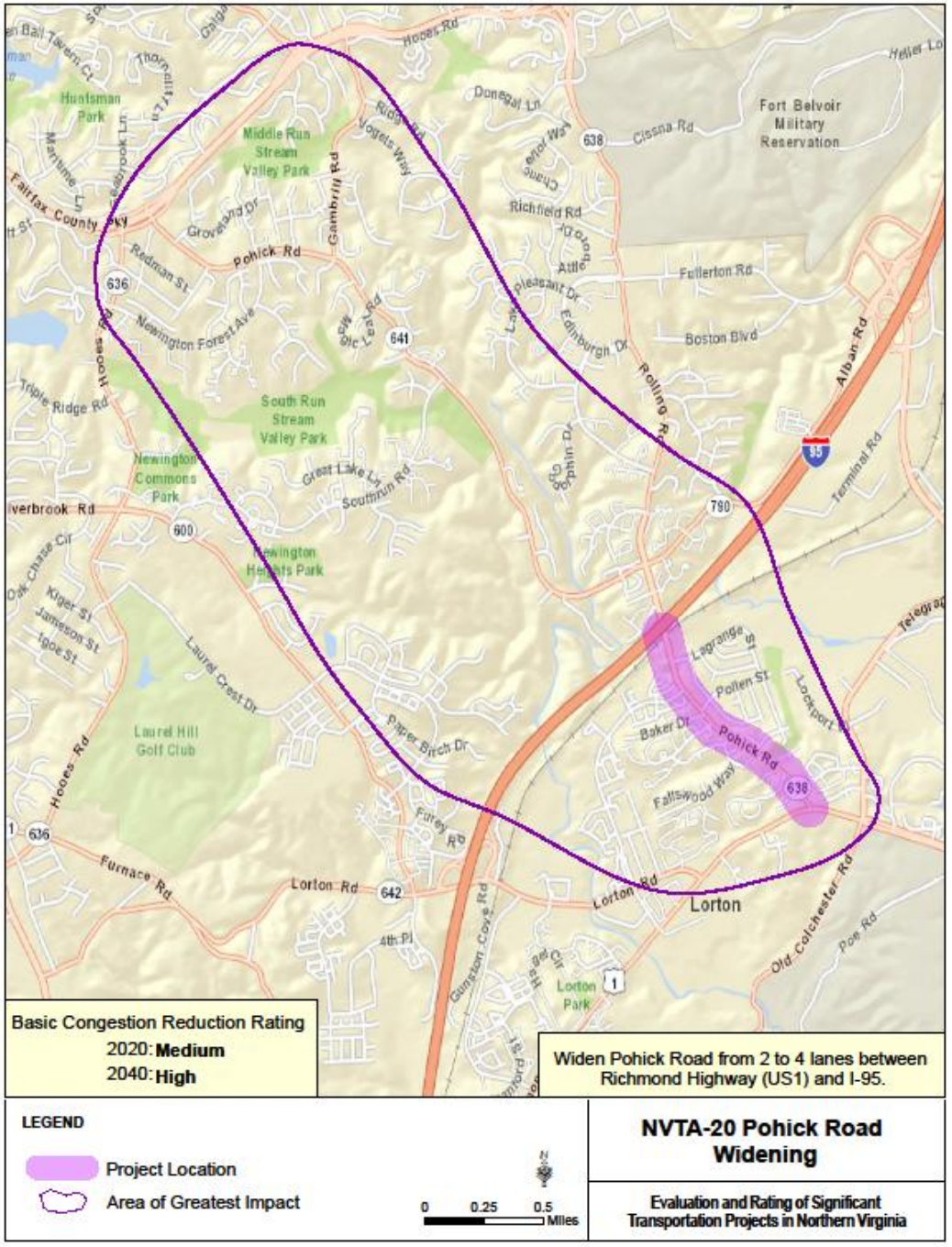
Basic Project Ratings based on Total Scores*

