Northern Virginia Transportation Authority
The Authority for Transportation in Northern Virginia

TECHNICAL ADVISORY COMMITTEE
Wednesday, April 19, 2017, 7:00pm
NVTA Office
3040 Williams Drive, Suite 200
Fairfax, Virginia 22031

AGENDA

I. **Call to Order/Welcome** — Chairman Boice

Action

II. **Approve Summary Notes of February 15, 2017 Meeting**
Recommended Action: Approval [with abstentions from those who were not present]

III. **Approve Six-Year Program Framework**
Recommended Action: Approval

Discussion/Information

IV. **NVTA Update** — Ms. Backmon, Executive Director

V. **TransAction Baseline Analyses** — Mr. Jasper, Principal, Transportation Planning & Programming

Adjournment

VI. **Adjourn**

Next Meeting: May 17, 2017
7:00pm
NVTA Office

Northern Virginia Transportation Authority
The Authority for Transportation in Northern Virginia

TECHNICAL ADVISORY COMMITTEE
Wednesday, February 15, 2017, 7:00pm
NVTA Office
3040 Williams Drive, Suite 200
Fairfax, Virginia 22031

SUMMARY NOTES

I. Call to Order/Welcome Mr. Boice

- Mr. Boice called the meeting to order at 7:05pm.
- Attendees:
  - Members: Agnes Artemel; Randy Boice; Armand Ciccarelli; Doug Fahl; Meredith Judy; Kathy Ichter; Pat Turner.
  - NVTA Staff: Monica Backmon (Executive Director, NVTA); Michael Longhi (CFO, NVTA); Keith Jasper (Principal, Transportation Planning and Programming); Sree Nampoothiri (Transportation Planner).
  - Other: Kristin Calkins (Fairfax County); James Davenport (Prince William County).

Action

II. Meeting Summary of January 18, 2017 Mr. Boice

- Mr. Fahl moved approval of the January 18, 2017 meeting summary; seconded by Ms. Ichter. The motion carried unanimously with abstentions from those who were not present at the January meeting.

Discussion/Information

III. NVTA Update Ms. Backmon

- Ms. Backmon informed the Committee members that the Authority met on February 9, 2017, and approved the weightings of TransAction performance measures. Further, she informed that there was a media event earlier in the day to provide to announce the follow up tracking survey carried out in Fall 2016, which showed an upbeat mood among the public about transportation in the region. She added that a link to the survey results can be send to the Committee.

IV. Development of Six Year Program Framework — Mr. Jasper

- Mr. Jasper introduced seven topics with a number of questions for the Committee to consider in the context of moving from preparing a plan to programming the funds.

TOPIC 1: Call for projects

TransAction will identify the best performing multimodal packages at the corridor segment level, not individual projects on a standalone basis. Programming will consider projects/smaller groups of projects for funding in the 2018-2023 Six Year Program (SYP). In the past, programming has been preceded by a Call for Projects. Is there an appropriate role for a Call for Projects for the SYP, perhaps with an emphasis on project readiness? If a Call for Projects approach is used, how frequently should it be made? Alternatively, would a collaborative approach to identify candidate regional projects for inclusion in the SYP based on the corridor-based analysis in TransAction be preferable? If a collaborative approach is utilized instead of a Call for Projects, how will jurisdictional and agency buy-in be ensured?

- Ms. Backmon noted that the technical analysis needs to be balanced with ownership, e.g. Expansion of the American Legion Bridge might be a great project for reducing congestion in the region, but the State of Maryland will have to take the lead.
- Mr. Boice opined that a combination of a collaborative approach of technical analysis and call for projects will be the best solution.
- Ms. Artemel enquired about the downside of having no Call for Projects. Mr. Jasper informed that many projects that will require a collaborative effort will need to be pushed out to the outer years.
- Ms. Ichter suggested the need to work with agencies and jurisdictions to come up with regional priority projects instead of equally distributing funds geographically. She agreed with Mr. Boice that a combination is the best option.
- Both Ms. Ichter and Mr. Fahl argued that the NVTA should not spend regional funds on interstates even though facilities such as I-66 might be performing as a regional connection within the NOVA region, as that should the responsibility of federal and state agencies.
- Ms. Backmon reminded that the NVTA cannot fund projects such as the American Legion Bridge that are outside the NOVA region.
- Mr. Fahl agreed that a combination of a collaborative approach and a call for projects would be the best. However, he noted that the selection process should be driven by the NVTA staff and not jurisdictional Capital Improvement Plans (CIP).

TOPIC 2: Focus on corridors performance vs project performance

Future travel conditions on corridors and corridor segments will vary across the region. To what extent should programming focus be on the corridors and corridor segments with the worst forecasted congestion, versus the highest performing projects? How will geographic and modal balance be ensured?

- Ms. Judy opined that the top ranking projects must be selected since those rankings are based on comprehensive analysis of the entire region.
- Mr. Boice and Mr. Fahl suggested that the process is comprehensive and therefore, let the process flush out the best projects and/or combination of projects.

TOPIC 3: Performance Targets

Targets can be used as a policy tool to set an expectation of how the regional transportation system will perform in the future. Such a policy may require the Authority to set targets. Alternatively, targets can be used as an internal mechanism to prioritize and/or help to manage expectations of what can be achieved. NVTA's recent Tracking Survey has indicated that a Travel Time Index of 1.5 is the maximum level for commuting that is acceptable to Northern Virginians who drive to work. Should TransAction incorporate targets and, if so, how should they be used? What are appropriate targets for the region? What happens when targets are not met?

- Ms. Ichter opined that developing targets for performance measures will require a large amount of time and effort, which may not be the most critical and appropriate use of resources.
- Ms. Turner suggested that the targets may not be realistic depending on the changing levels of population and employment in the region.

TOPIC 4: Funding of Studies

NVTA has funded studies in the past using regional revenues, although NVTA staff preference is to only fund studies with a regional scope. Under what circumstances should TransAction include studies and how should they be evaluated given studies alone do not result in congestion reduction? Connected/Automated Vehicle technologies offer the potential to reduce non-recurrent congestion caused by crashes. Should TransAction include pilot CAV deployments and how should they be evaluated?

- Mr. Boice opined that studies should not be funded as it is the burden of the jurisdiction/agency to come up with a solution that can be funded.
- Ms. Judy and Ms. Artemel suggested that studies could be funded if they are truly regional in nature.
- Mr. Boice elaborated that studies are viewed as fully implementing the potential solutions and, therefore, analyzed as such during the scoring process. However, the study may come up with a solution that was not analyzed or the study could conclude that none of the alternatives are feasible.
- The Committee agreed that in general studies should not be funded unless they are truly regional in nature.

TOPIC 5: Leveraging NVTA funds for federal funds

NVTA has previously taken non-NVTA funding sources into account in its project selection process. External funding sources increase the likelihood that such projects will be allocated regional revenues. However, NVTA has never applied for federal grants using regional revenues as matching funds. Is this an opportunity worth exploring? How would projects be identified for federal grant applications?

- In reply to Mr. Boice's query on the legality of the NVTA applying for federal funds, Ms. Backmon responded that it is legally allowed.

- Mr. Ciccarelli and Ms. Ichter raised concerns regarding the NVTA applying for federal money for projects for one jurisdiction over other and allocating funds in anticipation of receiving federal money before securing it.
- The Committee recommended not to pursue this avenue.

TOPIC 6: Debt Capacity
NVTA's Finance Committee will make a recommendation on a not to exceed amount for the SYP and if/when the Authority should use debt capacity. What planning and programming considerations should be factored into the recommendation for use of debt capacity?

- Ms. Ichter opined that debt can queue projects quickly, as well as fund projects that are ready to begin but lack funds.
- The Committee agreed that debt can be used to move projects quickly, but when to use debt capacity must be decided, if such situation arises, by the Finance Committee.

TOPIC 7: Synchronizing with Smart Scale
The next Smart Scale cycle will likely commence in fall 2018. Should the SYP update cycle be synchronized with Smart Scale? What is the optimal update cycle for the SYP? What is the best time of the year for the SYP to be implemented and updated?

- Mr. Fahl suggested waiting until both Smart Scale and TransAction schedules are clearer.
- Ms. Ichter suggested that having NVTA funding decisions lag behind Smart Scale decisions might be advantageous since that will give a clear idea of what projects in the region are funded already.

Adjournment

V. Adjourn Mr. Boice

- Meeting adjourned at 8:35pm.

Six-Year Program (SYP) Framework

Presentation to the TAC

April 19, 2017

Northern Virginia Transportation Authority

The Authority for Transportation in Northern Virginia

What is the SYP Framework?

- Describes how TransAction (TA) and the FY2018-23 Six Year Program will be integrated;
- Describes how the FY2018-23 Six Year Program will be developed;
- Identifies roles, responsibilities, schedule, and other 'structural' aspects of the FY2018-23 Six Year Program;
- Incorporates Financial Principles;
- Will not include list of projects or funding allocations.

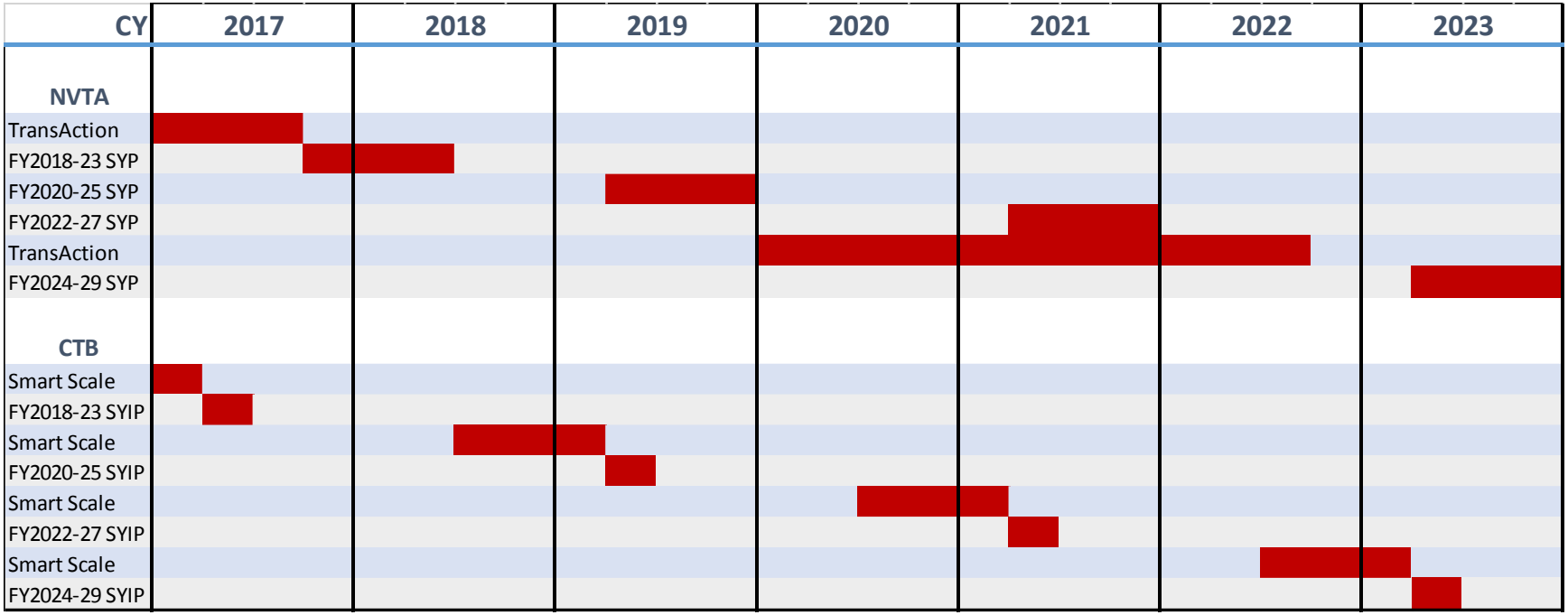
Desired SYP Features

- Transparent and Accountable
  - No secrets or surprises;
  - Leverages cost and time efficiencies wherever possible.
- Flexible
  - Adapts to changing circumstances, e.g. financial, transportation;
  - Maximizes Regional Revenue Fund project use through proactive cash flow and investment management.
- Predictable
  - Provides multi-year funding stream;
  - Matches expected project expenditure profile or funding verification requirements.

Proposed SYP Features – 1

- Assuming the FY2018-23 Six Year Program is adopted in Spring 2018, subsequent updates will be adopted by:
  - Fall 2019 (FY2020-25)
  - Fall 2021 (FY2022-27)
- Updates to the SYP will accommodate:
  - Project/project phase completions;
  - Project schedule and budget adjustments (subject to NVTA policies);
  - Fluctuations in regional revenues;
  - Updated NVTA regional priorities.
- TransAction will be next updated and adopted by Fall 2022;
- Ad-hoc TransAction updates or amendments may occur under exceptional circumstances, subject to NVTA approval and the identification of an acceptable funding source.

Integrated NVTA/CTB Schedule



Proposed SYP Features – 2

- Much like jurisdictional Capital Improvement Plans (CIPs) NVTA's SYP will set an expectation for future funding of the identified projects;
- Subject to Finance Committee recommendation, the SYP will:
  - Allocate estimated revenues (PayGo) for each year of the Program
  - Utilize the Authority's available debt capacity when fiscally prudent.

Proposed SYP Features – 3

- For the FY2018-23 Six Year Program, and subsequent updates, the following process will be followed:
  - Finance Committee will affirm estimated available PayGo revenues for each year of the Six Year Program, through annual budget cycle;
  - NVTA staff brief jurisdiction and agency staff in detail on the SYP process;
  - 'Call for Regional Projects' (CfRP) will be issued by the Authority (mid 10/17), with a 60-day response period (thru mid 12/17);
  - Additional 30-day response period (thru mid 1/18) for Governing Body resolutions
  - Review of responses and evaluation of projects by NVTA staff during a 90-day period following the CfRP response deadline (mid 12/17 – mid 3/18);
  - Review of NVTA staff recommendations during the following 60-day period (mid 3/18 – early 5/18);
  - Public Hearing (5/18) and optional 'Town Hall' meetings during a 30-day public comment period (during 5/18);
  - Adoption of the SYP, generally at the first Authority meeting following the Public Hearing (6/18).

Proposed SYP Features – 4

- Responses to the CfRP will identify a candidate pool of regional projects focused on Northern Virginia's transportation needs;
- The requirements of the CfRP will include, as a minimum:
  - Project description, including specific link to relevant TransAction evaluation;
  - For all project phases: cost, schedule, funding requested, external funding available (with supporting documentation);
  - Commitment to engage/recognize NVTA as a partner in all public-facing outputs, e.g. advanced coordination for public events, branding;
  - Any other documentation that highlights a project's regional significance, e.g. extent to which project addresses regional needs, scale of regional impacts, and multi-jurisdictional commitments;
  - Resolution of support from the Governing Body, or Governing Bodies in the case of multi-jurisdictional projects.

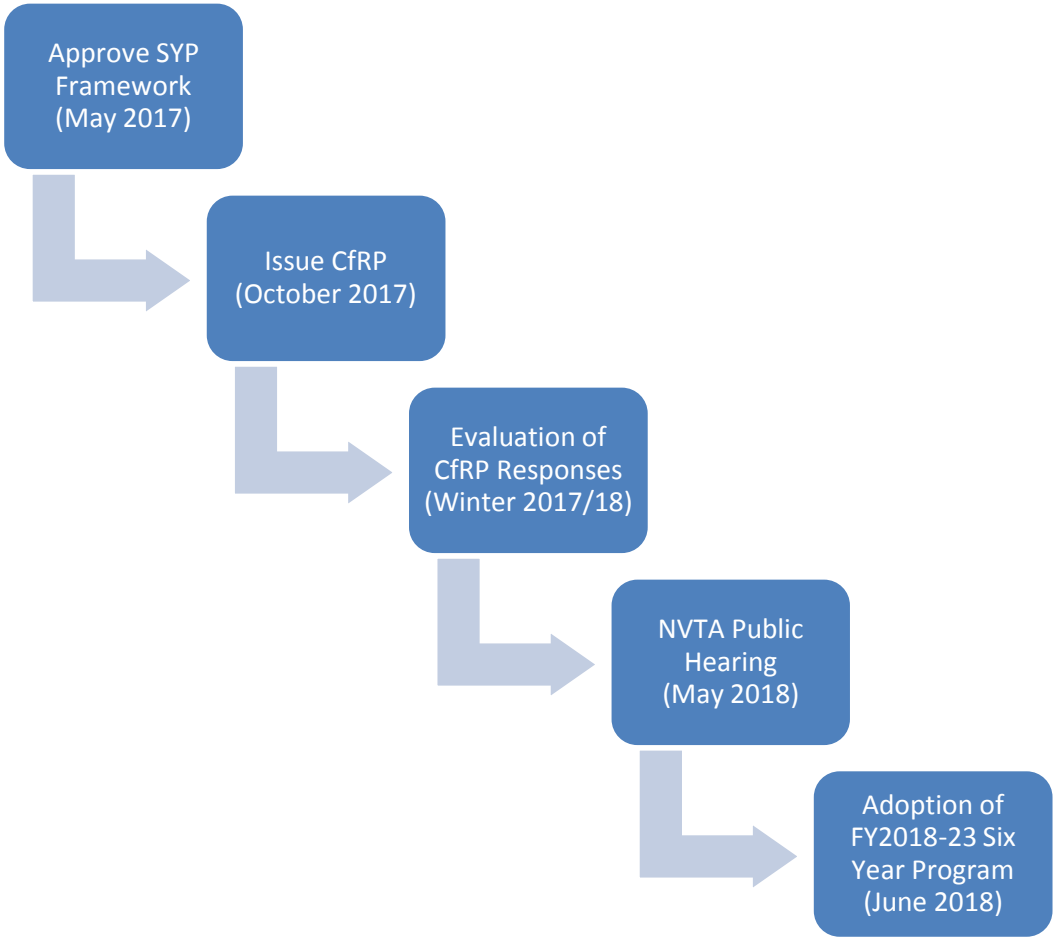
Proposed SYP Features – 5

- The review of CfRP responses and evaluation of projects by NVTA staff will include, as a minimum:
  - Verification of accuracy and completeness of responses;
  - Validation of project eligibility and consistency with relevant NVTA policies;
  - Posting of a summary of responses to NVTA's website;
  - Review of relevant TransAction evaluations, including 'regional coherence', phasing, and sequencing of CfRP projects;
  - Calculation of CRRC ratios;
  - Consideration of the TransAction scenario analysis
  - Documentation of relevant qualitative considerations;
  - Development of initial recommendation, for review by NVTA's Committees;
  - Development of draft recommendation, based on feedback from NVTA's Committees, for Authority action.

Other SYP Considerations

- Finance Committee to recommend Financial Principles addressing:
  - Proportion of estimated available PayGo funding that should be allocated in each Fiscal Year of the SYP;
  - Factors that influence the extent to which available debt capacity should be used, and when;
  - Provision for NVTA to provide matching funds for federal grant programs.
- Finance Committee will consider new/enhanced policies related to NVTA's programming process.

Key Milestones – Six Year Program



NVTA's TransAction

Transportation Action Plan for Northern Virginia

TransAction Preview: 2040 Baseline Conditions

Technical Advisory Committee

April 19, 2017

NVTA's TransAction

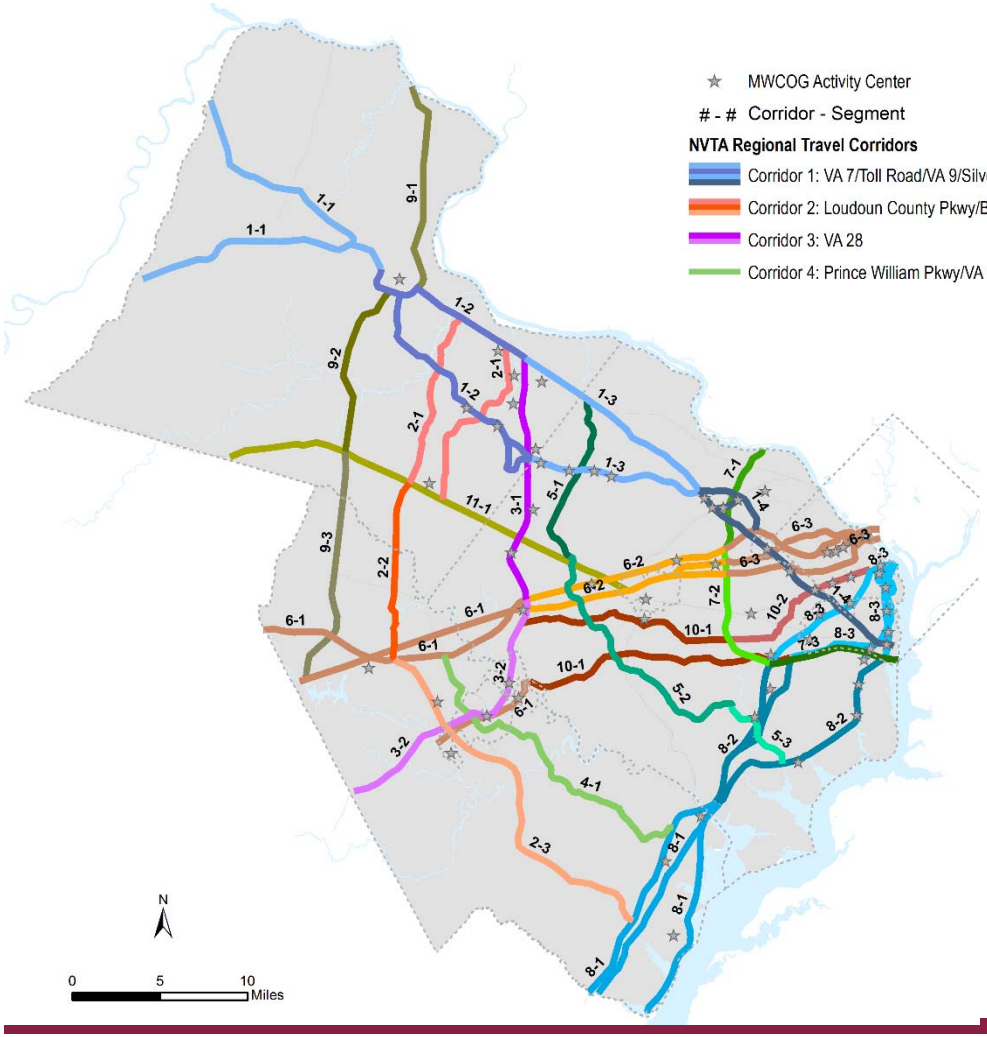
Agenda

- Process
- Baseline Conditions
- Candidate Regional Projects
- Summary of Model Results
- Scenario Analysis
- Next Steps
- Supplementary Information

