



# Northern Virginia Transportation Authority

*The Authority for Transportation in Northern Virginia*

## PROJECT IMPLEMENTATION WORKING GROUP

1:00pm, Friday, November 6, 2015

Northern Virginia Transportation Authority

3040 Williams Drive, Suite 200

Fairfax, Virginia 22031

### AGENDA

I. Call to Order/Welcome Chairman Nohe

II. Meeting Summary of October 7, 2015, Meeting  
*Recommended action: Approval [with abstentions  
from those who were not present].*

### Discussion/Information

III. FY2017 Program Mr. Jasper  
i. Congestion Reduction Relative to Cost  
ii. Project Selection Criteria and Weightings

IV. FY2017 Program Policies Ms. Backmon  
i. First Drawdown  
ii. Retroactive Payments

V. CFO Report Mr. Longhi  
i. Updated Appendix Bs  
ii. Request for Insurance Certifications  
iii. SPA workshop

VI. NVTA Update Ms. Backmon

### Adjournment

VII. Adjourn

Next Meeting: TBD (suggested – December 2, 2015)



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## PROJECT IMPLEMENTATION WORKING GROUP

Wednesday, October 7, 2015, 10:30 am

Northern Virginia Transportation Authority

3040 Williams Drive, Suite 200

Fairfax, Virginia 22031

### SUMMARY NOTES

#### I. Call to Order/Welcome

Chairman Nohe

- Ms. Backmon called the meeting to order at 10:43 am.
- Attendees:
  - **PIWG Members:** Chairman Nohe; Chairman Bulova (Fairfax County); Chair Hynes (Arlington County); Council Member Rishell (City of Manassas Park); Rick Canizales, James Davenport (Prince William County); Tom Biesiadny, Karyn Moreland, Noelle Dominguez (Fairfax County); Joe Kroboth, Bob Brown (Loudoun County); Andrew D'huyvetter (Arlington County); Jim Maslanka (City of Alexandria); Paul Stoddard (City of Falls Church); Wendy Block Sanford (City of Fairfax); Patrick Moore (City of Manassas); Mark Duceman (Town of Herndon); Maria Sinner, Valerie Pardo (VDOT); Dan Goldfarb (NVTC); Elena Constantine (TPB); Christine Hoeffner (VRE); Mark Phillips (WMATA).
  - **NVTA Staff:** Monica Backmon (Executive Director); Mike Longhi (CFO); Sree Nampoothiri (Program Coordinator), Keith Jasper (Program Coordinator).
  - **Other Staff:** Mark Thomas (Fairfax County), Kimberly Bibbee (Prince William County).
  - **Other:** Nancy Smith (Northern Virginia Transportation Alliance).

#### II. Meeting Summary of September 16, 2015, Meeting

- Approved, subject to the following change requested by Mr. Kroboth.
  - The group agreed that, for the FY2017 Program, funding will not be provided for preliminary studies/feasibility studies. *Interchange justification reports are considered part of preliminary engineering and, therefore, would be eligible for funding.*

## Discussion/Information

### III. FY2017 Program

Mr. Jasper

- Mr. Jasper informed the group of the two topics for consideration from the previous meeting: estimation of congestion reduction relative to cost methodology and the weighting/definition of project selection criteria.
- Mr. Jasper provided an overview of what was agreed at the previous PIWG meeting, including the following:
  - Continued use of TRANSIMS for the HB 599 evaluation.
  - Studies will be ineligible for funding for the FY2017 Program
  - NVTa staff will propose a draft policy at a future PIWG meeting regarding when projects approved as part of the FY 2017 Program will be required to start drawing down regional revenues. The NVTa policy that requires completion of SPA approval within 6 months of NVTa program approval is in place for the approved FY2015-16 Program and the FY2017 Program. Based on a tentative approval date of July 2016, SPAs will need to be approved by January 2017.
  - The seven HB 599 performance measures used for the FY2015-16 Two Year Program evaluation will again be used for the FY2017 Program, rather than using the HB 2 measures.

#### **Congestion Reduction Relative to Cost Methodology**

- Mr. Jasper explained that the intention is to use a methodology that builds on the FY2015-16 Two Year Program project selection process, complements the NVTa quantitative score, and enhances the overall decision-making process.
- Mr. Jasper navigated the tables and numbers provided to the group, which demonstrate several options for calculating congestion reduction relative to cost. The first table showed these ratios for 2020 and 2040 for the highway projects that were approved in the FY2015-16 Two Year Program. He noted that the scores take the HB 599 output for a single year and combine it with the cost component, for both the funds allocated by NVTa and for the total project cost. Congestion reduction used the selected measure of person hours of delay for 2020 and 2040.
- Mr. Jasper cautioned that calculations were based on a single year (2020 or 2040) regardless of whether the project would be completed in that year; thus, the methodology did not take into account project readiness.
- Mr. Jasper explained how this led to an alternative option, using Examples 1 and 2 provided in the packet. This option calculates congestion reduction relative to cost over a period of time, by extrapolating between 2020 and 2040 using the same measure of person hours of delay used in the previous option. Examples 1 and 2 represent two hypothetical projects; the first is for a lower cost/smaller impact project and the second for a higher cost/higher impact project.
- Mr. Jasper recommended continuing to use the year 2020, as opposed to 2025 or 2030, in conjunction with 2040. This approach minimizes backward extrapolation of

the intermediate numbers. He stated that this approach provides a better understanding of project readiness.