Project Name (* = new facilities)		Location	2020 Rating	2040 Rating
NVTA-1	Columbia Pike Multimodal Streets	Arlington	Low	Low
NVTA-2	Rolling Road Widening	Fairfax	High	High
NVTA-3	US 29 Widening	Fairfax	Medium	Medium
NVTA-4	Braddock Road Widening	Fairfax	Low	Medium
NVTA-5	South Van Dorn St & Franconia Rd Interchange	Fairfax	High	High
NVTA-6	Frontier Dr Extension*	Fairfax	Low	Low
NVTA-7	Fairfax County Pkwy Improvements	Fairfax	High	High
NVTA-8	Belmont Ridge Rd	Loudoun	Low	Low
NVTA-9	Loudoun County Parkway*	Loudoun	High	High
NVTA-10	Route 7 Bridge Widening	Fairfax	Medium	Medium
NVTA-11	US 1 Widening and Relocation - Dumfries	Dumfries	High	High
NVTA-12	US 1 Widening - Fairfax	Fairfax	High	Medium
NVTA-13	Route 15 Bypass/Edwards Ferry Road Interchange	Leesburg	Medium	Low
NVTA-14	Northfax Intersection (US29/50 @ VA123)	City of Fairfax	Low	Low
NVTA-15	Jermantown/US 50 Roadway Improvements	City of Fairfax	Low	Low
NVTA-16	Frying Pan Road Widening	Fairfax	Low	Medium
NVTA-17	Kamp Washington Intersection (US 50/29 @ VA236)	City of Fairfax	Medium	Low
NVTA-18	Real-Time Adaptive Traffic Control & Management	Alexandria	Medium	Medium
NVTA-19	Glebe Rd Corridor ITS Improvements	Arlington	Medium	Medium
NVTA-20	Pohick Road Widening	Fairfax	Medium	High
NVTA-21	Shirley Gate Road Extension*	Fairfax	Low	Low
NVTA-22	Northstar Blvd Extension*	Loudoun	High	High
NVTA-23	Route 7/690 Interchange	Loudoun	High	High
NVTA-24	Route 234/Grant Avenue Reconstruction	Manassas	Low	Medium
NVTA-25	Main St & Maple Ave Intersection	Purcellville	Low	Low
NVTA-26	Route 7/Battlefield Pkwy Interchange	Leesburg	Medium	Medium
NVTA-27	East Elden Street Widening	Herndon	Medium	Low
NVTA-28	Route 1 Widening - Prince William	Prince William	Medium	High
NVTA-29	Route 15 Widening	Prince William	Low	Medium
NVTA-30	Route 28 Widening - Fairfax	Fairfax	High	High
NVTA-31	Route 28 Widening - Prince William	Prince William	Medium	Low
NVTA-32	Route 28 - Godwin Drive Extension*	Manassas/PW	High	High
CTB-1	Route 294 (PW Pkwy) Grade Separation	Prince William	High	Medium
CTB-2	Route 7 Widening	Fairfax	High	High
CTB-3	I-395 Southbound Widening	Alexandria	Low	Low
CTB-4	Fairfax County Pkwy - I-95 to US1	Fairfax	High	High
CTB-5	Fairfax County Pkwy – I 95 to US 1 (County Alt)	Fairfax	Medium	Medium

* Revised since 7/11/14 NVTA-PIWG to reflect revision to analysis of NVTA 11

Project Summary Map Highlights

- Project location
- Description of the project
- Area of greatest impact
- Basic Congestion Reduction Rating – 2020 and 2040



Next Steps

- June 19 – Preliminary Evaluation and Ratings Review By Stakeholders Jurisdiction Representatives
- June 26 – Review responses to stakeholder suggestions for changes to performance measures and rating methods
- June 25-27 – met with each jurisdiction to review project coding and analysis methods
- June 27 – July 8 - Update the 2020 ratings (response to comments) and add the 2040 ratings
- July 11 – NVTA-PIWG – review ratings
- **July 16 – NVTA-TAC meeting – review ratings**
- **July 24 – NVTA meeting – present basic project ratings**
- **November 2014 – Draft detailed ratings**
- **December 2014 – Publish Final detailed ratings**

VDOT
Virginia Department of Transportation

Questions / Comments

THANKS!

Evaluation of Transportation Projects in Northern Virginia Transportation District
Basic Project Evaluation and Rating
July 16, 2014