Process – 1

- Two parallel tracks
  - Public Engagement (Spring and Fall 2016)
  - Technical Analysis
- Establish TransAction 2040 Baseline
  - MWCOG Round 9.0 forecasts; 2040 planning horizon
  - Transportation network comprising existing multi-modal network and all fully funded, committed projects
  - Development of four ‘alternate futures’ for scenario (sensitivity) analysis

Process – 2



Focus on improving travel conditions on 11 multi-modal corridors, divided into 28 corridor segments

NVTA's TransAction

Process – 3

- Performance Measures
  - Performance of the plan evaluated at multiple levels (regional, corridor, corridor segment)
  - Evaluation uses 15 measures, including all seven HB 599 (2012) measures; each measure weighted 5 or 10 percent
  - Integrates HB 599 process into TransAction
- Benefit/Cost Analysis
  - TransAction includes a separate ‘planning level’ BCA, using project cost estimates

Process – 4

- Unconstrained Approach
  - TransAction embraces regional transportation solutions to regional transportation needs
  - Unlike MWCOG/TPB's CLRP, TransAction is a fiscally unconstrained plan
  - TransAction includes candidate regional projects with a full or partial funding need, regardless of whether such projects are eligible for NVTA's regional revenues

Process – 5

- Analytical Approach
  - Single ‘Plan’ option for 2040; with and without two new Potomac River Crossings (highways)
  - ‘Plan’ option includes a combination of ‘bottom-up’ and ‘top-down’ (e.g. ICM/ITS, TDM, high performance transit) candidate regional projects
  - ‘Plan’ option compared to 2040 TransAction Baseline
  - ‘Plan’ option additionally evaluated against 2040 baseline conditions associated with each of the four scenarios

Process – 6

- Caveats
  - TransAction is a multi-modal long range regional transportation plan; it does not seek to evaluate or optimize individual projects
  - Analytical approach addresses recurring congestion; model simulations do not adequately address non-recurrent congestion

Baseline Conditions

- MWCOG Round 9.0 forecasts
- 2040 planning horizon
- 2016 existing multi-modal transportation network plus:
  - Projects currently under construction
  - Future, committed projects with full funding
- Baseline includes: Metrorail Silver Line Phase II, Transform 66, I-395 Express Lanes, I-95 Express Lanes extension

2016 vs. 2040 TransAction Baseline

	2016	2040 TransAction Baseline	% Change
Population			
Northern VA	2,413,009	2,994,401	24%
DC Metro	7,150,948	8,788,431	23%
Employment			
Northern VA	1,362,880	1,873,262	37%
DC Metro	4,066,099	5,253,305	29%

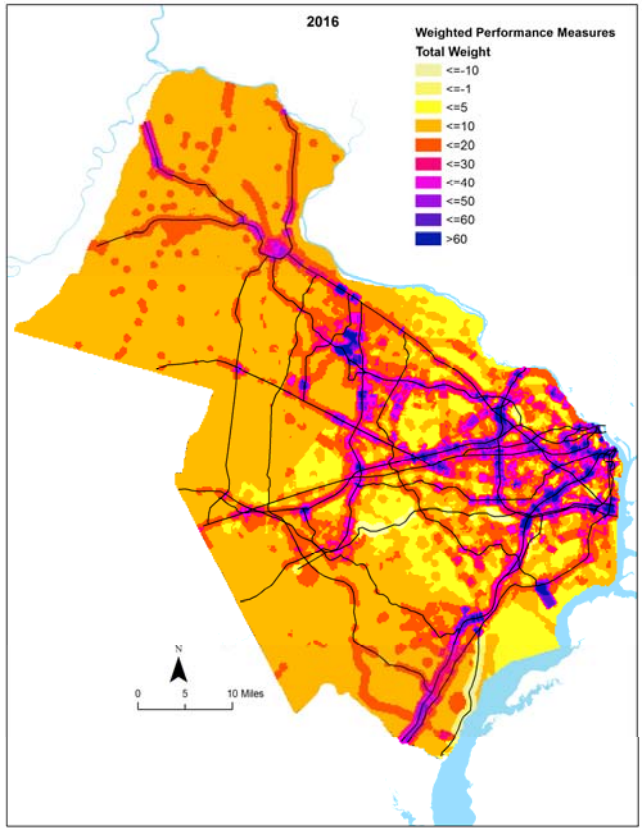
NVTA's TransAction

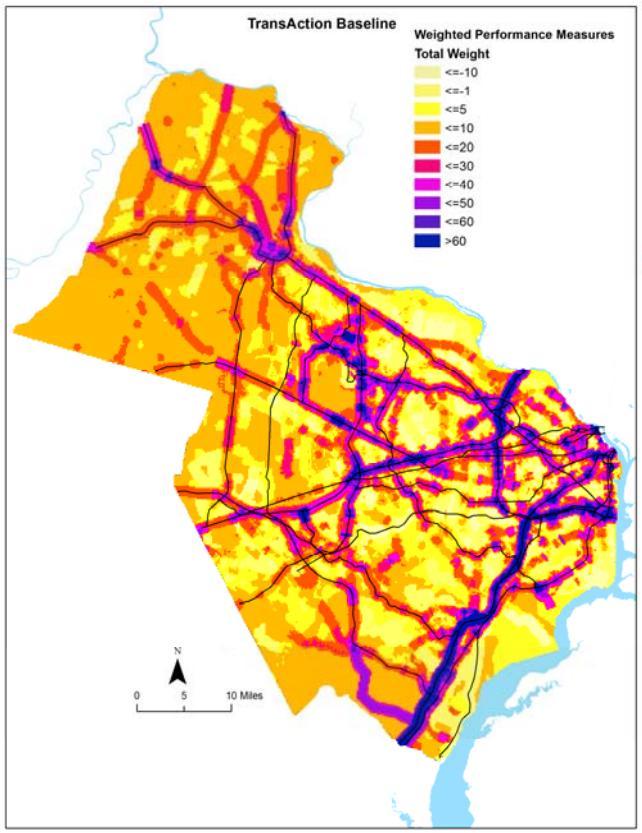
2016 vs. 2040 TransAction Baseline

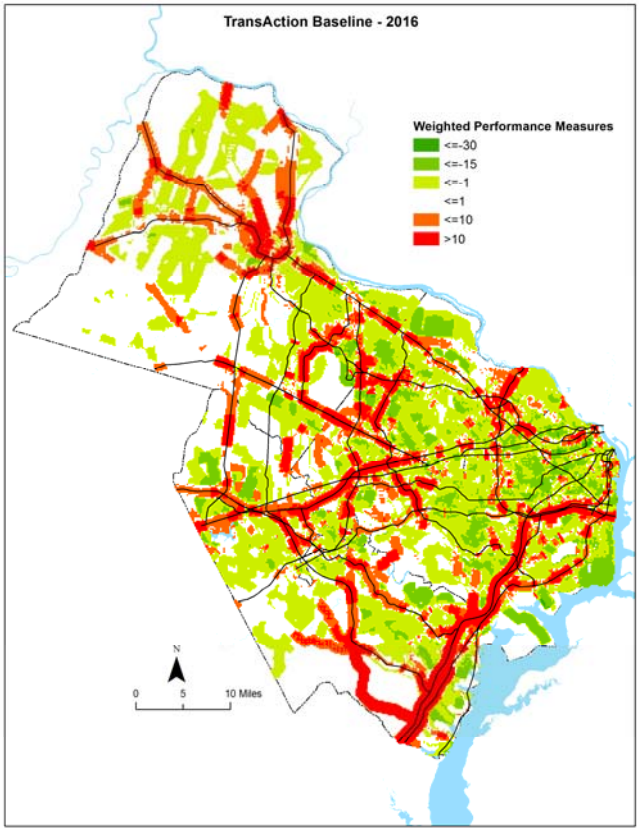
Daily Measures	2016	2040 TransAction Baseline	% Change
Motorized Trips	8,737,000	10,462,000	19.7%
Auto Trips	7,862,000	9,432,000	20.0%
Transit Trips	876,000	1,030,000	17.6%
Transit Share	10.0%	9.8%	-0.2%
Transit Boardings	1,002,000	1,359,000	35.6%
Miles of Travel	104,838k	125,378k	19.6%
Hours of Travel	3,298,000	5,811,000	76.2%
Hours of Delay	1,007,000	3,030,000	201%
Transit Crowding	10,800	20,100	86.8%