- Mr. Jasper explained that the annual vehicle travel time savings number has been multiplied by \$15 per hour to take the calculation from hours to dollars on an annual basis as a global average of the value of travel time savings.
- Mr. Jasper summarized that this analysis shows that while the bigger projects, which cost more and take more time to implement, result in large reductions in delays the smaller projects may generate more congestion reduction relative to cost. This methodology will provide to the Authority the congestion reduction relative to cost ratio to evaluate alongside with the NVTAs score.
- Mr. Canizales voiced concern that this methodology could disadvantage larger projects because of their cost relative to smaller projects. Mr. Jasper responded that there would not be a disadvantage; it would actually provide more data to develop a recommendation to the Authority.
- Ms. Backmon reminded the group that there are other performance measures being reviewed by the Authority when assessing and making project funding recommendations. She also reminded the group of the need to further define project readiness and that using this methodology will give the group a better idea of when the project is ready and when the project is providing benefits to the network. Ms. Backmon added that the FY2017 Program is a one year program and, based on non-binding project submissions, there are \$750 million in requests for an estimated \$220 million available in PayGo revenue.
- Ms. Hynes pointed out that this methodology has the potential to not only help understand how a project moves people and how that relates to cost, but to also help people understand the relative impact of projects, big and small, in a transparent way.
- Mr. Biesiadny emphasized the importance of presenting the methodology in a way that the public can understand and many PIWG members concurred.
- In response to questions regarding the significance of the final number score determined for congestion reduction relative to cost, Mr. Jasper clarified that the higher the end result number is (the monetized value of the congestion rate divided by the cost), the better the project performs.
- Mr. Biesiadny expressed concern over monetizing fairly; using \$15 per hour, versus \$100 per hour for example, could lead to the debate of what is the value of a person's time, while what is important is the actual hours saved.
- Mr. Kroboth agreed with Mr. Biesiadny and questioned using 2040 as the cutoff date instead of using the project's anticipated lifecycle as the cutoff, considering the project's impact and savings may continue beyond 2040. Mr. Jasper explained that 2040 is the modeling horizon and there is no data beyond that year. Ms. Backmon reminded the group that this is a one year program and funding requests for some projects may be better suited for subsequent programs rather than the FY2017 Program.
- Ms. Backmon informed the group that the information presented at the meeting will be taken to the JACC meeting on October 8, 2015, to address further questions or comments. She asked that the PIWG recommend that the Authority adopt this

congestion reduction methodology along with the weighting criteria at the November 12<sup>th</sup> Authority meeting so that the methodology and criteria is adopted prior to the project submission deadline, informing applicants of what kind of methodology and criteria weightings will be used.

### **Quantitative Score Criteria Weighting**

- Mr. Jasper reviewed weightings used for the FY2015-16 Two Year Program. He explored options to redefine the project readiness criteria, consideration of the weighting used for the congestion reduction criterion, and how to distribute weightings accordingly.
- Mr. Jasper provided the results of sensitivity testing to demonstrate how modest changes to the congestion reduction weighting would have affected NVTA quantitative scores and project rankings of the candidate highway projects for the FY2015-16 Program.
- For Tests A, B, and C, the quantitative scores were recalculated for each highway project based upon different weightings. Test A increased the congestion weighting from 35% to 45%, kept one Project Readiness criteria at 15%, with the other Project Readiness at 0%; while Test B calculated 55% Congestion Relief/5% Project in Advanced Phase/0% Project Able to Be Implemented; and Test C was a variation of Test A with 45% Congestion Relief/15% Project in Advanced Phase/0% Project Able to Be Implemented and, in addition, eliminated the Urgency criteria and transferred those 5 points to the Improved Bike/Ped criteria for a new weighting of 10%.
- The tests resulted in the top three projects and bottom four projects remaining unchanged, albeit with minor shuffling in the rankings. Mr. Jasper pointed out that the three tests mostly affected rankings in the middle of the table. In particular, the Herndon East Elden Street Improvements and Widening project (ranked 15) and the Fairfax Braddock Road HOV Widening (ranked 19) flipped rankings in Test B so that the Braddock Road project moved into competitive range while the Herndon East Eldon Street project moved out of competitive range. He added that if a different group of projects were evaluated, especially if there were not as many projects, the changes in the scores might have been more dramatic.
- Chairman Nohe reminded the group that, because the Commonwealth Transportation Board (CTB) established a higher Congestion Relief weighting for the HB 2 process, it is important to re-evaluate this weighting for the FY2017 Program. He cautioned against making a decision about whether the process is sufficiently robust based on the test examples provided because the projects tested were from the previously approved FY2015-16 Two Year Program. For the FY2017 Program, it will be a mostly different group of projects. Chairman Nohe did not think the examples determine whether there is benefit to big or small projects, highway versus transit, inside the beltway versus outside the beltway, etc.
- Mr. Biesiadny also pointed out that the top 10 and bottom 10 projects remained top and bottom 10 with only a few exceptions. Mr. Canizales cautioned that there will be more disparity between the numbers once the criteria weightings are redefined.
- Ms. Hynes asked the group to consider the importance of land use. She pointed out that, while there are places in the region where throughput of people and vehicles is the priority, those inside the Beltway where costs are higher and there is limited land