2040 TransAction Baseline

2040 TransAction Baseline compared to 2016 Conditions

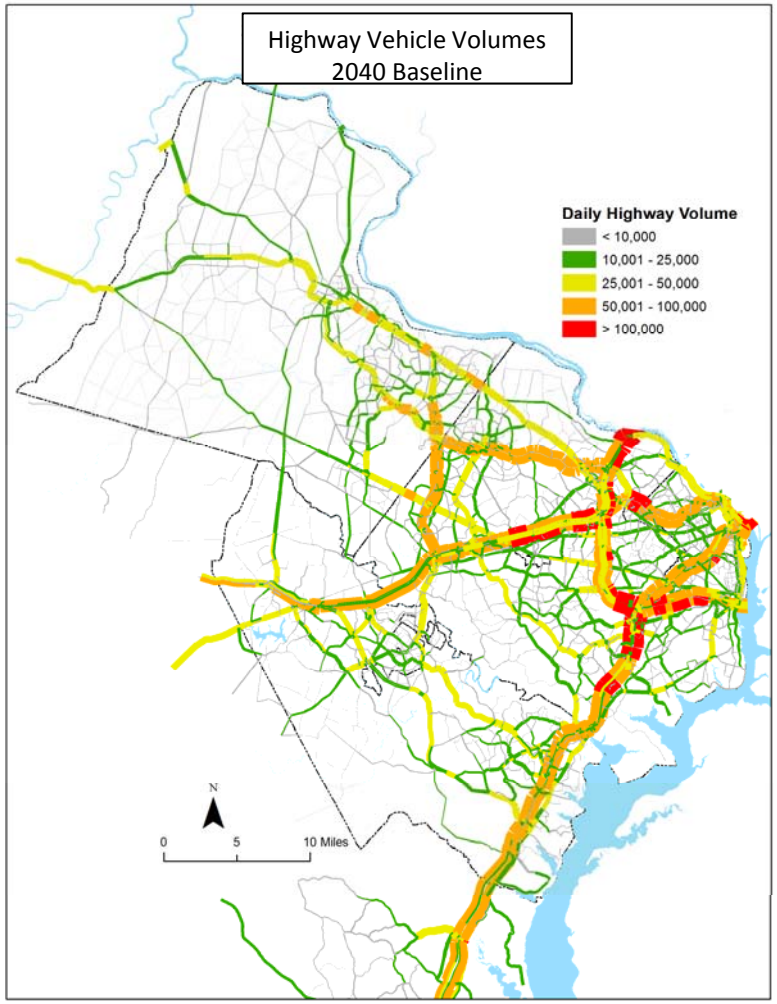






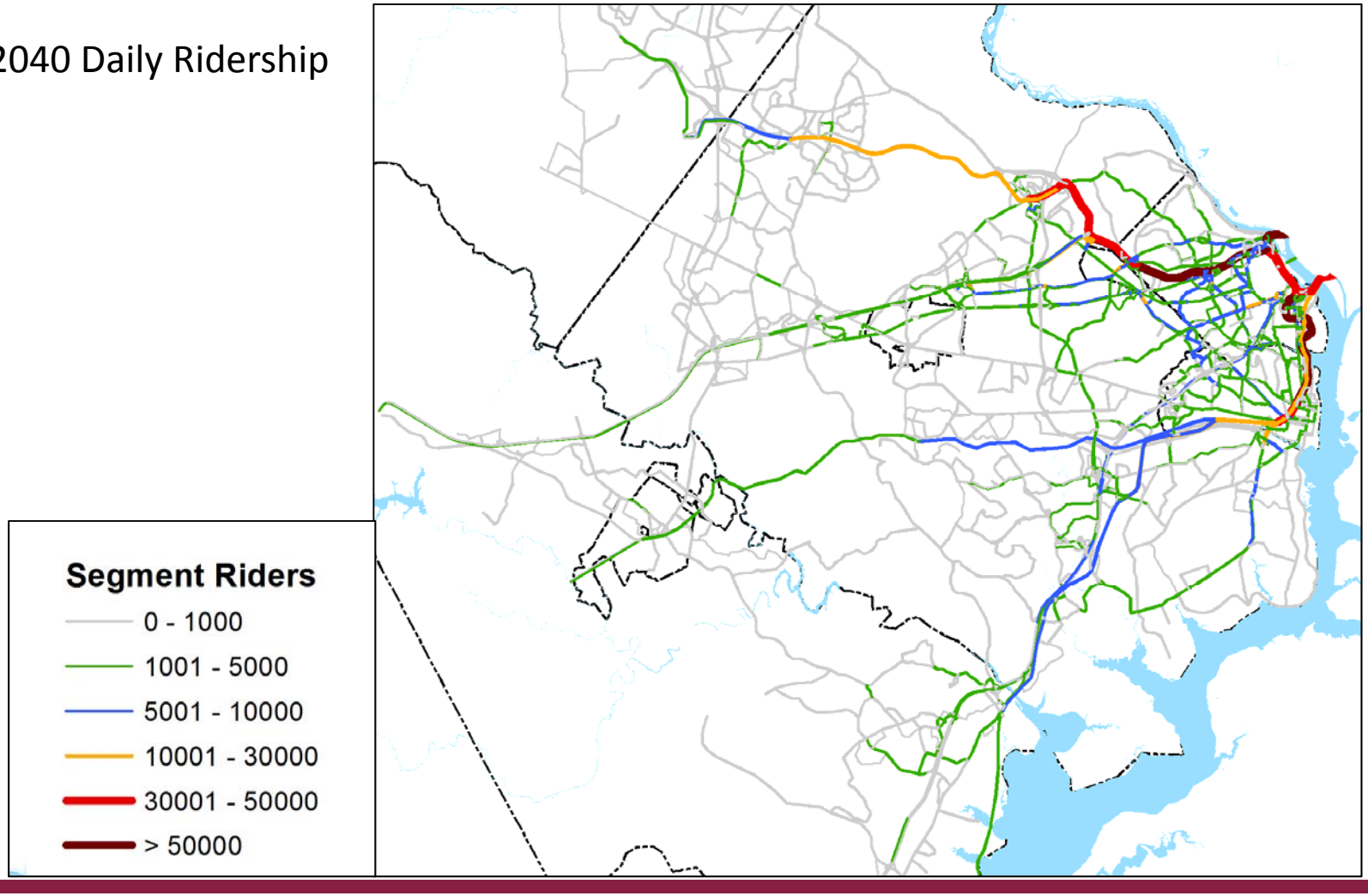
NVTA's TransAction

Vehicle Volumes



Transit Ridership

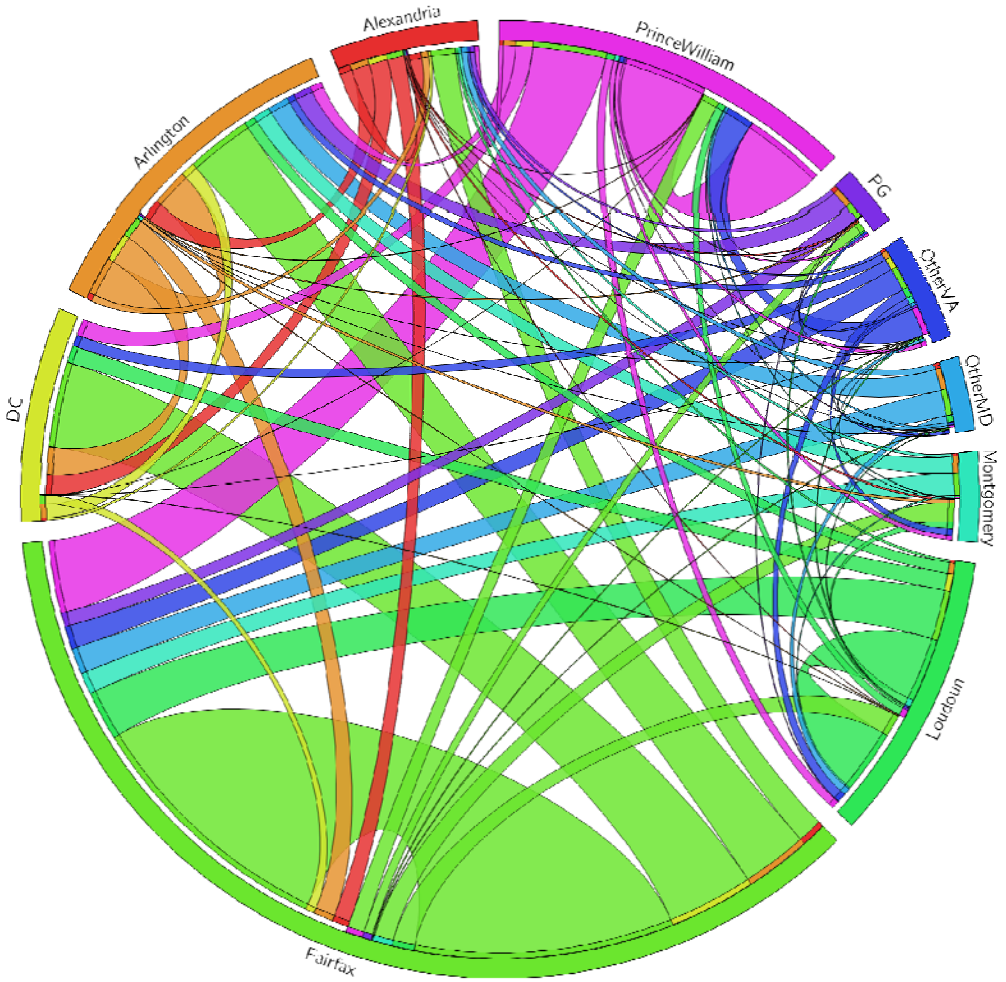
2040 Daily Ridership



NVTA's TransAction

Origins and Destinations

2040 Commute Patterns

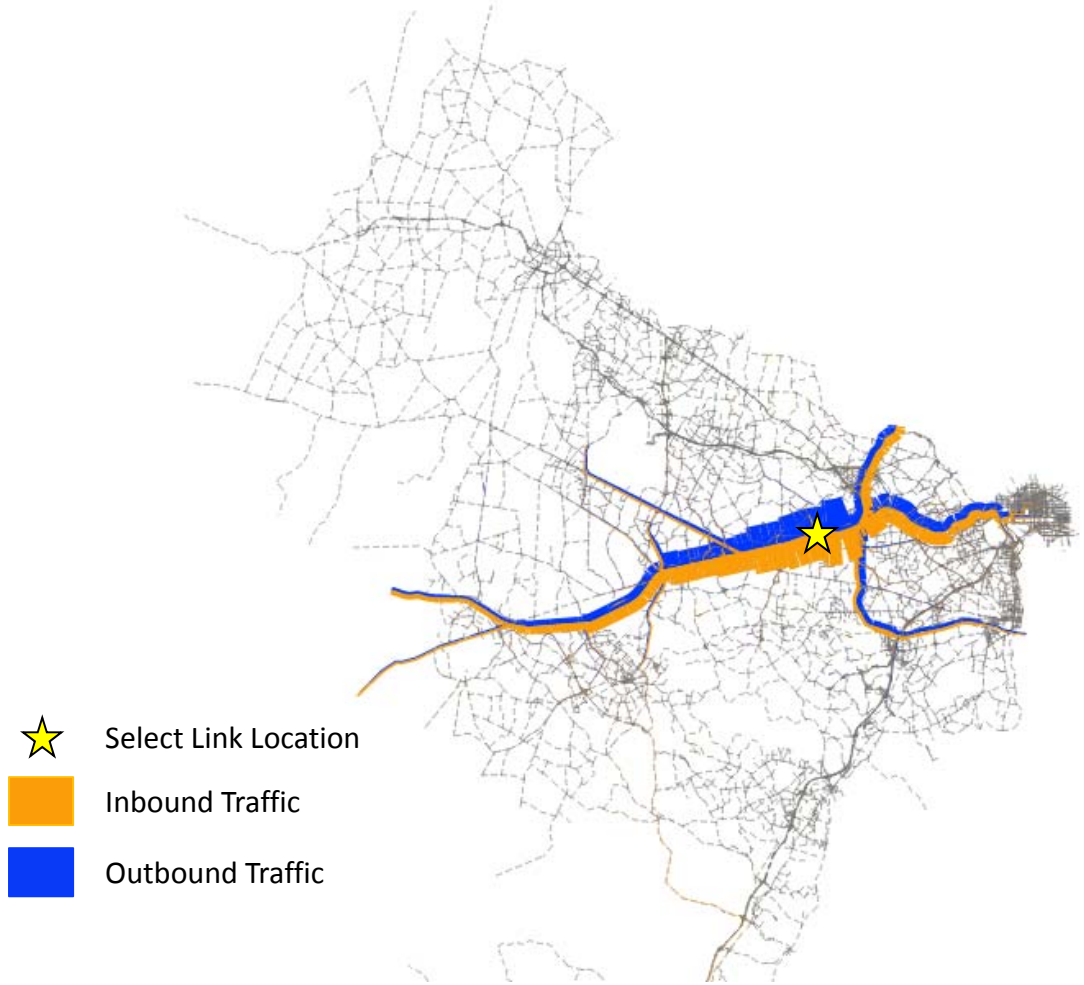


Source: MWCOG 2040 Travel Forecasts, Round 9.0 Land Use

NVTA's TransAction

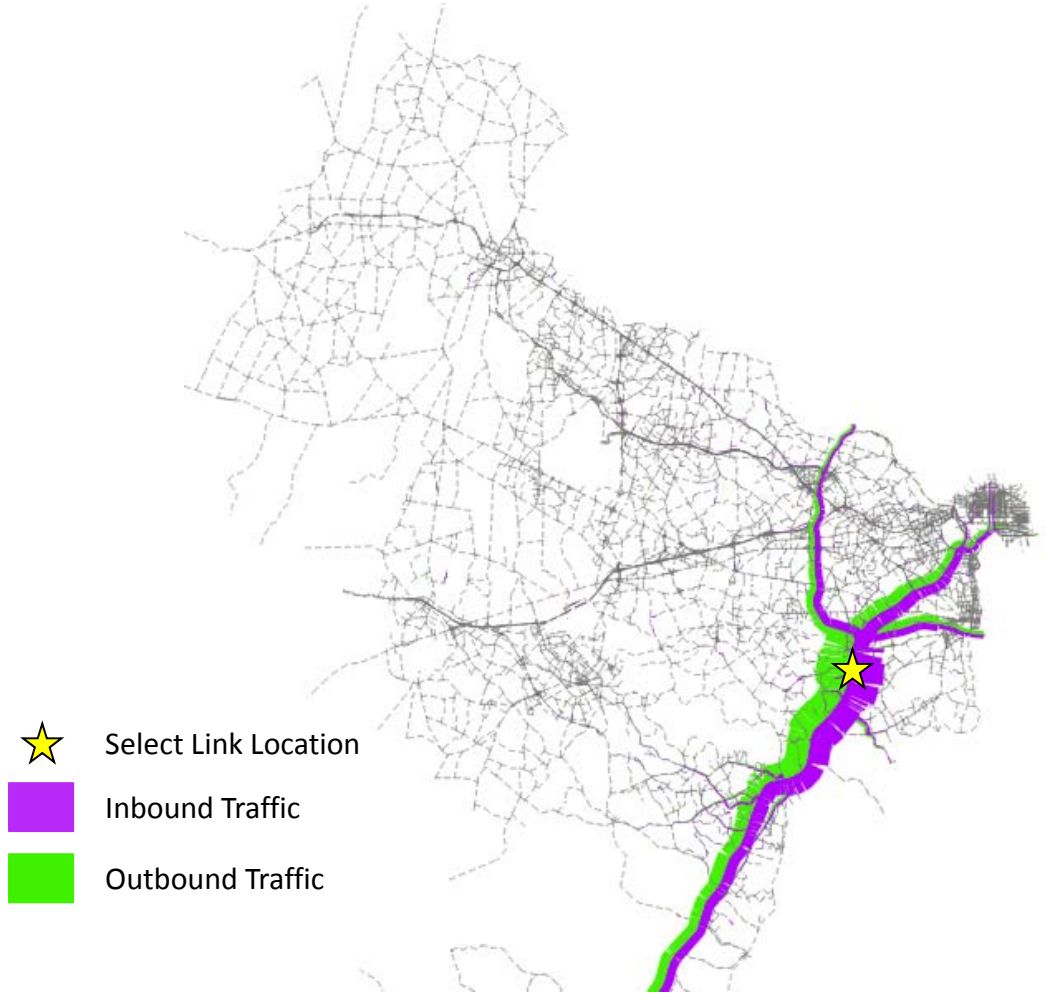
Select Link Analysis - 2040 Baseline

I-66 @ Vienna



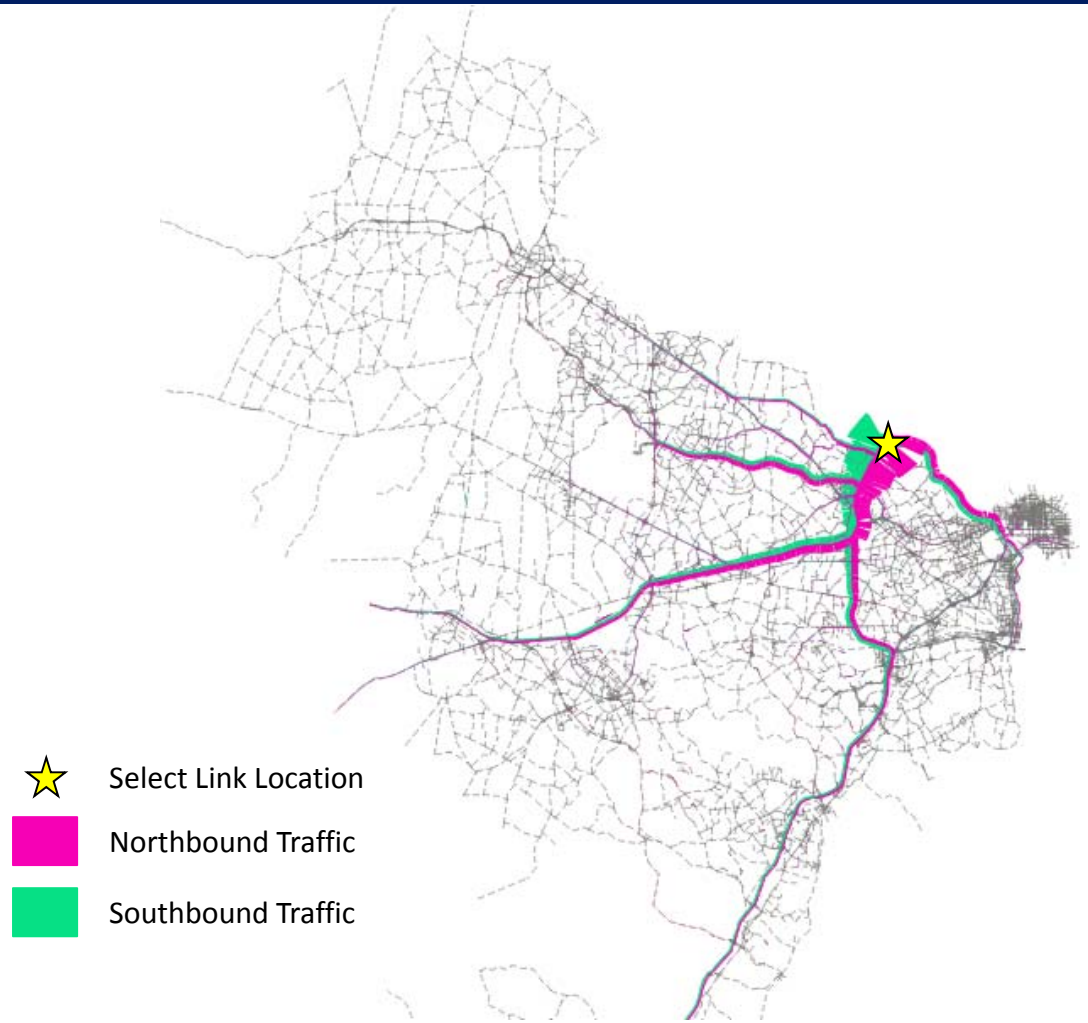
Select Link Analysis – 2040 Baseline

I-95 @ Springfield



Select Link Analysis – 2040 Baseline

I-495 American Legion Bridge



NVTA's TransAction

Select Link Analysis – 2040 Baseline

I-495 Wilson Bridge

Draft Plan Projects

Total Projects in Draft Plan	Plan Cost Estimate w/ ROW ($bn)
358	$41.6

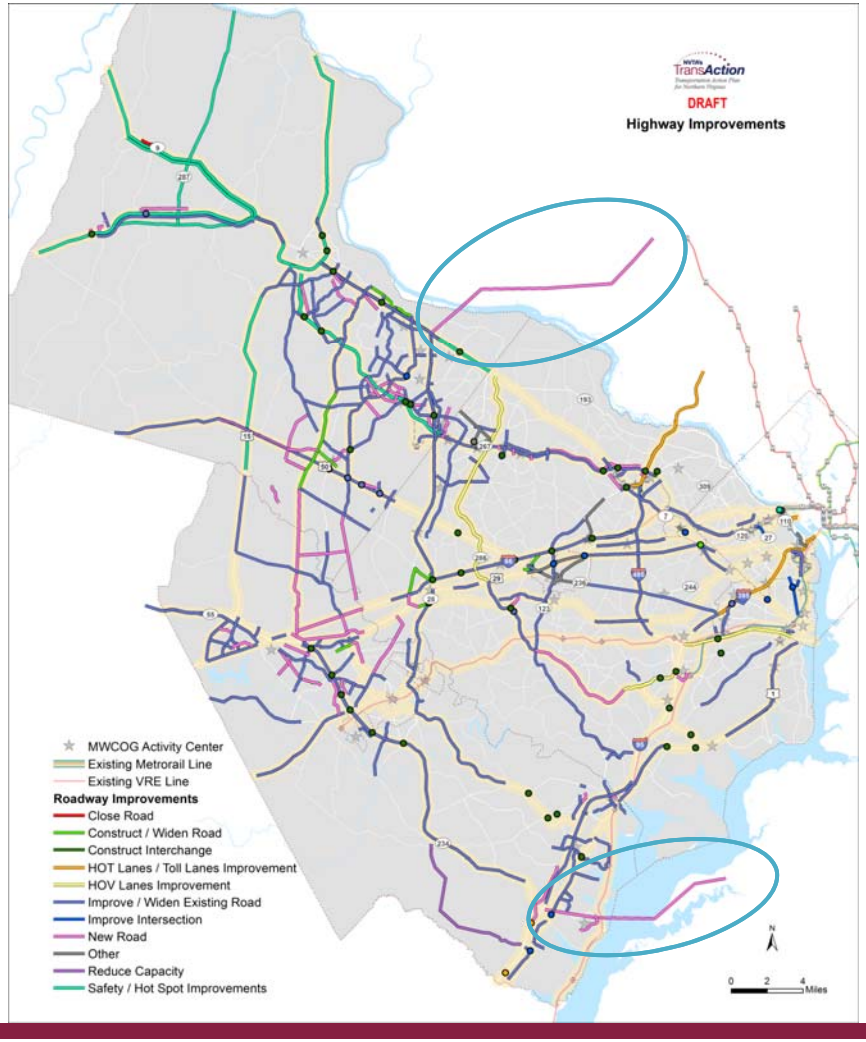
Project Type	Total Projects*
Roadway	238
Transit	104
Non-motorized	45
ITS[1] / ICM[2] / TDM[3]	30

*Projects can be categorized as multiple types

[1] ITS: Intelligent Transportation Systems
[2] ICM: Integrated Corridor Management
[3] TDM: Transportation Demand Management

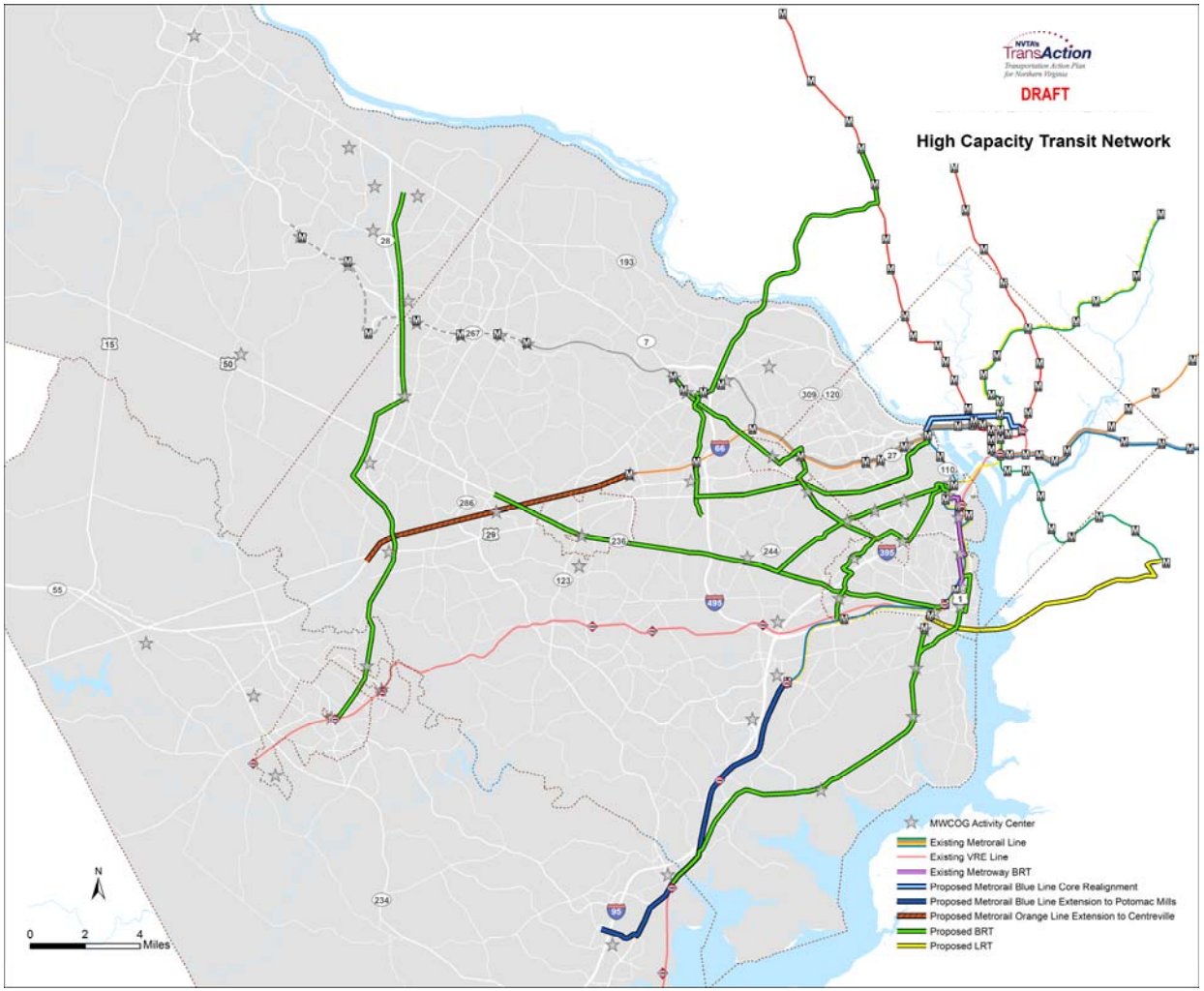
Highway Projects

Draft Plan tested with and without new Potomac River bridges



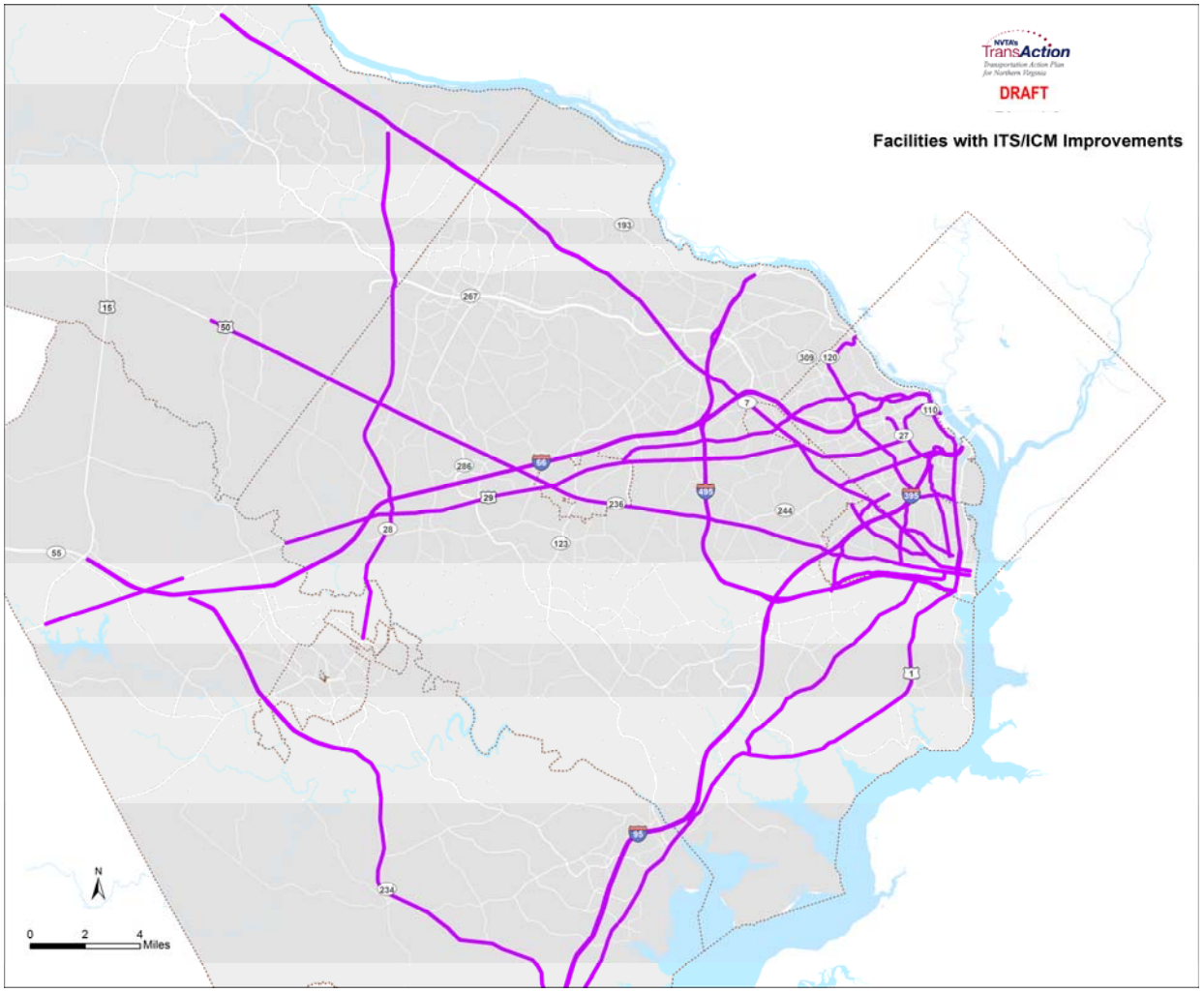
NVTA's TransAction

High Capacity Transit Network



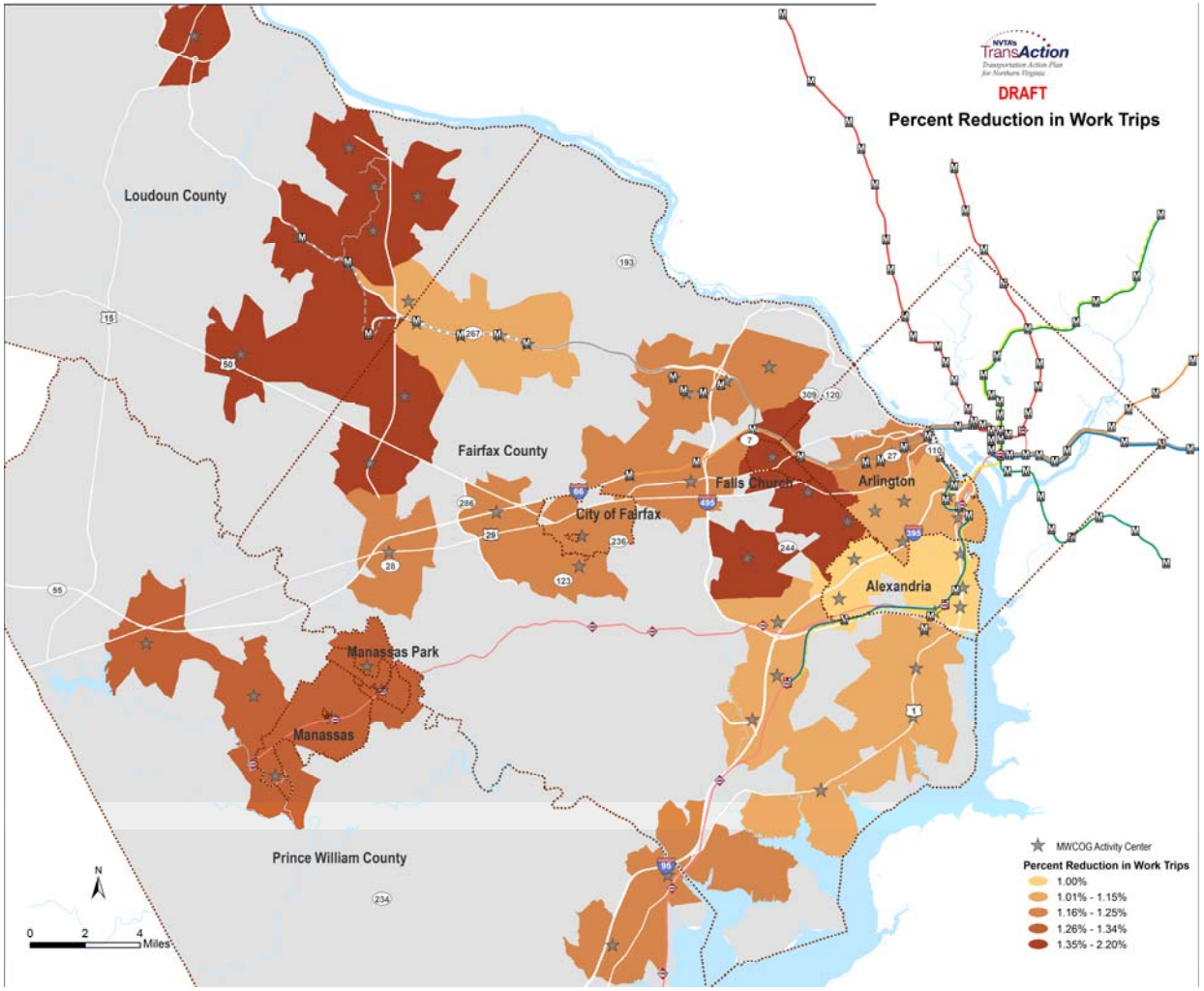
NVTA's TransAction

ITS/ICM Corridors



NVTA's TransAction

TDM Focus Areas



Summary of Model Results

Draft Plan (without bridges)

Daily Measures	2016	2040 TransAction Baseline	Draft Plan	% Change
Motorized Trips	8,737,000	10,462,000	10,561,000	0.9%
Auto Trips	7,862,000	9,432,000	9,438,000	0.1%
Transit Trips	876,000	1,030,000	1,123,000	9.0%
Transit Share	10.0%	9.8%	10.6%	8.2%
Transit Boardings	1,002,000	1,359,000	1,552,000	14.2%
Miles of Travel	104,838k	125,378k	124,863k	-0.4%
Hours of Travel	3,298,000	5,811,000	4,462,000	-23.2%
Hours of Delay	1,007,000	3,030,000	1,717,000	-43.3%
Transit Crowding	10,800	20,100	7,200	-64.2%

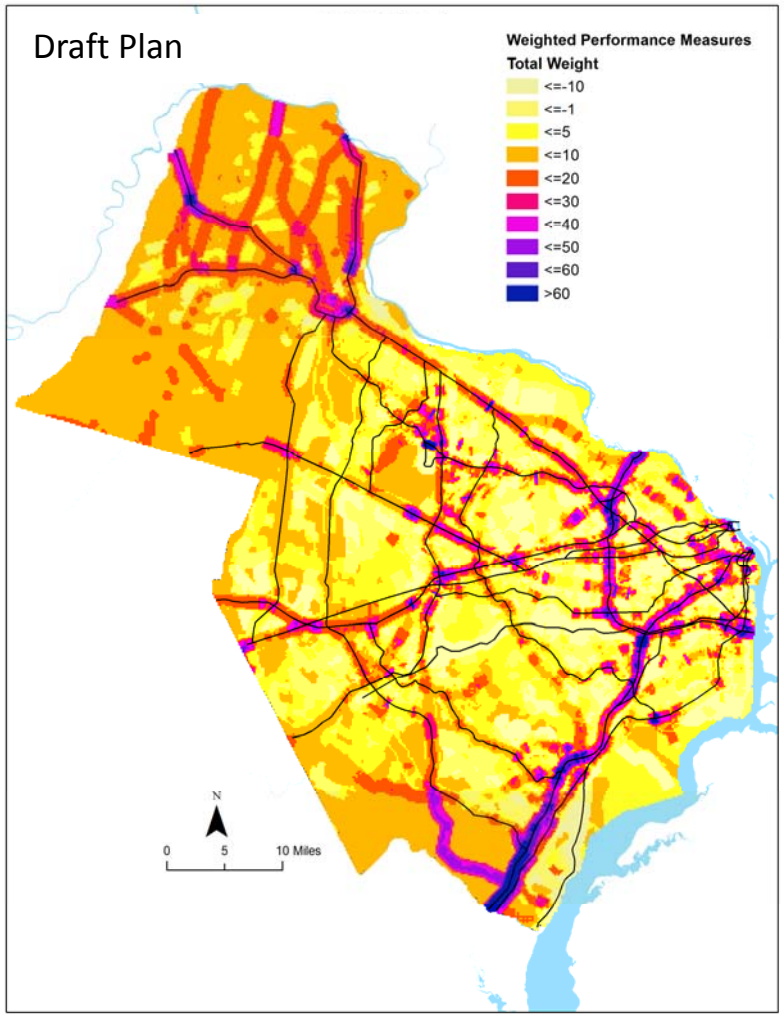
Transit Boardings

Daily Boardings	2016	2040 TransAction Baseline	Draft Plan (without bridges)	% Change
BRT/LRT	4,100	14,600	236,200	1518%
Metrorail	690,600	848,000	916,100	8.0%
VRE	18,700	26,800	30,200	12.7%
Other Routes	288,900	469,300	369,200	-21.3%
Total	1,002,300	1,358,700	1,551,700	14.2%

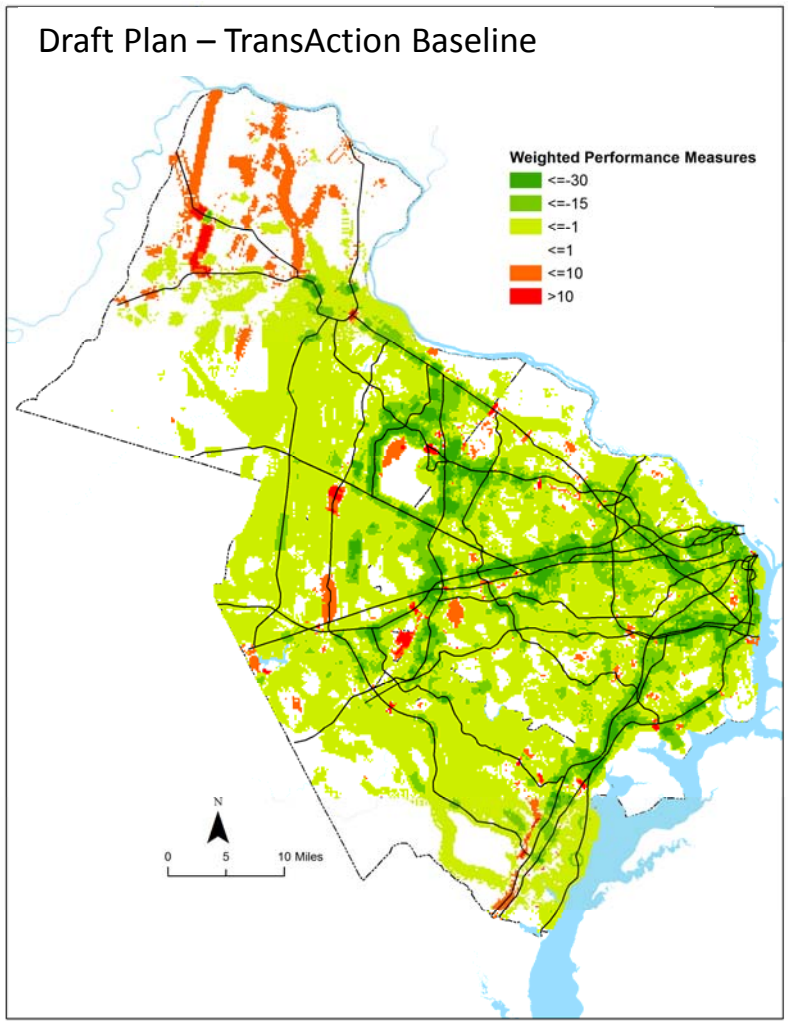
Performance Impact

Draft Plan (without new bridges) compared to 2040 TransAction Baseline

Draft Plan



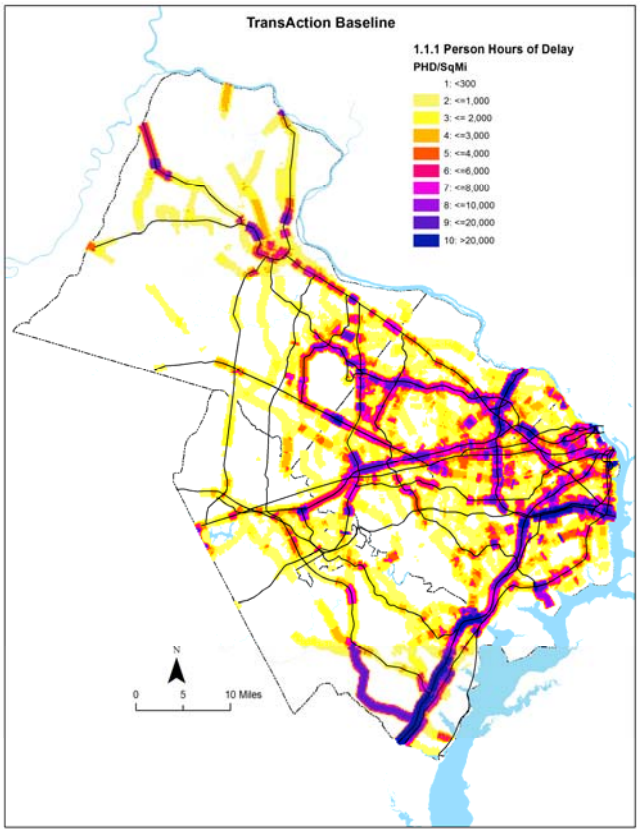
Draft Plan – TransAction Baseline

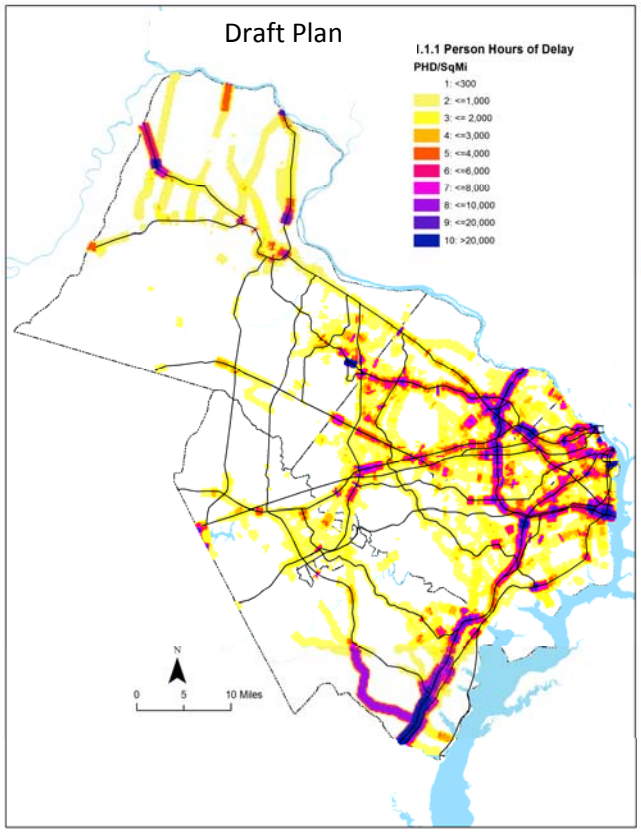


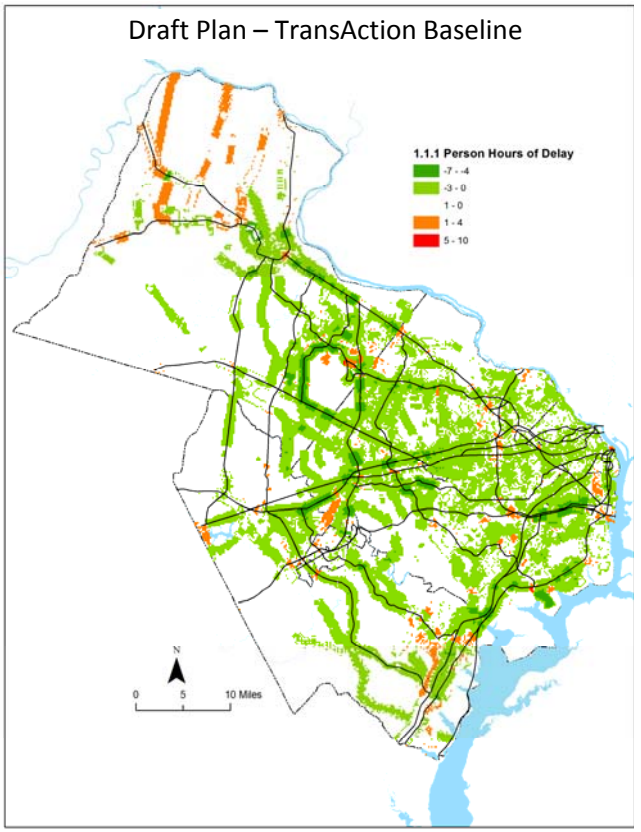
NVTA's TransAction

Person Delay Impacts

Draft Plan(without bridges) compared to 2040 TransAction Baseline



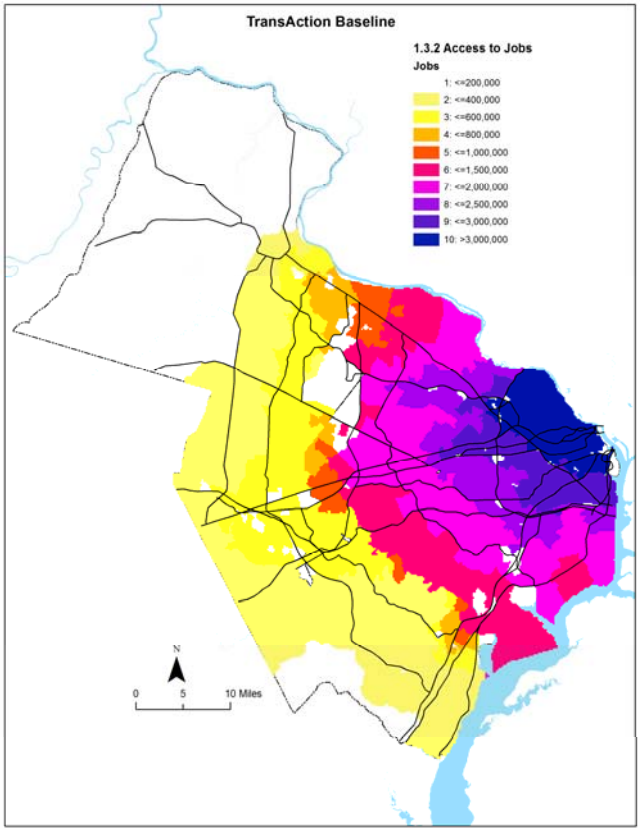


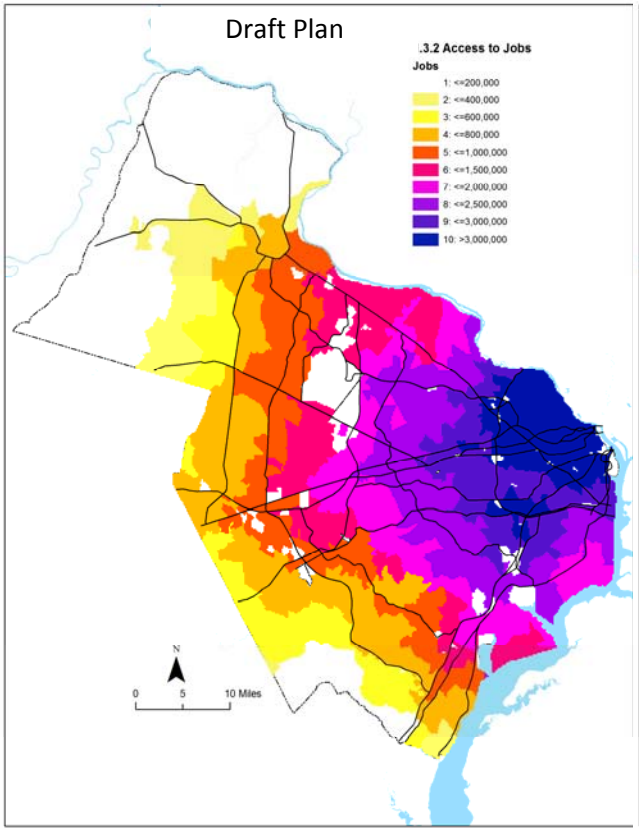


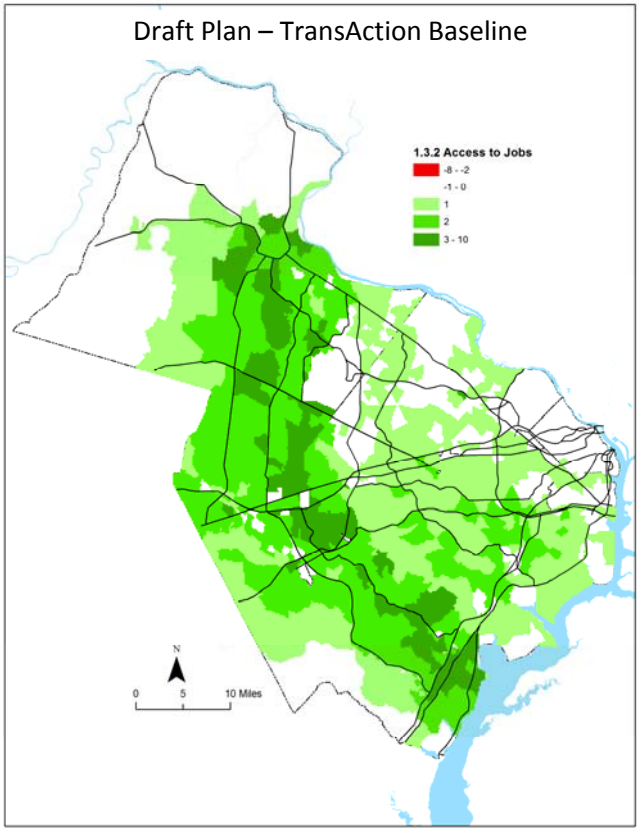
NVTA's TransAction

Access to Jobs Impact

Draft Plan (without bridges) compared to 2040 TransAction Baseline







NVTA's TransAction

Draft Plan (w/o bridges): Initial Findings

- Draft Plan without new bridges (compared to 2040 TransAction baseline):
  - Modestly increased total trips (< 1.0%), but with increased transit share (by 8.2%)
  - Person miles traveled decrease marginally, but person hours of travel and hours of delay noticeably reduced (by 23% and 43%)
  - Transit crowding significantly reduced (by 64%) to below 2016 levels, in part due to regional BRT/LRT additions
  - Noticeable improvement in job accessibility for residents in a broad corridor from Leesburg to S. Prince William Co.
  - Residual problem areas include I-95 and I-495

Alternate Futures

- Four Alternate Futures tested:
  - Scenario A: Technology makes driving easier
  - Scenario B: Changes in travel behavior
  - Scenario C: Dispersed land use growth
  - Scenario D: Concentrated land use growth
- Scenarios are ‘plausible’ alternate futures, but are neither ‘predicted’ nor ‘preferred’; hybrid scenarios are ‘probable’
- Scenario (sensitivity) analysis provides an understanding of the robustness of TransAction findings and recommendations
- NVTA may wish to explore future proactive policy directions associated with any desired alternate futures

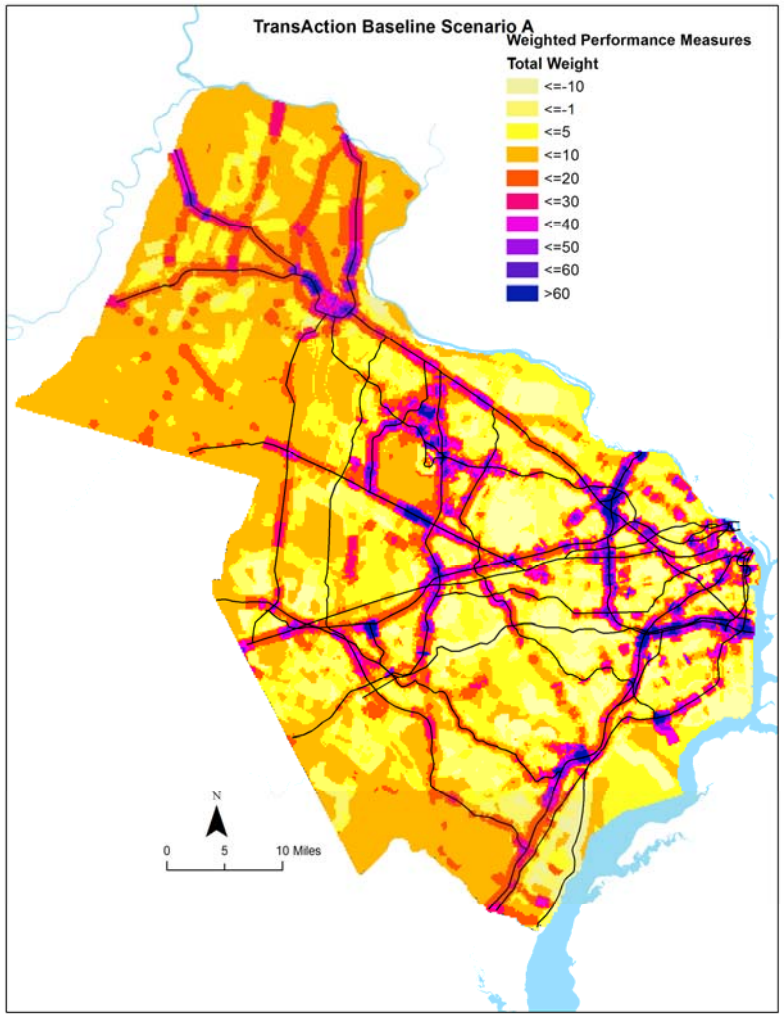
Scenario Baseline Results

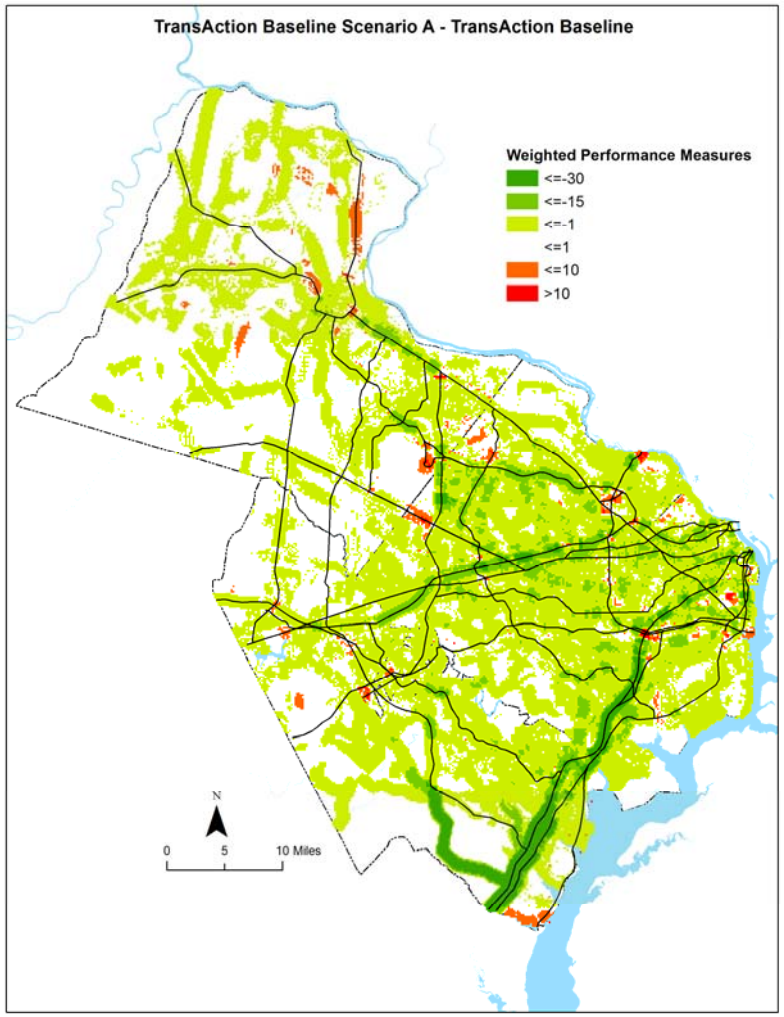
Daily Measures	2016	TransAction Baseline	Scenario A	Scenario B	Scenario C	Scenario D
Motorized Trips	8,737,000	10,462,000	10,847,000	10,063,000	10,733,000	10,320,000
Auto Trips	7,862,000	9,432,000	9,731,000	9,071,000	9,807,000	9,284,000
Transit Trips	876,000	1,030,000	1,116,000	992,000	926,000	1,037,00
Transit Share	10.0%	9.8%	10.3%	9.9%	8.6%	10.0%
Transit Boardings	1,002,000	1,359,000	1,382,000	1,144,000	1,239,000	1,389,000
Miles of Travel	104,838k	125,378k	127,818k	116,615k	129,719k	121,587k
Hours of Travel	3,298,000	5,811,000	4,305,000	4,515,000	5,850,000	5,188,000
Hours of Delay	1,007,000	3,030,000	1,324,000	1,932,000	2,996,000	2,520,000
Transit Crowding	10,800	20,100	13,800	12,900	16,500	19,700