use such as Arlington, Alexandria, and Falls Church, have very different challenges for moving more people on streets that are more difficult to expand, in places with limited room for bus bays, and with the added need to fund and operate transit services. Council Member Rishell agreed with Ms. Hynes and echoed the importance of emphasizing connectivity and congestion relief.

### **Redefinition of Project Readiness**

- Mr. Jasper presented the proposed redefinition of Project Readiness and the associated High, Medium, and Low criteria. He specified that a High score would be given to projects that, as a result of the FY17 Program, will be fully operational once the money has been spent; the Medium score would be given to projects still in a phase of construction or right of way acquisition; and the Low score would be given to projects advancing to preliminary engineering or design activities.
- Mr. Canizales pointed out that the right-of-way phase and the construction phase could mean years of differential and that, if a project is in the construction phase, it is usually set up for completion within 2 years and should be given a High score. The group discussed alternative definitions of High versus Medium scores for entering the construction phase. Chairman Nohe reminded the group that, in the context of a one-year program, there will not be partial funding of construction as construction of the project will be fully-funded.
- It was determined by the group that if the project can qualify for construction, it will be scored High. Mr. Canizales suggested rewording the High category to say: “Project will be fully open/operational as a result of FY2017 Program funding or allow project to be advertised for construction” and he suggested possibly specifying “...partial-year construction funding” in the Medium category.
- Mr. Canizales recommended that Congestion Reduction be weighted at 50% and Project Readiness stay at 10%. Ms. Backmon responded that the JACC will discuss the information presented and the PIWG will meet to discuss recommendations from the JACC to determine final recommendations prior to the November 12<sup>th</sup> NVTA meeting.
- Ms. Maria Sinner notified the group that, for the HB 2 process, 46 applications have been received from Northern Virginia, five of which are transit projects worth \$2 billion; and \$7 billion in statewide applications have been received, not including I-66 inside the Beltway.

### **IV. Finance Committee Report**

Mr. Longhi

- Mr. Longhi informed the group that requests will be sent to jurisdictions for updates to the Appendix B component of the executed SPAs for cash-flow and project analysis purposes along with requests for insurance certifications for project insurance policies; jurisdictions will have through November 30, 2015, to submit this information.

**V. NVTA Update**

Ms. Backmon

- Ms. Backmon informed the group that the October 22 NVTA meeting has been canceled and the next NVTA meeting is scheduled for November 12, 2015. The NVTA will be asked to adopt resolutions regarding HB2 project submissions at this meeting.
- Ms. Backmon announced that the I-66 Outside the Beltway Committee has endorsed the resolution for considering projects within the I-66 Outside the Beltway Corridor after these projects undergo the Authority's process. Adoption of this resolution will be recommended at the November 12<sup>th</sup> Authority meeting.
- Due to the NVTA meeting cancellation, the 6-month deadline for signed and approved SPAs will now be November 12, 2015. There are 12 outstanding SPAs for which localities and agencies need to contact Ms. Backmon to provide updates if they are unable to meet the deadline.

**Adjournment**

**VI. Adjourn**

- The meeting adjourned at 12:28 p.m.
- The next PIWG meeting was scheduled for 1:00 p.m. on Friday, November 6, 2015 at NVTA

# FY2017 Program: Project Selection Process

## Updated Recommendation



Presentation to the Project Implementation Working Group

November 6, 2015

Northern Virginia  
Transportation Authority  
*The Authority for Transportation in Northern Virginia*



# Tentative Schedule

- Sept. 25 thru 5pm Nov. 30: Call for Projects
- **Nov. 12: NVTA approves project selection process**
- Dec. 10: NVTA approves candidate project list (for HB 599 and NVTA evaluations)
- April 2016: Project evaluations complete
- May 2016: NVTA approves draft project list (for public comment)
- June 2016: Public Hearing and Town Halls
- July 2016: NVTA adopts FY2017 Program, **and related policy for approved projects (first drawdown by end of FY2019)**