NVTA's TransAction

Scenario A Baseline Results

Scenario A Baseline compared to 2040 TransAction Baseline

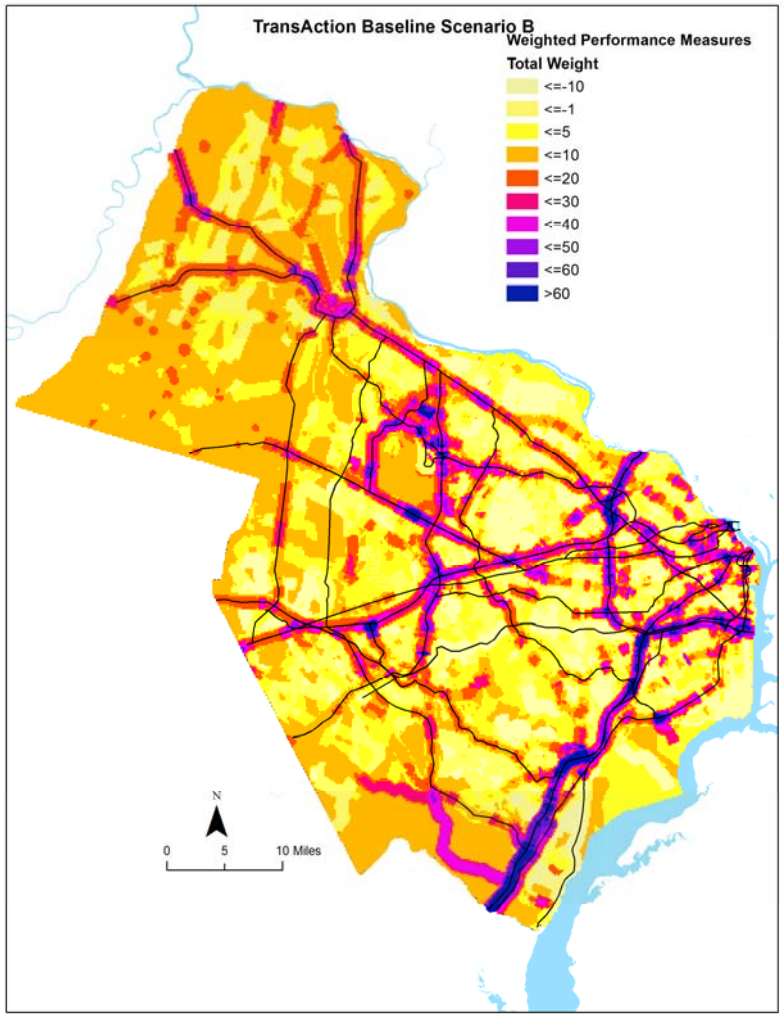


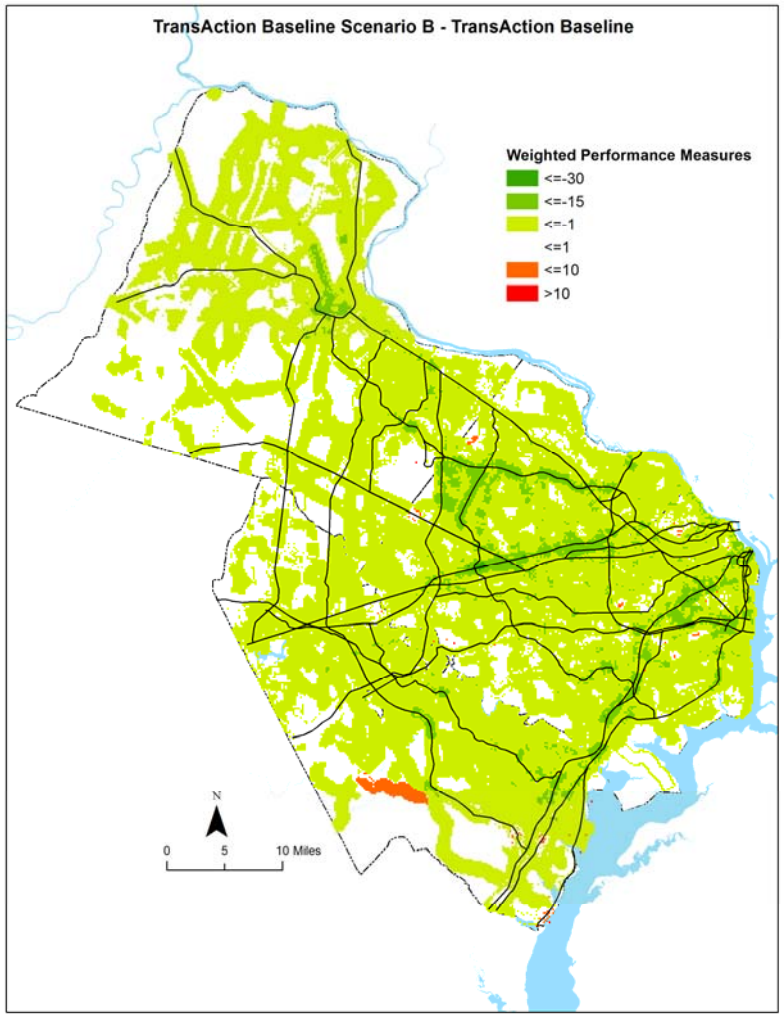


NVTA's TransAction

Scenario B Baseline Results

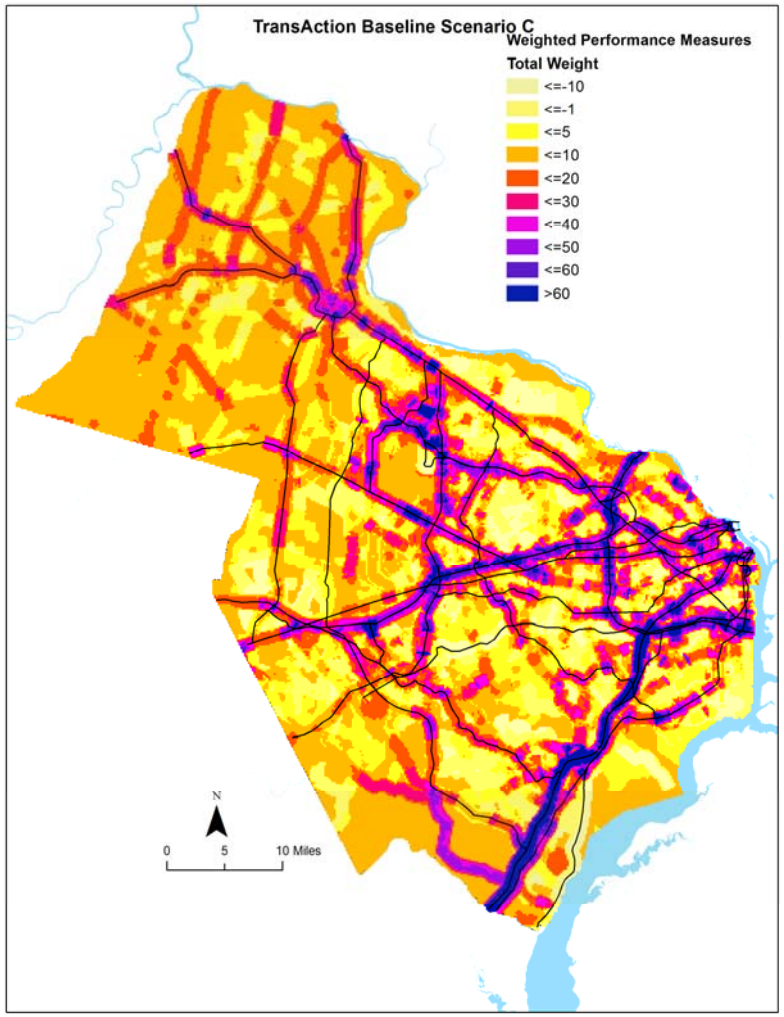
Scenario B Baseline compared to 2040 TransAction Baseline

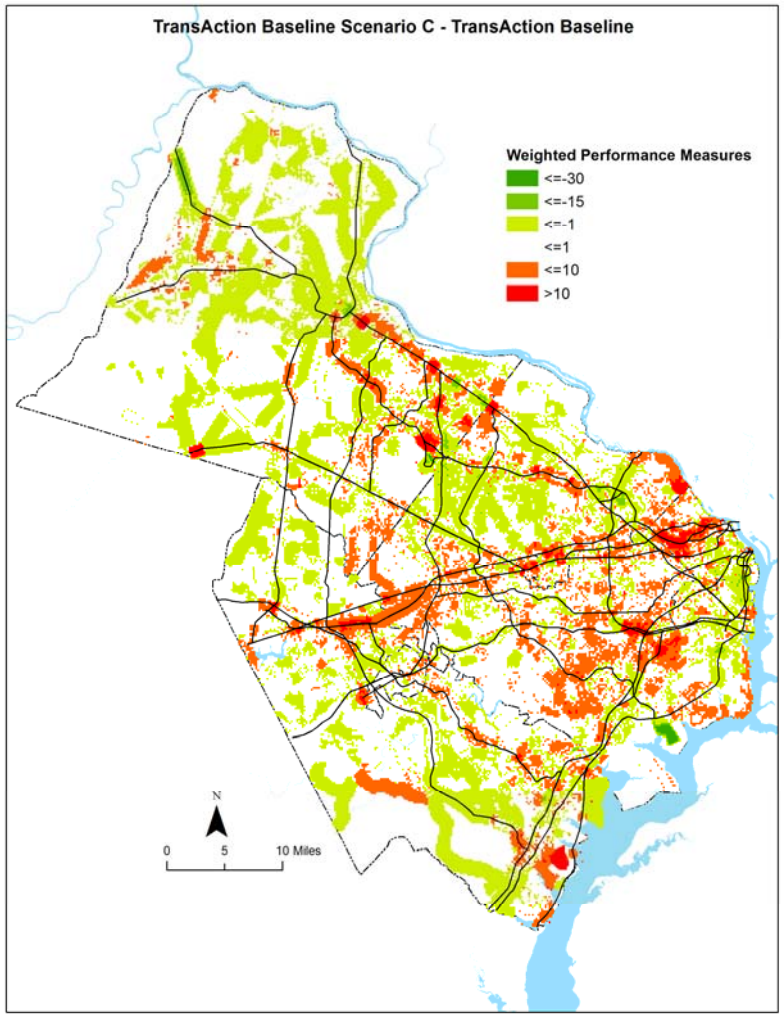




Scenario C Baseline Results

Scenario C Baseline compared to 2040 TransAction Baseline

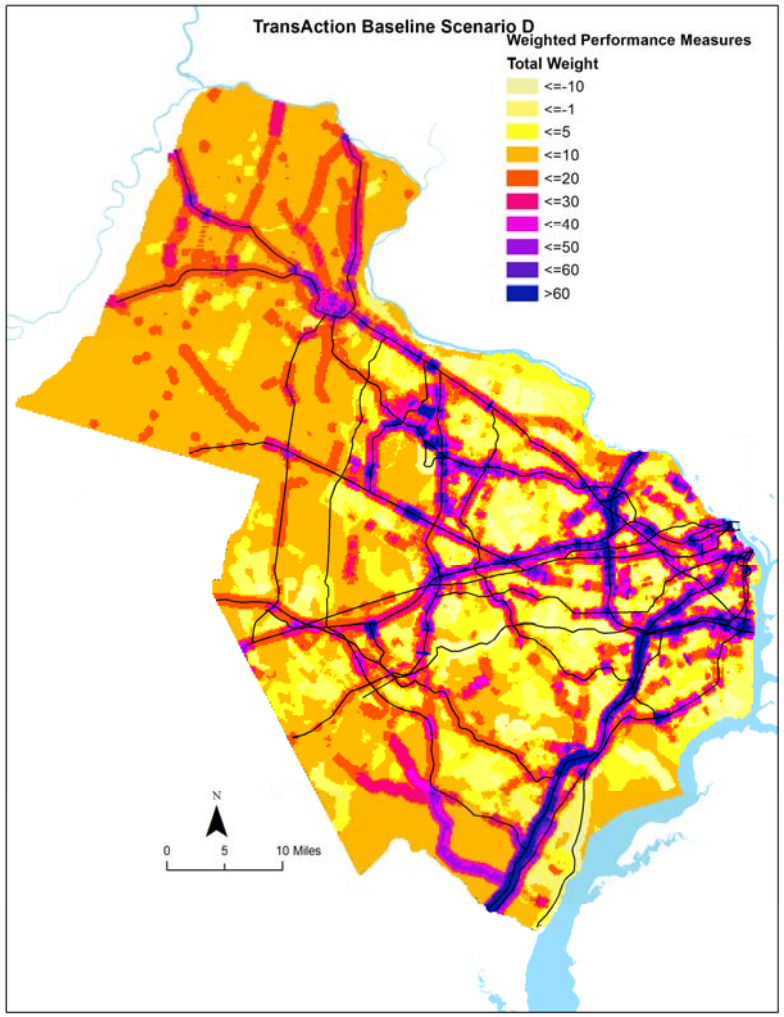


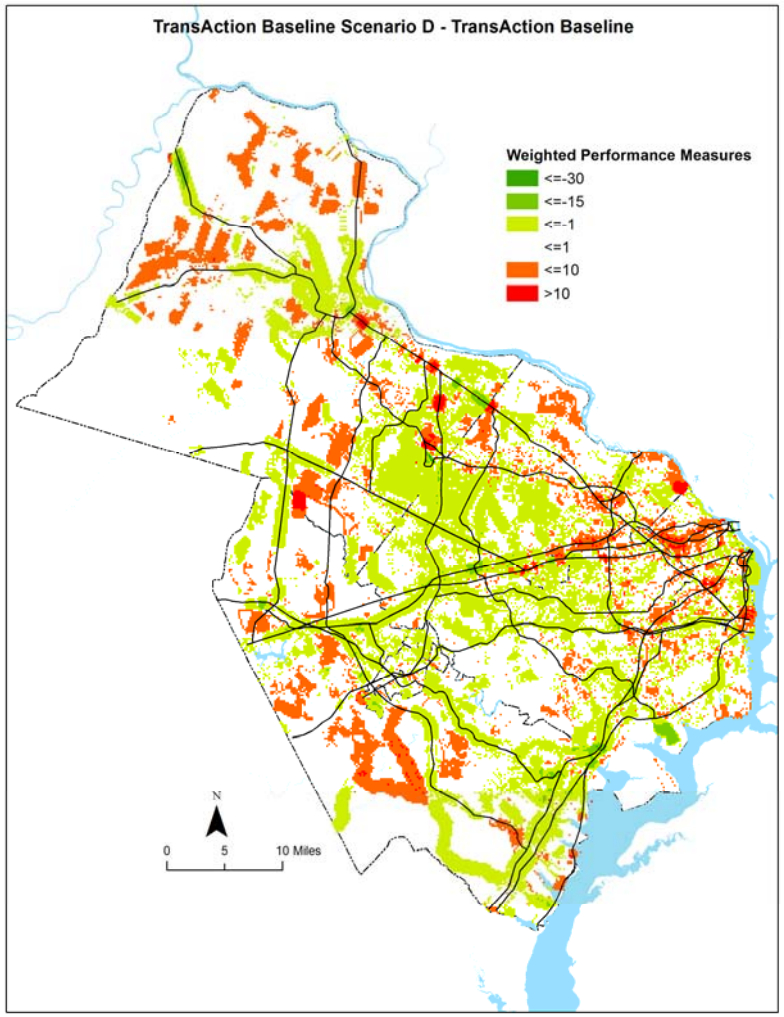


NVTA's TransAction

Scenario D Baseline Results

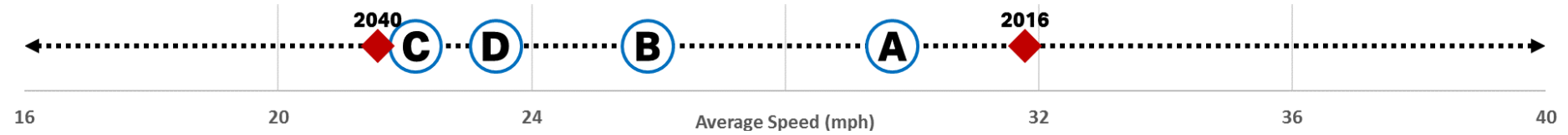
Scenario D Baseline compared to 2040 TransAction Baseline

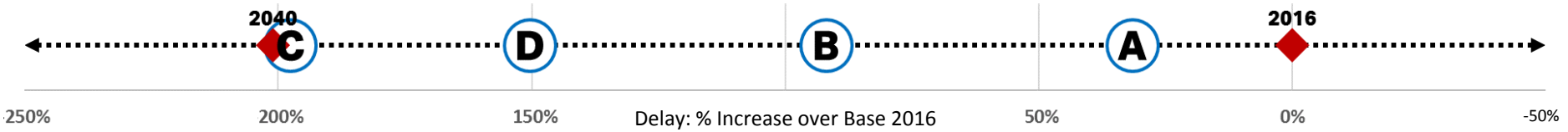


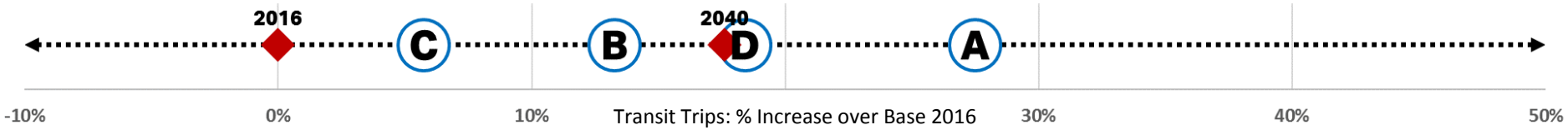


NVTA's TransAction

Future Scenarios







Higher Performing

NVTA's TransAction

Alternate Futures: Key Highlights

- Scenarios A and B provide the greatest improvement in travel conditions over the 2040 TransAction baseline
  - Scenario A has the lowest person hours of delay (less than 55% of Baseline and Scenarios C and D)
  - Scenario B has the lowest level of transit crowding
- Scenarios C and D highlight the relationship between land use and transportation
  - Scenario C appears to be the least desirable alternate future, is still better than Baseline

Bridge Sensitivity Analysis

Draft Plan (with and without new bridges)

Daily Measures	2016	2040 TransAction Baseline	Without new Bridges	With new Bridges	% Change
Motorized Trips	8,737,000	10,462,000	10,561,000	10,563,000	--
Auto Trips	7,862,000	9,432,000	9,438,000	9,444,000	0.1%
Transit Trips	876,000	1,030,000	1,123,000	1,119,000	-0.4%
Transit Share	10.0%	9.8%	10.6%	10.6%	--
Transit Boardings	1,002,000	1,359,000	1,552,000	1,539,000	-0.8%
Miles of Travel	104,838k	125,378k	124,863k	124,829k	--
Hours of Travel	3,298,000	5,811,000	4,462,000	4,387,000	-1.7%
Hours of Delay	1,007,000	3,030,000	1,717,000	1,645,000	-4.2%
Transit Crowding	10,800	20,100	7,200	7,100	-1.4%

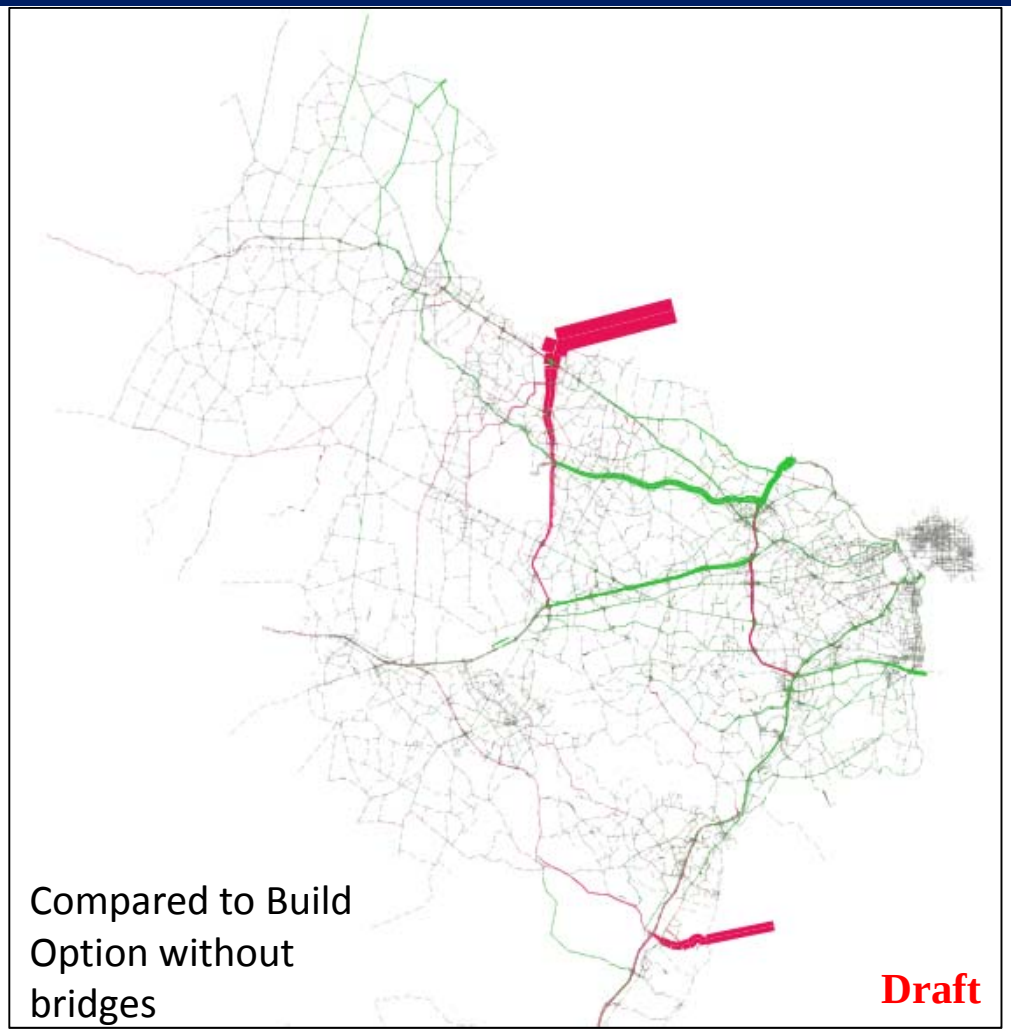
Draft Plan - Daily Bridge Volumes

Bridge	2016	2040 TransAction Baseline	Draft Plan (w/o Bridges)	Draft Plan (with bridges)	% Change
Route 15 Bridge	38,500	50,600	52,900	46,000	-13%
Route 28 Bridge				63,000	
American Legion Bridge	241,000	282,400	295,800	264,500	-11%
Chain Bridge	43,800	51,000	44,800	42,300	-6%
Key Bridge	39,300	45,000	47,900	47,000	-2%
Theodore Roosevelt Bridge	102,400	144,400	131,100	127,800	-3%
Arlington Memorial Bridge	52,600	50,000	46,900	45,000	-4%
14th Street Bridge	228,500	220,500	227,600	222,800	-2%
Woodrow Wilson Bridge	229,400	245,300	245,800	232,300	-6%
East River Crossing				26,500	
Harry Nice Bridge	27,900	42,300	44,200	41,500	-6%
TOTAL	1,003,300	1,131,600	1,137,200	1,159,900	2%