# Recap of 9/16/2015 PIWG Meeting

- Continue to use TRANSIMS
  - Need to confirm evaluations for 2020 and 2040
- Studies ineligible for FY2017 Program
- First drawdown of FY2017 Program funds must occur before FY2020
  - Need to develop policy
- Retain the seven HB 599 measures
  - Review possible changes for FY2018 and beyond as part of TransAction Update



# Recap of 10/7/2015 PIWG Meeting

- Continued to review
  - Methodology for congestion reduction relative to cost
  - Project selection criteria weightings
    - Re-definition of project readiness criteria
- Requested review by JACC (10/8/2015)



# FY2017 Program: Overview of Project Selection Process

- Preliminary Screening
  - Pass/fail
  - Screening for funding eligibility criteria (NEW)
- NVTA Quantitative Score
  - Incorporates HB 599 rating for ALL projects
- Ratio of Congestion Reduction Relative to Cost (CRRC)
  - Total project cost
  - FY2017 funding request ('NVTA Share')
- Qualitative Considerations



# Definition: NVTA Quantitative Score

- A composite score for each project based on nine (proposed) project selection criteria.
- Each criterion and associated weighting reflects NVTA's priorities – congestion reduction being the most important with a (proposed) weight of 45%.
- The congestion reduction criterion is scored using the project's HB 599 project rating for 2040, as calculated by VDOT. All other criteria are scored using a high, medium, or low scale.
- The NVTA Quantitative Score ranges from 0 to 100; the higher the number, the better the project



# Definition: Congestion Reduction Relative to Cost (CRRC) Ratio

- The CRRC ratio for each project reflects its impact on congestion relative to its total cost.
- NVRTA is legally required to give priority to projects based on this ratio.
- The CRRC ratio is calculated by dividing
  - Net present value of the total travel time saved as a result of the project (from opening year thru 2040) by
  - Net present value of the cost of designing and building the project.
- The CRRC ratio for each project will be greater than zero; the higher the number, the better the project



# NVTA Quantitative Score: recap

- PIWG initiated a review of FY2015-16 project selection criteria for FY2017 Program
- Analysis presented at the 10/7/2015 PIWG meeting indicated that project rankings likely to be relatively insensitive to modest changes in criteria weightings
- PIWG requested JACC review
- JACC recommendation – Test C



# Quant. Score: Criteria Weighting

## FY2015-16

- Congestion Reduction: 35%
- Project Readiness\*: 25%
- Urgency: 5%
- Reduce VMT: 5%
- Safety: 5%
- Connectivity\*: 10%
- Improved Bike/Ped: 5%
- Management/Ops: 5%
- Cost Sharing: 5%

## Proposed FY2017 (Test C)

- Congestion Reduction: 45%
- Project Readiness+: 15%
- Urgency: 0%
- Reduce VMT: 5%
- Safety: 5%
- Connectivity\*: 10%
- Improved Bike/Ped: 10%
- Management/Ops: 5%
- Cost Sharing: 5%

Notes: \* two criteria

+ reduced to one, redefined, criterion





# Redefinition of 'Project Readiness'

- FY2015-16 Program
  - Project is in advanced phase of development (15%)
    - **High:** Project is in the ROW or construction phase
    - **Medium:** Project is in the design phase
    - **Low:** Project is in the study or planning phase
  - Project is able to be readily implemented (10%)
    - **High:** Project can be implemented in the near term (<6 years)
    - **Medium:** Project can be implemented in the short term (6-12 years)
    - **Low:** Project can be implemented in the long term (>12 years)



# Redefinition of 'Project Readiness'

- JACC Recommendation for FY2017 Program
  - Project will be advanced as a result of FY2017 Program funding (Recommended weighting 15%)
    - **High:** Project will be fully open/operational as a result of FY2017 Program funding (includes acquisition of buses)
    - **Medium:** Project will advance to the ROW or partial construction phase as a result of FY2017 Program funding
    - **Low:** Project will advance to the preliminary engineering or design phase as a result of FY2017 Program funding



# Congestion Reduction Relative to Cost: recap

- PIWG initiated a review of an updated approach that:
  - Complements the NVRTA quantitative score
  - Enhances decision making
- PIWG requested JACC review
- JACC considered two approaches:
  - Travel time savings versus cost
  - CRRC ratio
- JACC recommendation – ‘hung’



# Proposed Congestion Reduction Relative to Cost Methodologies

- Common inputs
  - 2020 and 2040 person hours of delay reductions for each candidate project (HB 599 output from TRANSIMS)
  - Annual conversion factor for travel time savings
  - Project costs (total project cost and requested 'NVRTA share' from FY2017 Program)
- CRRC ratio additional inputs
  - Hourly value of time (averaged for the NoVA region)
  - Discount rate to be applied to costs and monetized annual travel time savings