Draft Plan with bridges - Results

Volume Increase with Bridges

Volume Decrease with Bridges



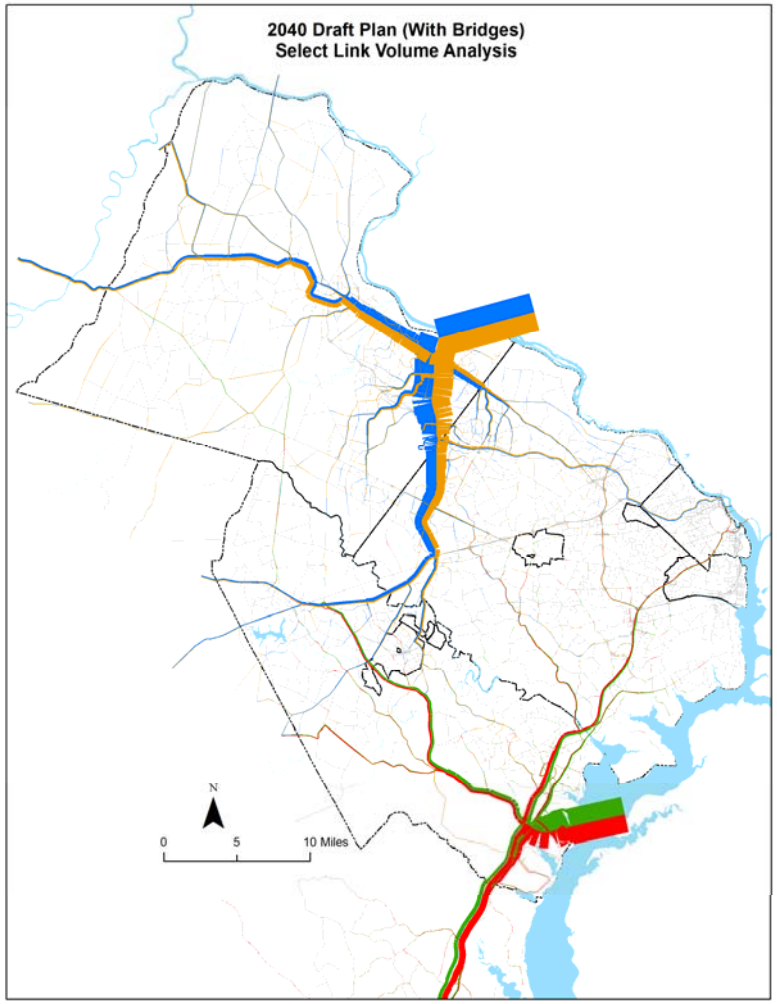
Compared to Build Option without bridges

Draft

NVTA's TransAction

Draft Plan with Bridges SelectLink Analysis

Origins/Destinations for Traffic on New Bridges

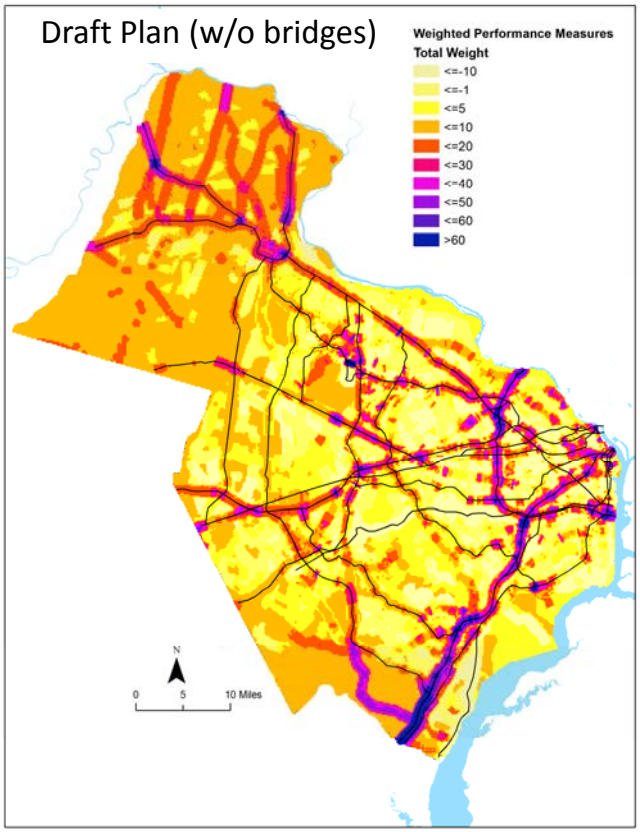


NVTA's TransAction

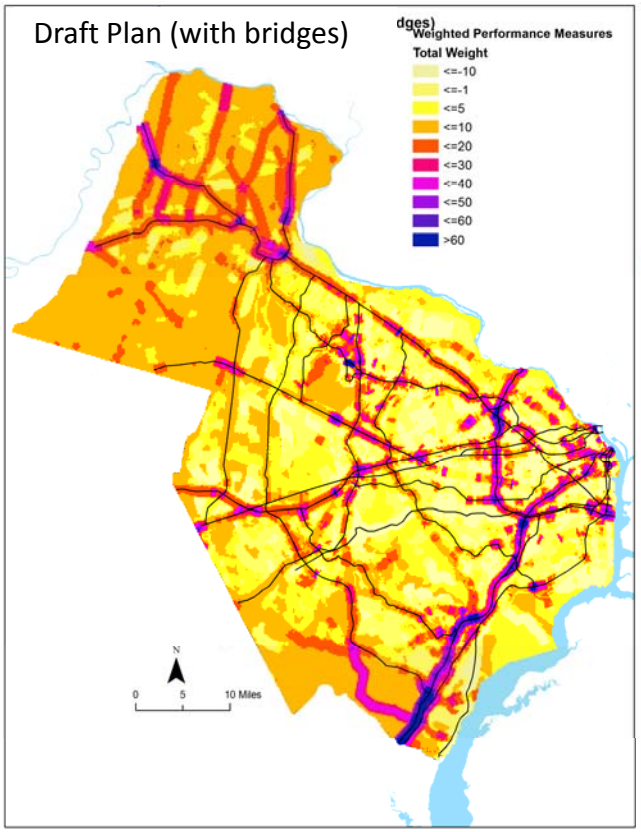
Performance Impact – New Bridges

Draft Plan with Bridges compared to Draft Plan without Bridges

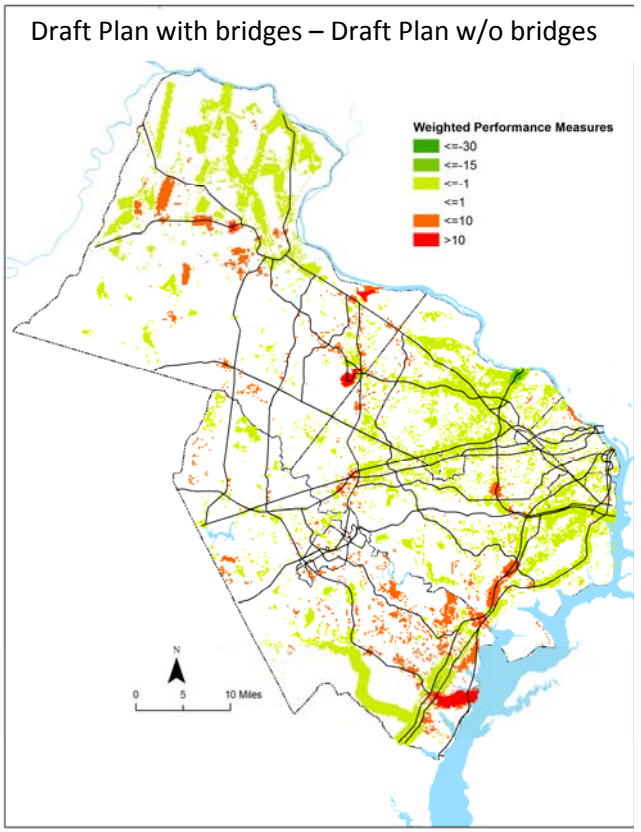
Draft Plan (w/o bridges)



Draft Plan (with bridges)



Draft Plan with bridges – Draft Plan w/o bridges



NVTA's TransAction

Draft Plan (with bridges): Initial Findings

- Forecast daily volumes:
  - 63,000 on north bridge; 13%↓ (Rt. 15), 11%↓ (ALB)
  - 26,000 on south bridge; 6%↓ (WWB)
  - No discernible through traffic between I-95S and MoCo
- Draft Plan with new bridges (compared to without new bridges):
  - Modest additional reductions in person hours of travel and hours of delay (1.7% and 4.2%)
  - Modest additional reduction in transit crowding (1.4%)
  - Slight mitigation of residual problem areas (I-495)

Scenario Analysis

Draft Plan – Scenario A Results (without bridges)

Daily Measures	2040 TransAction Baseline	Scenario A Baseline	Draft Plan Scenario A	% Change
Motorized Trips	10,462,000	10,847,000	10,931,000	0.8%
Auto Trips	9,432,000	9,731,000	9,640,000	-0.9%
Transit Trips	1,030,000	1,116,000	1,292,000	15.8%
Transit Share	9.8%	10.3%	11.8%	14.6%
Transit Boardings	1,359,000	1,382,000	1,622,300	17.4%
Miles of Travel	125,378k	127,818k	126,351k	-1.1%
Hours of Travel	5,811,000	4,305,000	3,835,000	-10.9%
Hours of Delay	3,030,000	1,324,000	952,000	-28.1%
Transit Crowding	20,100	13,800	7,100	-48.6%

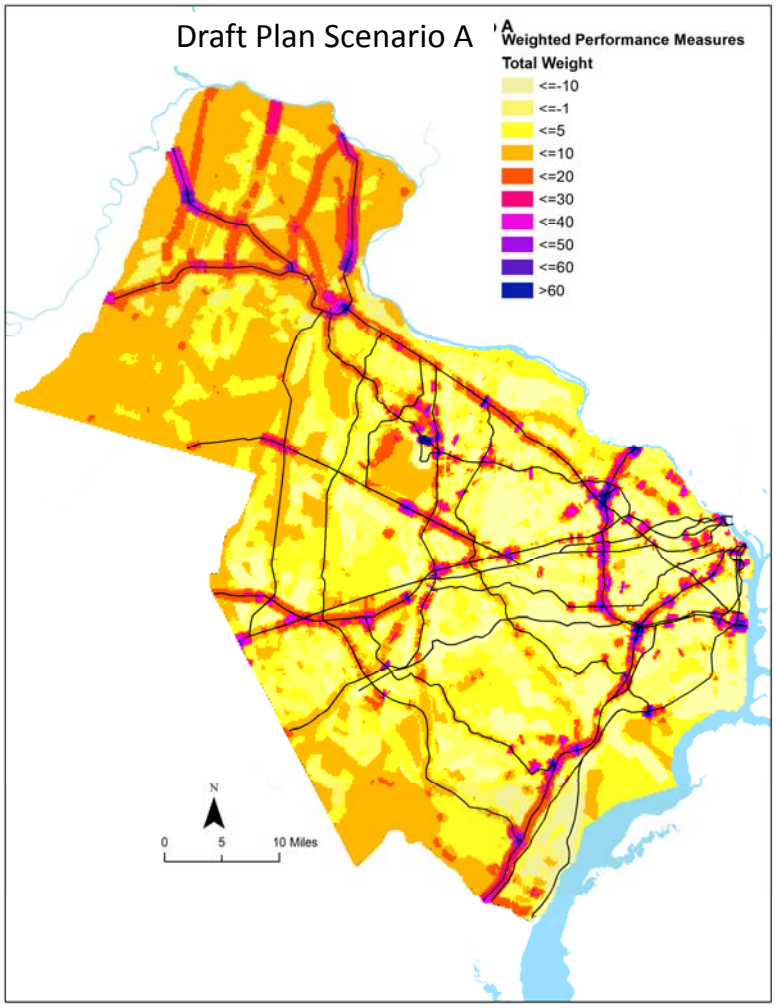
Transit Boardings

Daily Boardings	2040 TransAction Baseline	Scenario A Baseline	Draft Plan Scenario A	% Change
BRT/LRT	14,600	7,500	316,300	4117%
Metrorail	848,000	987,800	1,005,700	1.8%
VRE	26,800	27,500	30,500	10.9%
Other Routes	469,300	358,900	269,800	-24.8%
Total	1,358,700	1,381,700	1,622,300	17.4%

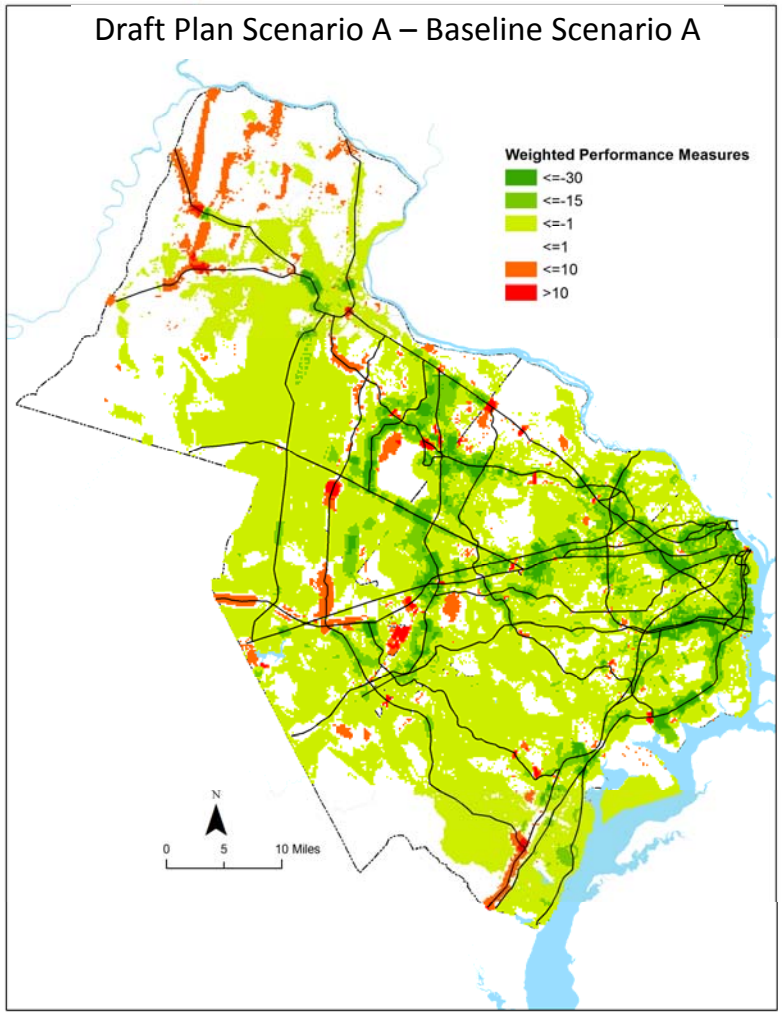
Draft Plan Scenario A Results

Draft Plan Scenario A compared to Baseline Scenario A

Draft Plan Scenario A



Draft Plan Scenario A – Baseline Scenario A

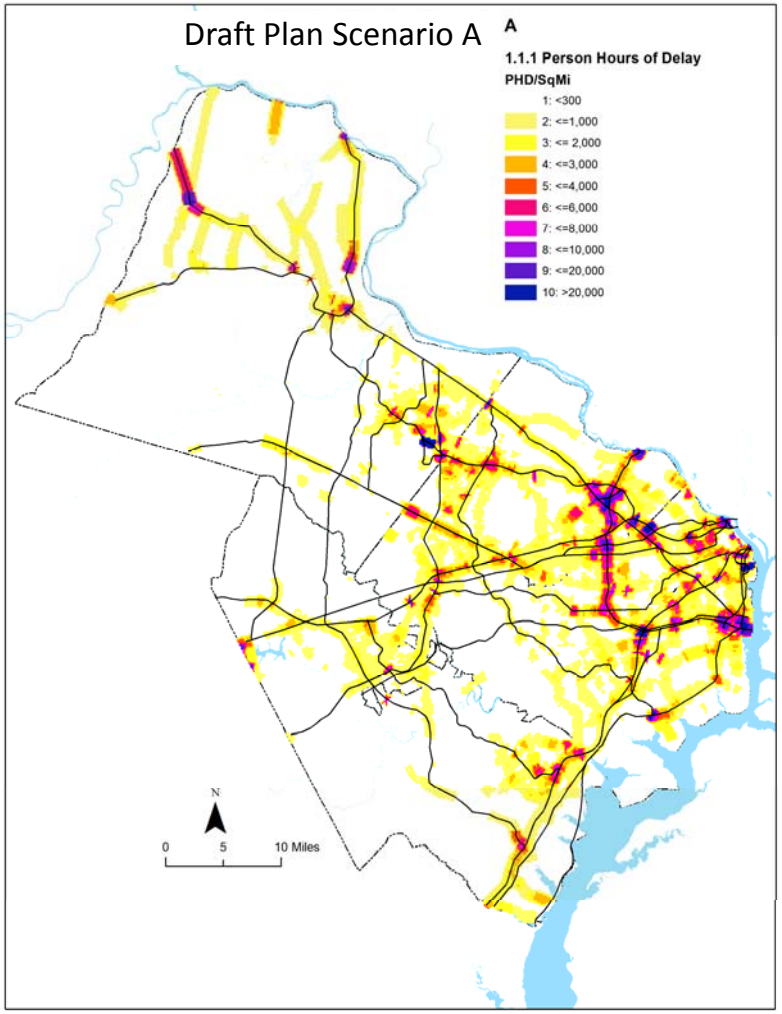


NVTA's TransAction

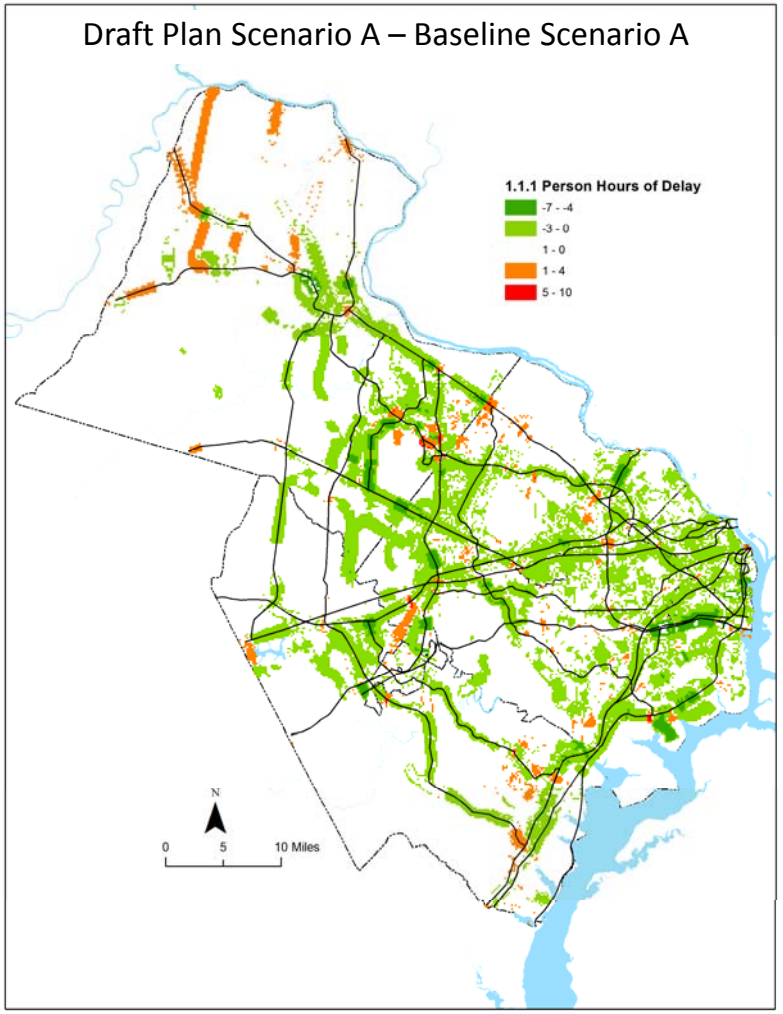
Draft Plan Scenario A Person Delay

Draft Plan Scenario A compared to Baseline Scenario A

Draft Plan Scenario A



Draft Plan Scenario A – Baseline Scenario A



NVTA's TransAction

Draft Plan – Scenario B Results (without bridges)

Daily Measures	2040 TransAction Baseline	Scenario B Baseline	Draft Plan Scenario B	% Change
Motorized Trips	10,462,000	10,063,000	10,144,000	8.0%
Auto Trips	9,432,000	9,071,000	9,053,000	-.2%
Transit Trips	1,030,000	992,000	1,033,000	4.1%
Transit Share	9.8%	9.9%	9.6%	3%
Transit Boardings	1,359,000	1,144,000	1,267,000	10.8%
Miles of Travel	125,378k	116,615k	115,489k	-1.0%
Hours of Travel	5,811,000	4,515,000	3,778,000	-16.3%
Hours of Delay	3,030,000	1,932,000	1,238,000	-35.9%
Transit Crowding	20,100	12,900	3,400	-73.6%

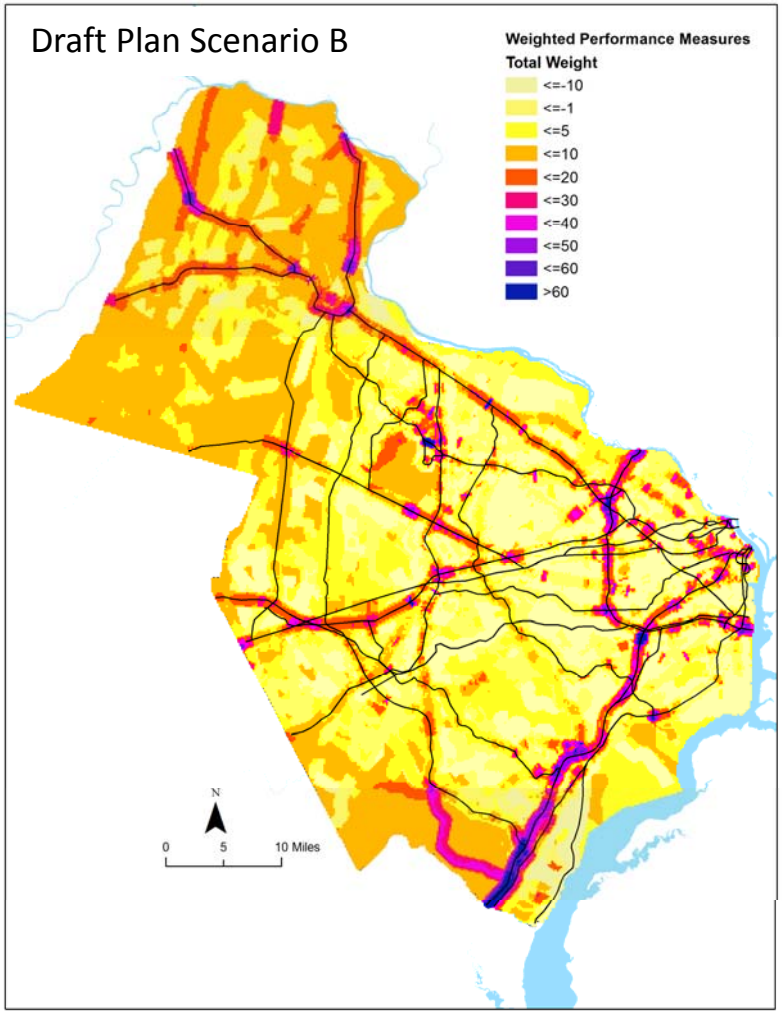
Transit Boardings

Daily Boardings	2040 TransAction Baseline	Scenario B Baseline	Draft Plan Scenario B	% Change
BRT/LRT	14,626	7,200	267,400	3614%
Metrorail	848,013	808,400	796,800	-1.4%
VRE	26,757	23,300	21,700	-6.9%
Other Routes	469,327	305,100	181,600	-40.5%
Total	1,358,723	1,144,000	1,267,500	10.8%

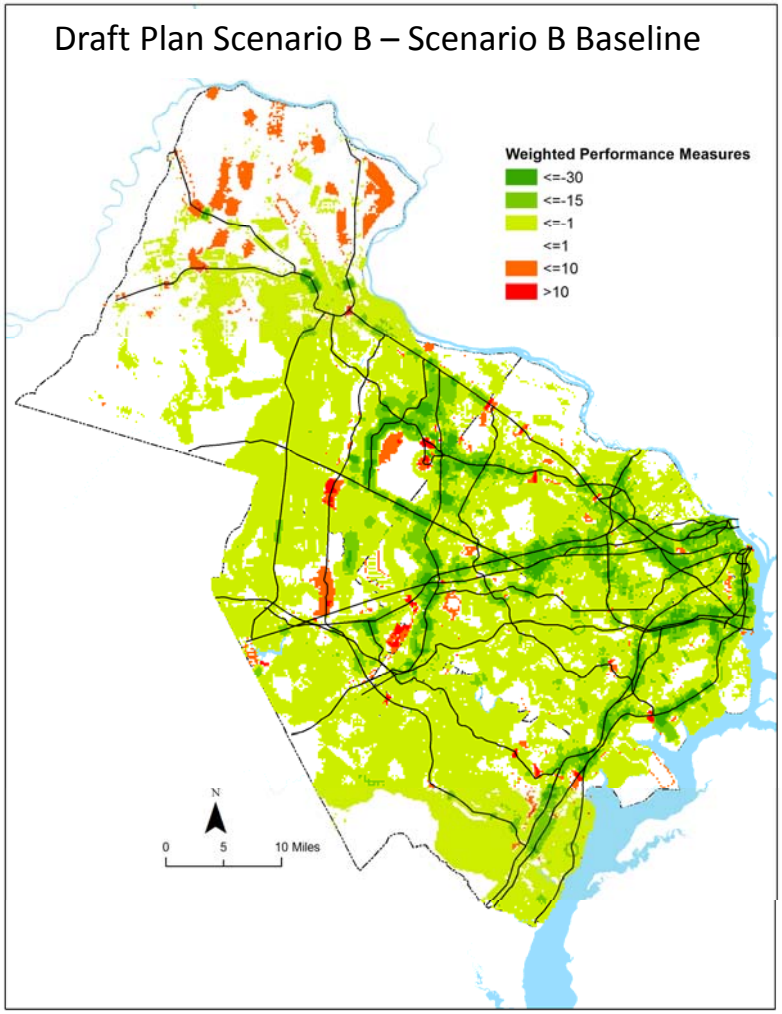
Scenario B Results

Draft Plan Scenario B compared to Baseline Scenario B

Draft Plan Scenario B



Draft Plan Scenario B – Scenario B Baseline

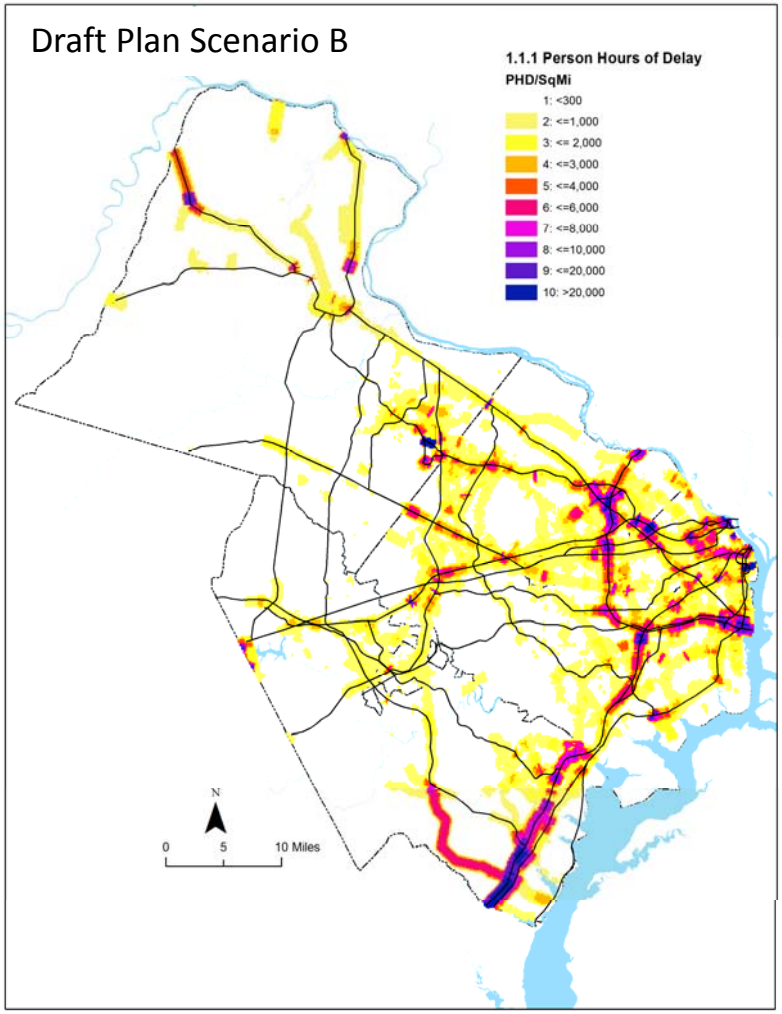


NVTA's TransAction

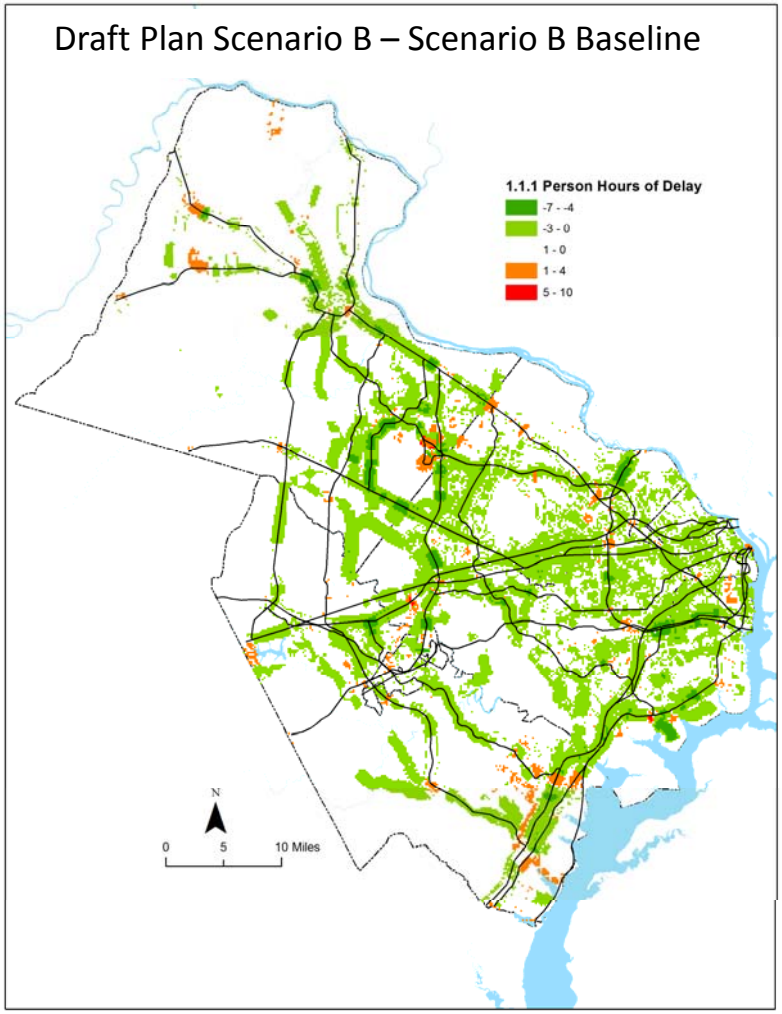
Scenario B - Person Delay

Draft Plan Scenario B compared to Baseline Scenario B

Draft Plan Scenario B



Draft Plan Scenario B – Scenario B Baseline



NVTA's TransAction

Draft Plan – Scenario C Results (without bridges)

Daily Measures	2040 TransAction Baseline	Scenario C Baseline	Draft Plan Scenario C	% Change
Motorized Trips	10,462,000	10,733,000	10,779,000	4.3%
Auto Trips	9,432,000	9,807,000	9,756,000	-0.5%
Transit Trips	1,030,000	926,000	1,033,000	11.6%
Transit Share	9.8%	8.6%	9.6%	11.6%
Transit Boardings	1,359,000	1,239,000	1,425,000	15.0%
Miles of Travel	125,378k	129,719k	126,722k	-2.3%
Hours of Travel	5,811,000	5,850,000	4,533,000	-22.5%
Hours of Delay	3,030,000	2,996,000	1,741,000	-41.9%
Transit Crowding	20,100	16,500	6,000	-63.6%

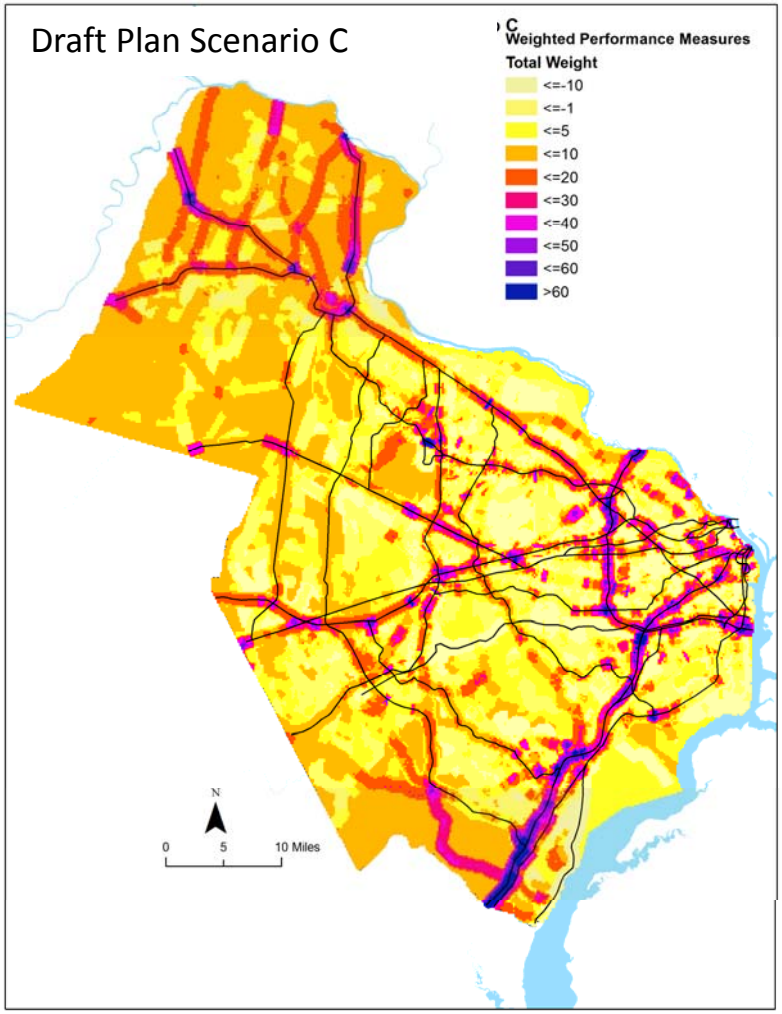
Transit Boardings

Daily Boardings	2040 TransAction Baseline	Scenario C Baseline	Draft Plan Scenario C	% Change
BRT/LRT	14,626	16,100	202,800	1160%
Metrorail	848,013	757,600	834,600	10.2%
VRE	26,757	23,800	25,100	5.5%
Other Routes	469,327	442,500	362,900	-18.0%
Total	1,358,723	1,239,000	1,425,400	15.0%

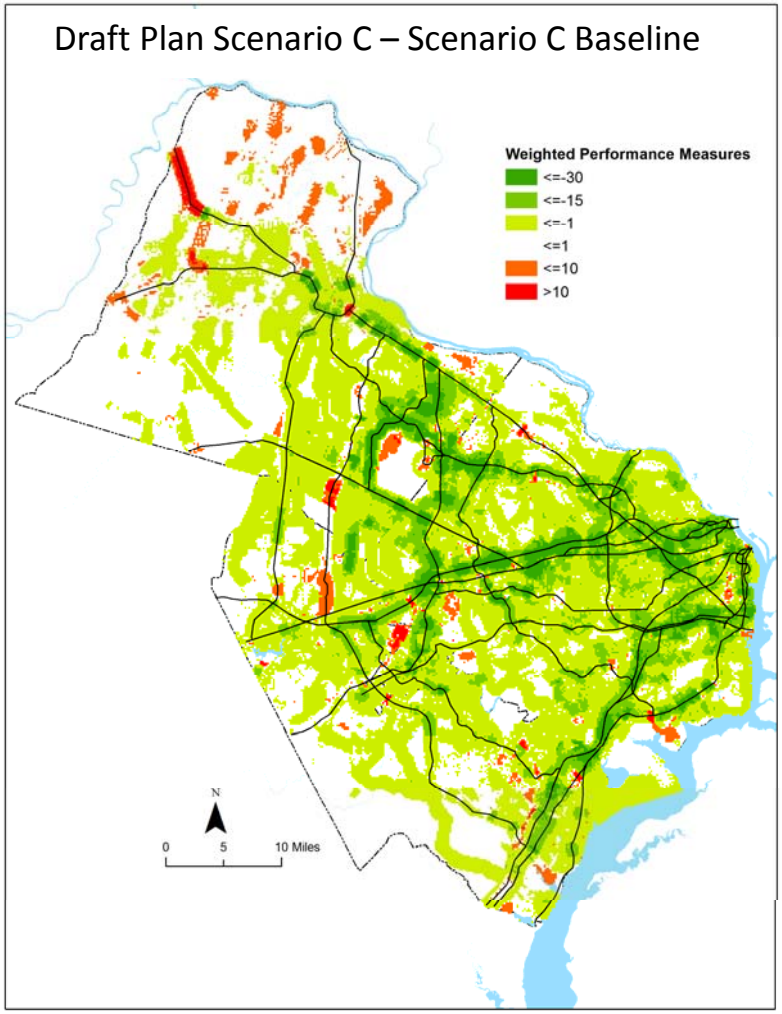
Scenario C Results

Draft Plan Scenario C compared to Baseline Scenario C

Draft Plan Scenario C



Draft Plan Scenario C – Scenario C Baseline

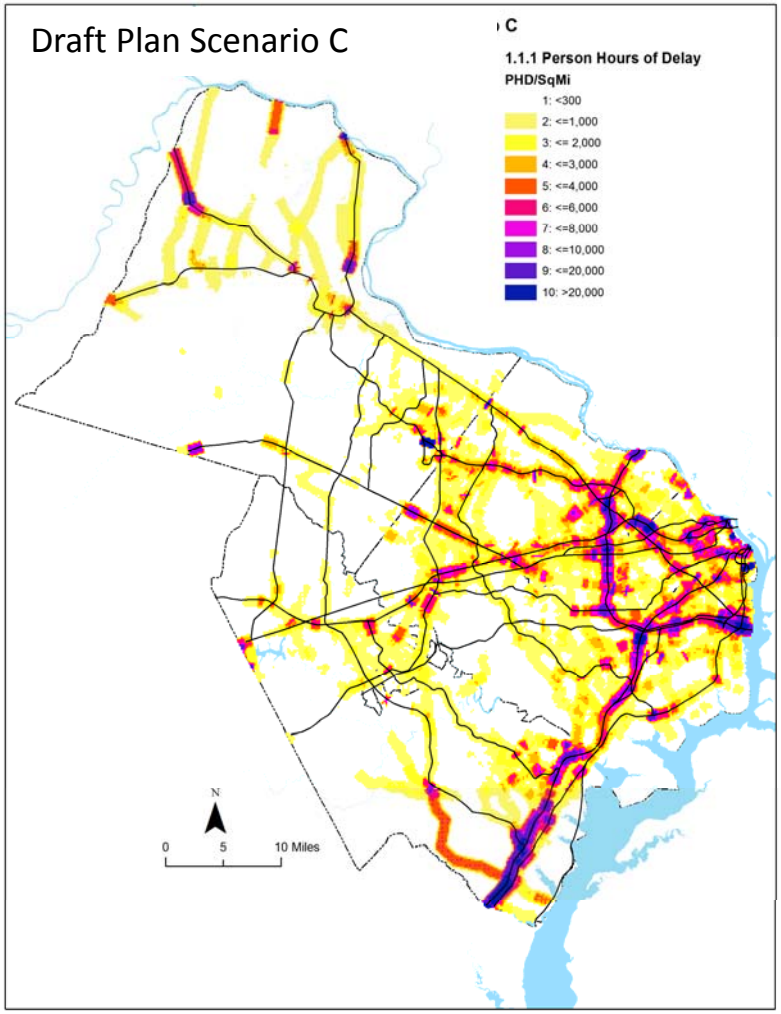


NVTA's TransAction

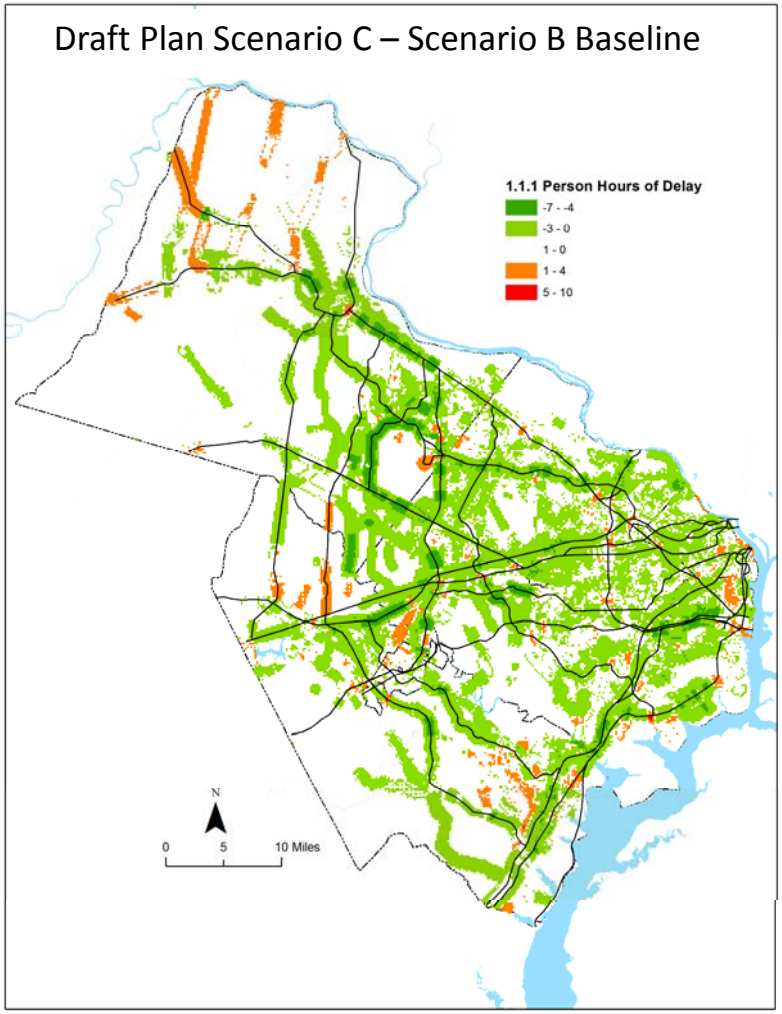
Scenario C - Person Delay

Draft Plan Scenario C compared to Baseline Scenario C

Draft Plan Scenario C



Draft Plan Scenario C – Scenario B Baseline



NVTA's TransAction

Draft Plan – Scenario D Results (without bridges)

Daily Measures	2040 TransAction Baseline	Scenario D Baseline	Draft Plan Scenario D	% Change
Motorized Trips	10,462,000	10,320,000	10,402,000	0.8%
Auto Trips	9,432,000	9,284,000	9,229,000	-0.6%
Transit Trips	1,030,000	1,037,000	1,173,000	13.1%
Transit Share	9.8%	10.0%	11.3%	13.0%
Transit Boardings	1,359,000	1,389,000	1,609,000	15.6%
Miles of Travel	125,378k	121,587k	118,942k	-2.2%
Hours of Travel	5,811,000	5,188,000	4,278,000	-17.5%
Hours of Delay	3,030,000	2,520,000	1,664,000	-34.0%
Transit Crowding	20,100	19,700	7,800	-60.4%