# Proposed Congestion Reduction Relative to Cost Methodologies

- Outputs
  - Total travel time savings (thru 2040) per unit of cost, i.e. hours saved per dollar
  - Value of total travel time savings (thru 2040) per unit of cost, i.e. CRRC ratio without units
- The higher the number, the better the project



# Proposed Congestion Reduction Relative to Cost Methodology

- Common features

- Evaluation period will be thru 2040, not just a single year
- Travel time savings cannot be accrued prior to the anticipated year of opening or after 2040
- Travel time savings will be extrapolated using the 2020 and 2040 outputs from TRANSIMS for a single HB 599 measure ‘person hours of delay’
- Preference for using total project cost, not ‘NVRTA share’ of project cost

- CRRC ratio additional features

- Value of travel time (VTT) savings and costs will be allocated to the year in which they occur and will be ‘discounted’ prior to summation
- CRRC ratios  $< 1.0$  indicate value of congestion reduction less than project cost



# Proposed Congestion Reduction Relative to Cost Methodology

- JACC comments on both methodologies
  - Why cap analysis at 2040?
  - Will the impacts of a bus acquisition project continue beyond the life of the NVRTA-funded buses?
- JACC comments on CRRC ratio methodology
  - Difficult to understand and explain to others (discounting, net present value concepts)
  - Standard approach for evaluating financial investments
  - De-emphasize monetization
  - Appropriate value of time for NoVA?
  - Appropriate discount rate?



# Other Considerations

- Methodology for evaluating selected projects:
  - Small projects
  - Alternate modes
- What if more than 25 projects are submitted?
  - Grouping of projects
  - Project selection model





# Background Slides

- Presented at PIWG meeting on 10/7/2015



# Congestion Reduction Relative to Cost

Project Name (* = new facilities)	Location	NVTA FY2015-16 Funds (\$M)	Total Project Cost (\$M)	Reduce Person Hours of Delay (2020)	Congestion Relief relative to NVTA FY2015-16 Funds (2020)	Congestion Relief relative to Total Cost (2020)	Reduce Person Hours of Delay (2040)	Congestion Relief relative to NVTA FY2015-16 Funds (2040)	Congestion Relief relative to Total Cost (2040)
Glebe Rd Corridor ITS Improvements	Arlington	\$ 2.0	\$ 2.0	(2,169)	1,084.7	1084.7	(1,839)	919.6	919.6
Loudoun County Parkway extension to US 50*	Loudoun	\$ 31.0	\$ 51.0	(18,638)	601.2	365.4	(27,219)	878.0	533.7
Route 28 Widening near Centreville	Fairfax	\$ 5.0	\$ 47.4	(9,136)	1,827.1	192.9	(15,805)	3,161.1	333.8
Rolling Road Widening near Springfield	Fairfax	\$ 5.0	\$ 35.2	(5,163)	1,032.5	146.7	(6,767)	1,353.4	192.2
Route 28 Widening near Manassas	Manassas/PW	\$ 20.0	\$ 29.5	(393)	19.7	13.3	(5,599)	280.0	189.5
US 1 Widening and Relocation - Dumfries	Dumfries	\$ 6.9	\$ 82.5	(2,343)	339.6	28.4	(14,415)	2,089.2	174.7
Kamp Washington Intersection (US 50/29 @ VA236)	City of Fairfax	\$ 1.0	\$ 9.8	(606)	605.5	61.8	(1,655)	1,655.2	168.9
Fairfax County Pkwy Improvements	Fairfax	\$ 10.0	\$ 396.1	(17,236)	1,723.6	43.5	(53,175)	5,317.5	134.2
US 1 Widening near Woodbridge	Prince William	\$ 49.4	\$ 52.4	(1,993)	40.4	38.0	(6,356)	128.7	121.3
Columbia Pike Multimodal Streets in Arlington	Arlington	\$ 10.0	\$ 82.5	(1,134)	113.4	13.7	(6,952)	695.2	84.3
Route 7 Bridge Widening near Tysons Corner	Fairfax	\$ 13.9	\$ 34.4	(2,571)	185.0	74.7	(2,796)	201.1	81.3
Jermantown/US 50 Roadway Improvements	City of Fairfax	\$ 1.0	\$ 6.5	(376)	376.0	57.8	(425)	424.8	65.4
Route 28 - Godwin Drive Extension near Manassas*	Manassas/PW	\$ 2.5	\$ 400.0	(10,858)	4,343.1	27.1	(21,820)	8,727.9	54.5
US 1 Widening near Ft. Belvoir	Fairfax	\$ 1.0	\$ 90.0	(1,492)	1,492.2	16.6	(3,569)	3,569.0	39.7
Route 15 Bypass/Edwards Ferry Road Interchange	Leesburg	\$ 1.0	\$ 50.0	(964)	964.2	19.3	(1,469)	1,469.1	29.4
Belmont Ridge Rd widening near Broadlands	Loudoun	\$ 19.5	\$ 35.9	(566)	29.0	15.8	(1,035)	53.1	28.9
Route 7/Battlefield Pkwy Interchange	Leesburg	\$ 13.0	\$ 58.0	(1,538)	118.3	26.5	(858)	66.0	14.8
Frontier Dr Extension in Springfield*	Fairfax	\$ 2.0	\$ 84.5	(57)	28.5	0.7	(594)	297.0	7.0
Northfax Intersection (US29/50 @ VA123)	City of Fairfax	\$ 10.0	\$ 25.0	(72)	7.2	2.9	(91)	9.1	3.6
East Elden Street Widening in Herndon	Herndon	\$ 10.4	\$ 30.9	(60)	5.8	1.9	(106)	10.2	3.4



# Proposed Approach - Example #1

	Year	Person Hours of Delay			Daily	Annual	Annual	Annual	Project costs NVTA Only	Project costs NVTA Only Discounted
		Before	After	Diff.	Adjusted Hours	Adjusted Hours	VTT Savings	VTT Savings Discounted		
						260	\$15.00	4.40%		4.40%
0	2016				0	0	\$0	\$0		\$0
1	2017	211,805	207,174	4,631	0	0	\$0	\$0	\$1,750,000	\$1,676,245
2	2018	213,248	208,664	4,585	4,585	1,191,970	\$17,879,550	\$16,404,220		\$0
3	2019	214,692	210,153	4,538	4,538	1,179,945	\$17,699,175	\$15,554,338		\$0
4	2020	216,135	211,643	4,492	4,492	1,167,920	\$17,518,800	\$14,746,955		\$0
5	2021	217,578	213,133	4,446	4,446	1,155,895	\$17,338,425	\$13,979,999		\$0
6	2022	219,022	214,622	4,400	4,400	1,143,870	\$17,158,050	\$13,251,497		\$0
7	2023	220,465	216,112	4,353	4,353	1,131,845	\$16,977,675	\$12,559,569		\$0
8	2024	221,908	217,601	4,307	4,307	1,119,820	\$16,797,300	\$11,902,426		\$0
9	2025	223,352	219,091	4,261	4,261	1,107,795	\$16,616,925	\$11,278,366		\$0
10	2026	224,795	220,581	4,215	4,215	1,095,770	\$16,436,550	\$10,685,766		\$0
11	2027	226,238	222,070	4,168	4,168	1,083,745	\$16,256,175	\$10,123,085		\$0
12	2028	227,682	223,560	4,122	4,122	1,071,720	\$16,075,800	\$9,588,852		\$0
13	2029	229,125	225,049	4,076	4,076	1,059,695	\$15,895,425	\$9,081,669		\$0
14	2030	230,569	226,539	4,030	4,030	1,047,670	\$15,715,050	\$8,600,205		\$0
15	2031	232,012	228,029	3,983	3,983	1,035,645	\$15,534,675	\$8,143,192		\$0
16	2032	233,455	229,518	3,937	3,937	1,023,620	\$15,354,300	\$7,709,426		\$0
17	2033	234,899	231,008	3,891	3,891	1,011,595	\$15,173,925	\$7,297,758		\$0
18	2034	236,342	232,497	3,845	3,845	999,570	\$14,993,550	\$6,907,096		\$0
19	2035	237,785	233,987	3,798	3,798	987,545	\$14,813,175	\$6,536,401		\$0
20	2036	239,229	235,477	3,752	3,752	975,520	\$14,632,800	\$6,184,683		\$0
21	2037	240,672	236,966	3,706	3,706	963,495	\$14,452,425	\$5,851,002		\$0
22	2038	242,115	238,456	3,660	3,660	951,470	\$14,272,050	\$5,534,462		\$0
23	2039	243,559	239,945	3,613	3,613	939,445	\$14,091,675	\$5,234,210		\$0
24	2040	245,002	241,435	3,567	3,567	927,420	\$13,911,300	\$4,949,436		\$0
<b>Total thru horizon year</b>					<b>93,742</b>	<b>24,372,985</b>	<b>\$365,594,775</b>	<b>\$222,104,613</b>	<b>\$1,750,000</b>	<b>\$1,676,245</b>
Total project cost including non-NVTA Sources									\$1,750,000	
<b>Congestion Relief relative to Cost (NVTA share only)</b>										<b>132.50</b>



# Proposed Approach - Example #2

	Year	Person Hours of Delay			Daily Adjusted Hours	Annual Adjusted Hours	Annual VTT Savings	Annual VTT Savings Discounted	Project costs NVTA Only	Project costs NVTA Only Discounted
		Before	After	Diff.						
						260	\$15.00	4.40%		4.40%
0	2016				0	0	\$0	\$0		\$0
1	2017				0	0	\$0	\$0	\$1,000,000	\$957,854
2	2018				0	0	\$0	\$0	\$2,000,000	\$1,834,970
3	2019	279,897	210,601	69,296	0	0	\$0	\$0	\$10,000,000	\$8,788,171
4	2020	289,338	216,109	73,229	0	0	\$0	\$0	\$155,000,000	\$130,475,720
5	2021	298,780	221,617	77,162	0	0	\$0	\$0	\$125,000,000	\$100,787,697
6	2022	308,221	227,126	81,095	0	0	\$0	\$0	\$35,000,000	\$27,031,183
7	2023	317,663	232,634	85,028	85,028	22107397	\$331,610,955	\$245,315,720		\$0
8	2024	327,104	238,142	88,962	88,962	23130016	\$346,950,240	\$245,846,032		\$0
9	2025	336,546	243,651	92,895	92,895	24152635	\$362,289,525	\$245,895,901		\$0
10	2026	345,987	249,159	96,828	96,828	25175254	\$377,628,810	\$245,504,882		\$0
11	2027	355,429	254,667	100,761	100,761	26197873	\$392,968,095	\$244,710,050		\$0
12	2028	364,870	260,176	104,694	104,694	27220492	\$408,307,380	\$243,546,137		\$0
13	2029	374,312	265,684	108,627	108,627	28243111	\$423,646,665	\$242,045,665		\$0
14	2030	383,753	271,193	112,561	112,561	29,265,730	\$438,985,950	\$240,239,071		\$0
15	2031	393,195	276,701	116,494	116,494	30,288,349	\$454,325,235	\$238,154,822		\$0
16	2032	402,636	282,209	120,427	120,427	31,310,968	\$469,664,520	\$235,819,533		\$0
17	2033	412,078	287,718	124,360	124,360	32,333,587	\$485,003,805	\$233,258,065		\$0
18	2034	421,519	293,226	128,293	128,293	33,356,206	\$500,343,090	\$230,493,631		\$0
19	2035	430,961	298,734	132,226	132,226	34,378,825	\$515,682,375	\$227,547,890		\$0
20	2036	440,402	304,243	136,159	136,159	35,401,444	\$531,021,660	\$224,441,035		\$0
21	2037	449,844	309,751	140,093	140,093	36,424,063	\$546,360,945	\$221,191,878		\$0
22	2038	459,285	315,259	144,026	144,026	37,446,682	\$561,700,230	\$217,817,932		\$0
23	2039	468,727	320,768	147,959	147,959	38,469,301	\$577,039,515	\$214,335,488		\$0
24	2040	478,168	326,276	151,892	151,892	39,491,920	\$592,378,800	\$210,759,684		\$0
<b>Total thru horizon year</b>					<b>2,132,284</b>	<b>554,393,853</b>	<b>\$8,315,907,795</b>	<b>\$4,206,923,418</b>	<b>\$328,000,000</b>	<b>\$269,875,596</b>
Total project cost including non-NVTA Sources									\$500,000,000	
<b>Congestion Relief relative to Cost (NVTA share only)</b>										<b>15.59</b>



# Quant. Score: Sensitivity Tests

ID	Jurisdiction/ Agency	Project Name (Highway Projects Only)	Phase Funded	HB 599 Ratings (2040)	35-15-10 (see note 1)	Rank	TEST A 45-15-0 (see note 2)	Rank	TEST B 55-5-0 (see note 3)	Rank	TEST C 45-15-0 (see note 4)	Rank
2C	Loudoun	Loudoun County Parkway (VA Route 607) – U.S. 50 to Creighton Rd.	Construction	30.6	64.0	1	57.1	2	50.2	2	55.4	2
3H	Manassas	Route 28 (Manassas Bypass) Study - Godwin Drive Extension	Study	29.3	55.3	2	48.2	3	47.8	3	46.5	3
5B	Fairfax	Fairfax County Parkway Improvements (Study)	Preliminary Eng.	88.5	54.3	3	59.8	1	65.3	1	58.2	1
9F	Arlington	Glebe Road Corridor Intelligent Transportation System (ITS) Improvements	Construction	8.6	53.0	4	43.9	4	34.7	7	40.5	11
6H	City of Fairfax	Kamp Washington Intersection Improvements	Construction	3.5	52.9	5	43.2	5	33.6	10	43.2	5
8P	Prince William	Route 1 Widening from Featherstone Road to Marys Way	Construction	10.8	52.1	6	43.2	5	37.6	4	43.2	5
6I	City of Fairfax	Northfax - Intersection and drainage improvements at Route 29/50 and Route 123	Construction	0.2	51.7	7	41.8	8	31.8	12	41.8	8
9G	Arlington	Route 244 Columbia Pike Street Improvements (S. Gate Road to the Pentagon)	Construction	9.2	51.6	8	42.5	7	36.7	5	45.8	4
IL	Leesburg	Route 7 (East Market Street)/Battlefield Parkway Interchange	Final Design	1.8	50.6	9	40.8	9	34.3	9	40.8	10
IM	Fairfax	Route 7 Widening – Dulles Toll Road Bridge	Construction	4.6	49.9	10	40.4	11	30.9	14	42.1	7
3I	Manassas	Route 28 Widening South to the City Limits	Construction	8.7	49.7	11	40.6	10	34.8	6	38.9	12
2D	Loudoun	Belmont Ridge Road (VA Route 659)- Turo Parish Road to Croson Ln	Construction	3.0	49.4	12	39.7	12	30.0	16	41.4	9
6J	City of Fairfax	Jermantown / Route 50 Roadway Improvements	Construction	1.3	48.8	13	38.9	13	29.0	18	37.3	14
3J	Prince William	Route 28 Widening from Route 234 Bypass to Linton Hall Road	Construction	8.7	48.0	14	38.9	13	33.1	11	37.2	15
8Q	Dumfries	Widen Route 1 (Fraleay Boulevard) Brady's Hill Road to Route 234 (Dumfries Road)	Preliminary Eng.	14.6	45.1	15	36.6	15	34.7	8	36.6	16
1N	Herndon	East Elden Street Improvements & Widening Project (UPC 50100)	ROW	0.3	45.1	15	35.1	16	28.5	19	38.5	13
6Q	Prince William	Route 15 Widening (Route 29 to Route 55), including RR Overpass	Construction	0.5	40.2	17	30.2	22	26.9	20	31.9	19
8R	Fairfax	Frontier Drive Extension & Braided Ramps	Preliminary Eng.	2.6	39.2	18	32.8	18	26.4	21	34.5	17
9H	Fairfax	Braddock Road HOV Widening	Study	6.8	39.0	19	33.1	17	30.4	15	31.4	20
1P	Leesburg	Route 15 Bypass at Edwards Ferry Road Interchange	Preliminary Eng.	1.9	39.0	19	32.5	20	29.4	17	32.5	18
9I	Alexandria	Real-Time Adaptive Traffic Control and Data Management System	Study	4.6	34.9	21	28.7	23	25.9	22	27.1	23
3K	Fairfax	VA Route 28 Widening (Prince William County Line to Route 29)	Preliminary Eng.	17.3	34.4	22	32.8	19	31.2	13	29.5	21
5C	Fairfax	Rolling Road Widening from Old Keene Mill Road to Franconia Springfield Pkwy	ROW	12.5	32.7	23	30.6	21	25.2	23	29.0	22
7B	Fairfax	South Van Dorn Street and Franconia Road Interchange	Preliminary Eng.	3.1	31.1	24	24.7	26	21.7	26	21.4	26
8S	Fairfax	US 1 Richmond Highway (from Mt. Vernon Memorial Highway to Napper Road)	Preliminary Eng.	12.0	29.2	25	27.1	24	24.9	24	25.4	24
6K	Fairfax	US 29 Lee Highway (from west of Union Mill Road to Buckley's Gate Drive)	Study	9.3	28.3	26	25.9	25	23.4	25	22.5	25
3L	Fairfax	Frying Pan Road (VA 28 to Centreville Road)	Study	2.7	25.9	27	22.9	27	19.8	27	19.5	27



# Quant. Score: Sensitivity Tests (Notes)

- 1) Original NVTA Quantitative Scores for FY2015-16 Two Year Program (35% Congestion Relief, 15% Project in Advanced Phase of Development, 10% Project able to be Readily Implemented)
- 2) TEST A - Adjusted NVTA Quantitative Scores for FY2015-16 Two Year Program (45% Congestion Relief, 15% Project in Advanced Phase of Development, 0% Project able to be Readily Implemented)
- 3) TEST B - Adjusted NVTA Quantitative Scores for FY2015-16 Two Year Program (55% Congestion Relief, 5% Project in Advanced Phase of Development, 0% Project able to be Readily Implemented)
- 4) TEST C - Adjusted NVTA Quantitative Scores for FY2015-16 Two Year Program (45% Congestion Relief, 15% Project in Advanced Phase of Development, 0% Project able to be Readily Implemented, 0% Urgency, 10% Bike/Ped)
- 5) Projects highlighted in red were not included in adopted FY2015-16 Two Year Program
- 6) 'Phase Funded' indicates most advanced phase for which NVTA regional funds will be used - some projects are currently in an earlier phase
- 7) Transit projects are excluded from this analysis as they were not subject to HB 599 evaluation for FY2015-16 Two Year Program