NVTA's TransAction

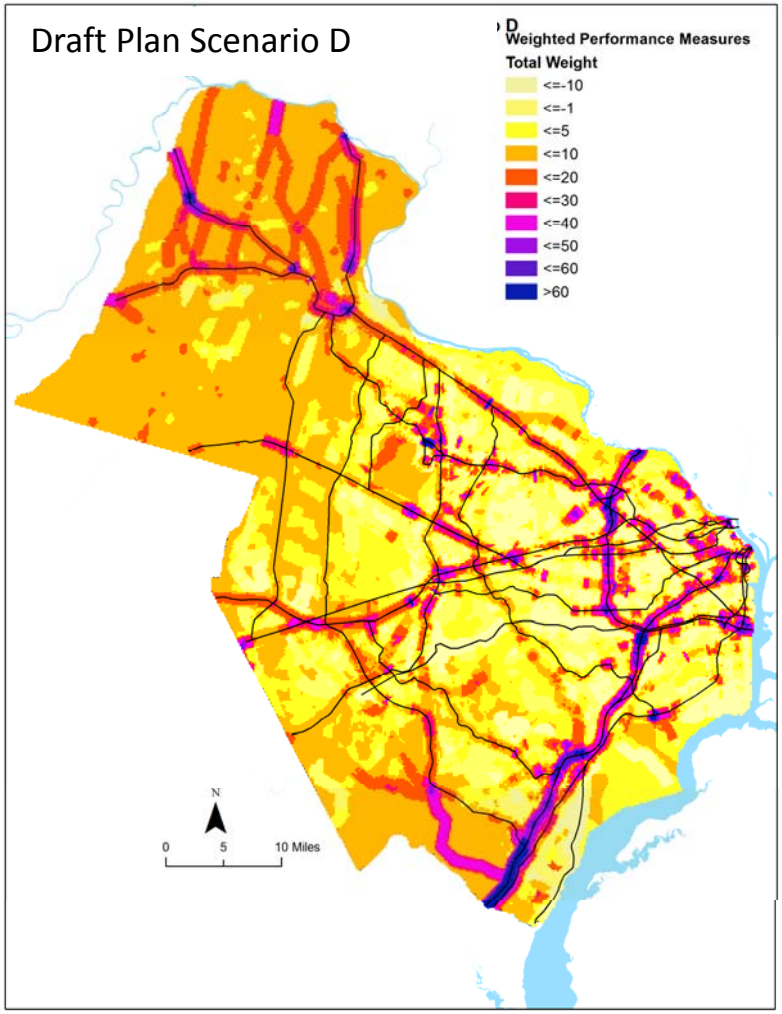
Transit Boardings

Daily Boardings	2040 TransAction Baseline	Scenario D Baseline	Draft Plan Scenario D	% Change
BRT/LRT	14,626	15,600	269,700	1629%
Metrorail	848,013	853,800	923,300	8.1%
VRE	26,757	24,800	26,800	8.1%
Other Routes	469,327	495,000	387,600	21.7%
Total	1,358,723	1,389,200	1,609,400	15.9%

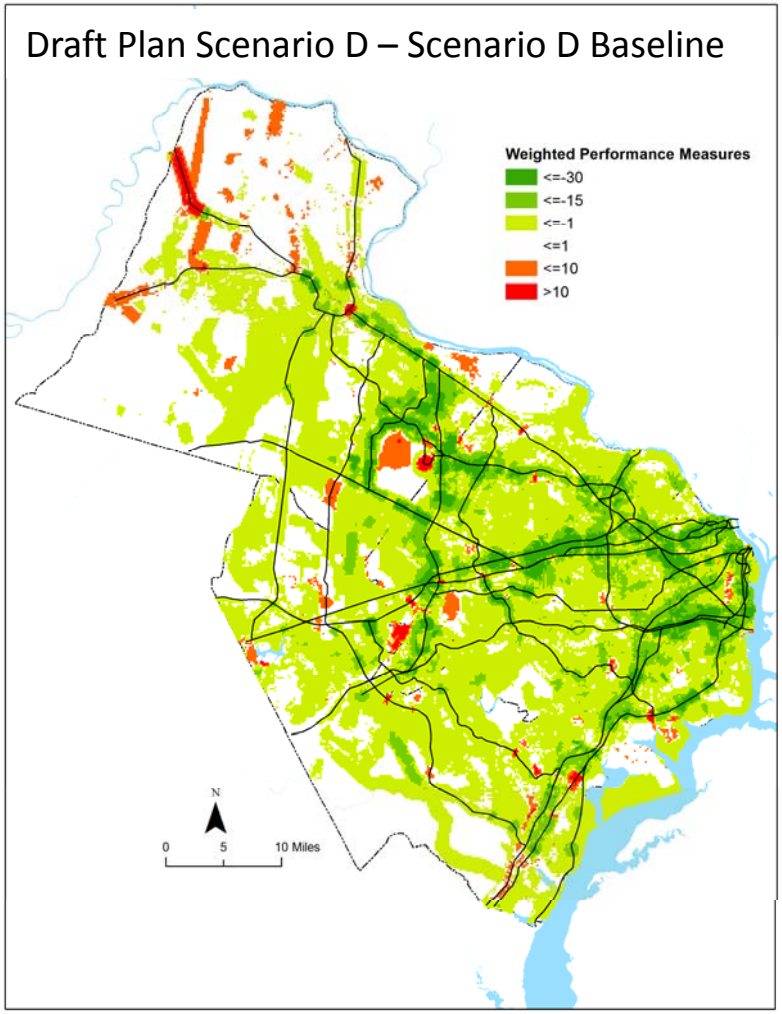
Scenario D Results

Draft Plan Scenario D compared to Baseline Scenario D

Draft Plan Scenario D



Draft Plan Scenario D – Scenario D Baseline

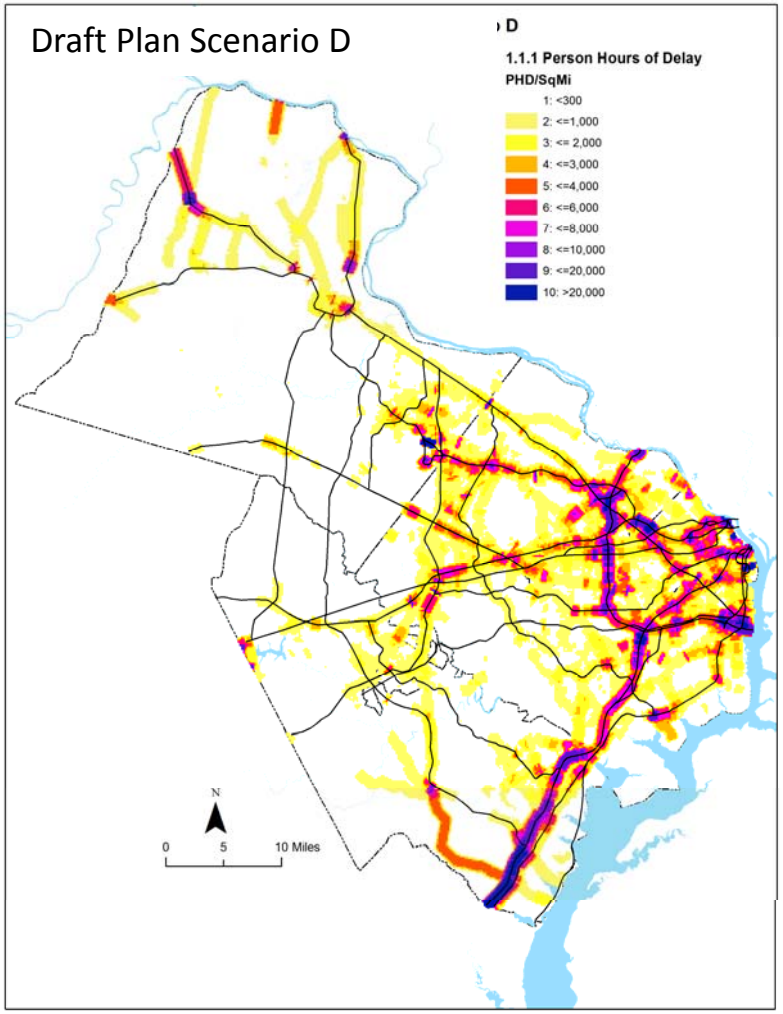


NVTA's TransAction

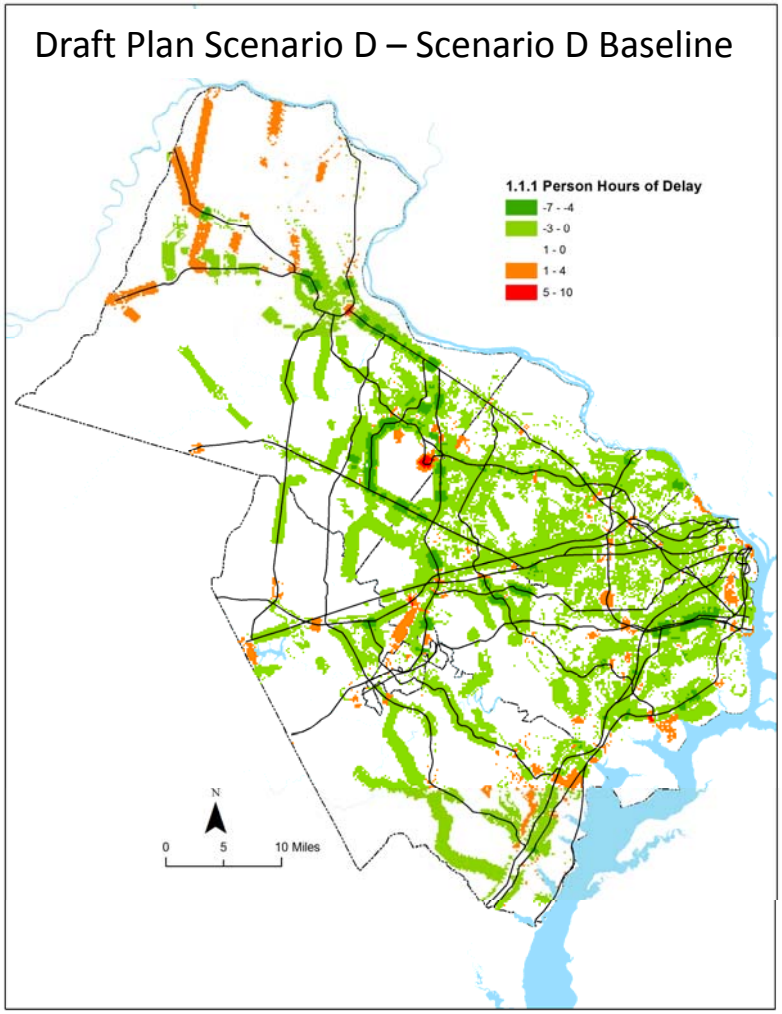
Scenario D - Person Delay

Draft Plan Scenario D compared to Baseline Scenario D

Draft Plan Scenario D



Draft Plan Scenario D – Scenario D Baseline



NVTA's TransAction

Scenario Analysis: Key Findings

- Draft Plan increases transit ridership, decreases transit crowding and decreases delay in all Future Scenarios
- Draft Plan has biggest impacts under baseline assumptions and Scenario C (but they have the most Delay to start with)
- Areas with remaining problems similar across Scenarios (I-95, I-495, etc.)

	Hours of Delay Decreased	
Standard Future	1,312,700	43.3%
Scenario A	372,000	28.1%
Scenario B	694,500	35.9%
Scenario C	1,254,800	41.9%
Scenario D	855,700	34.0%

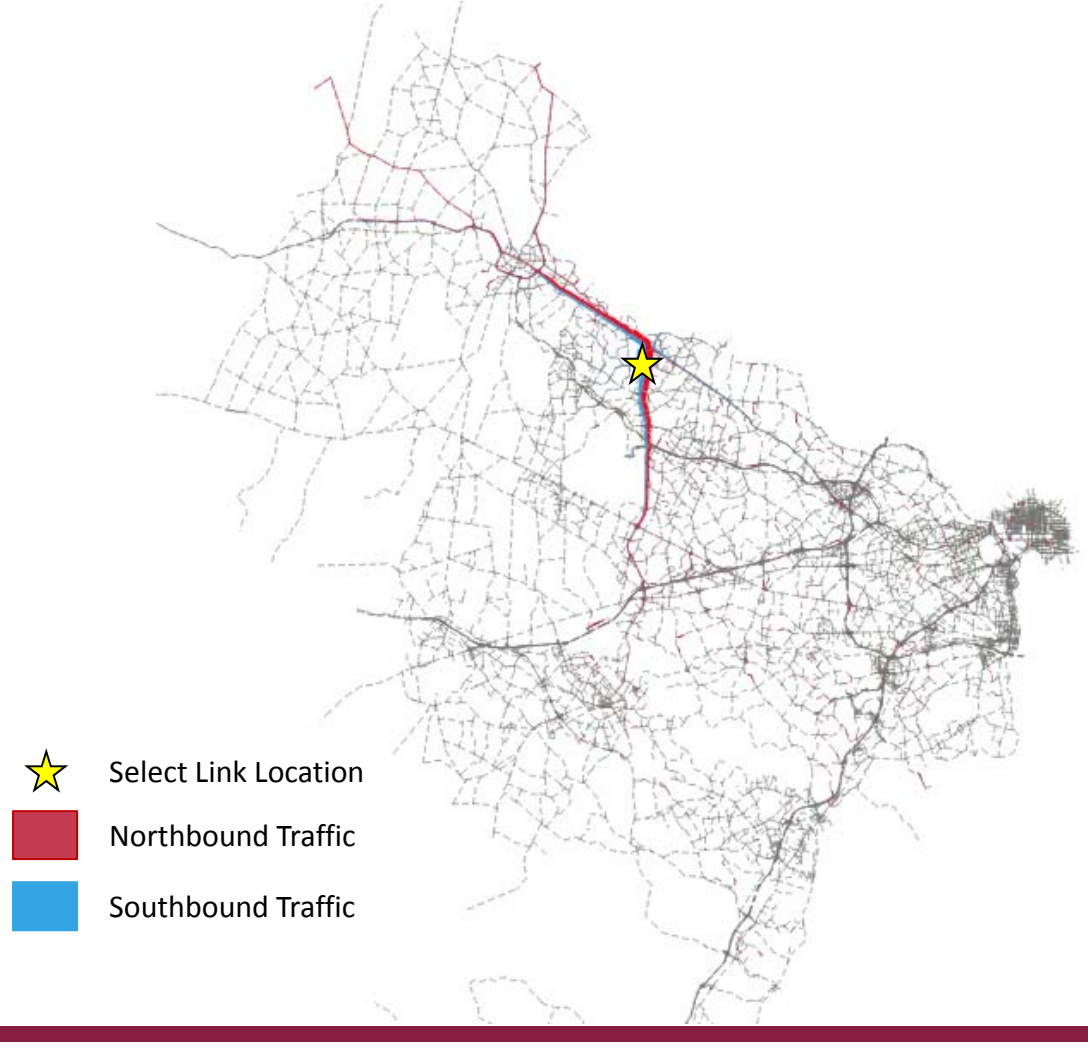
Next Steps

- Preview of detailed findings and recommendations during May 2017
- Official release of draft TransAction plan June 8, 2017
- Open House and Public Hearing July 13, 2017; tentative public comment period June 9 thru July 23; includes optional Town Hall meetings
- Adoption of TransAction plan October 12, 2017

Supplementary Information

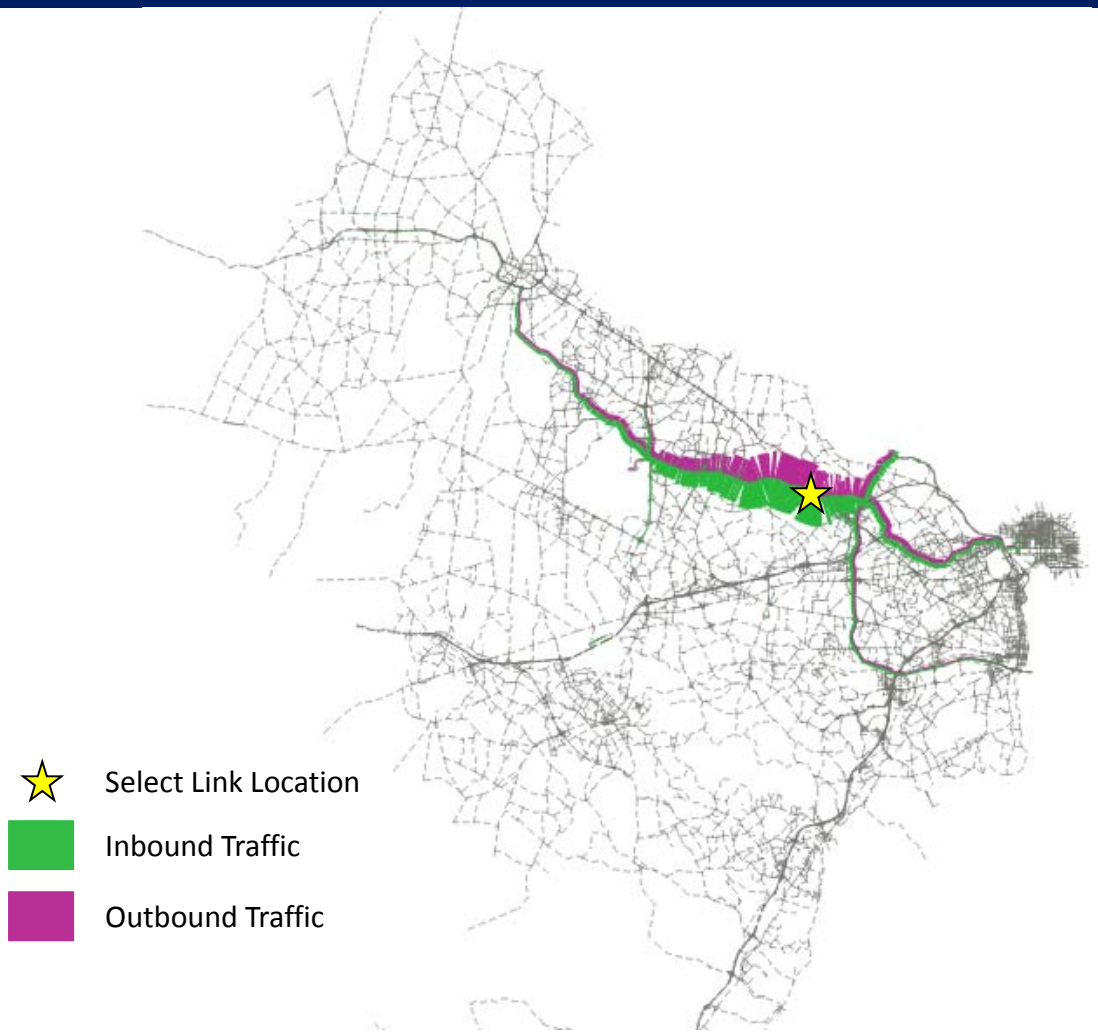
Select Link Analysis – 2040 Baseline

VA 28 @ Sterling



Select Link Analysis – 2040 Baseline

VA 267 @ Tysons



Grid Map Values

- Grid Scores calculated to highlight problem areas
- High Total Score = Poor Performance
  - Results for each performance measure divided into 10 bins (see next slide)
  - Measure weights multiplied by the bin score
  - Then added or subtracted to total score
- Changes on a facility are distributed to all nearby grids

Added to Total Score	Subtracted from Total Score
1.1.1 Total Person Hours of Delay	1.3.1 % of pop/jobs with ½ mile of high-quality transit
1.1.2 Transit Crowding	1.3.2 Number of jobs accessible
1.1.3 Person-Hours of Congested Travel in Autos	1.4.2 Walkable/bikeable RAC
1.1.4 Person-Hours of Congested Travel on Transit	2.2.1 First/last mile connections
1.2.1 Congestion Severity	2.3.1 Vehicle Productivity
1.2.2 Congestion Duration	
1.4.1 Avg Travel Time between RACs	
2.1.1 Safety	
2.4.1 Resiliency	
3.1.1 Emissions	

Grid Map Values

		Goal 1: Enhance quality of life and economic strength of Northern Virginia through transportation										Goal 2: Enable optimal use of the transportation network and leverage the existing network				Goal 3: Reduce negative impacts	Grid Score
		1.1 Congestion Reduction				1.2 Travel Time Reliability		1.3 Accessibility		1.4 Activity Center Connectivity		2.1 Safety	2.2 System Integration	2.3 Vehicle Productivity	2.4 Resiliency	3.1 Emissions Reduction	
NVTA's TransAction Transportation Action Plan for Northern Virginia		1.1.1 Total Person Hours of Delay **(HB 599)**	1.1.2 Transit Crowding [transit route-miles] **(HB 599)**	1.1.3 Person Hours of Congested Travel in Automobiles **(HB 599)**	1.1.4 Person Hours of Congested Travel in Transit Vehicles **(HB 599)**	1.2.1 Congestion Severity: Maximum Travel Time Ratio	1.2.2 Congestion Duration [hours*lane-miles] **(HB 599)**	1.3.1 Percentage of jobs / population within 1/2 mile of high quality transit	1.3.2 Number of jobs within 45 minutes by auto or within 60 mins by transit **(HB 599)**	1.4.1 Average travel time per trip between Regional Activity Centers [minutes]	1.4.2 Walkable / bikeable environment within a Regional Activity Center	2.1.1 Safety of the transportation system	2.2.1 First and last mile connections	2.3.1 Person Miles per Vehicle Mile	2.4.1 Person Hours of travel caused by 10% increase in PM peak hour demand **(HB 599)**	3.1.1 Vehicle miles traveled (VMT) at speeds with high emission rates	
Measure Weights		**10%**	**5%**	**5%**	**5%**	**5%**	**10%**	**5%**	**5%**	**5%**	**5%**	**5%**	**10%**	**10%**	**5%**	**10%**	**100%**
Influence on Total (⇧⇩)		⇧	⇧	⇧	⇧	⇧	⇧	⇩	⇩	⇧	⇩	⇧ 1	⇩ -1	⇩ -1	⇧ 1	⇧	⇧
Bin Values	**1**	300	2	640	32	1.0	13	0	200,000	N/A	N/A	20	0	1.50	96	3,000	**(10)**
	2	1,000	4	1,280	64	1.5	26	20	400,000	30	1	50	1	1.50	256	10,000	**(1)**
	3	2,000	6	2,560	128	2.0	38	40	600,000	32	2	115	2	1.65	512	20,000	**5**
	4	3,000	8	3,840	256	2.5	64	60	800,000	34	3	200	3	1.70	1,024	32,000	**10**
	5	4,000	10	5,120	512	3.0	128	80	1,000,000	36	4	300	4	1.75	1,536	45,000	**20**
	6	6,000	20	6,400	768	4.0	256	85	1,500,000	38	6	450	5	1.80	2,240	60,000	**30**
	7	8,000	40	12,800	1,280	5.0	384	90	2,000,000	40	8	600	7	1.85	2,880	85,000	**40**
	8	10,000	60	19,200	1,920	6.0	512	94	2,500,000	45	10	750	10	1.90	3,840	120,000	**50**
	9	20,000	80	32,000	2,560	8.0	640	98	3,000,000	50	12	1,200	14	1.95	6,400	160,000	**60**
	10	>20,000	>80	>32,000	>2,560	>8.0	>640	>98	>3,000,000	>50	>12	>1,200	>14	>1.95	>6,400	>160,000	**>60**
Units		PHD/SqMi	RouteMi /SqMi	Cong PHT /SqMi	Cong PHT /SqMi	Max Hour	Hours*Mi /SqMi	Percent	Jobs	Minutes	Qual Score	EPDO Value	Qual Score	PMT/VMT	PMT/SqMi	VMT/SqMi	**Weight Total**

NVTA's TransAction

Scenario A Technology

- Increase person throughput capacity
- Reduce maximum travel speed
- Improve the relationship between volume and speed
- Increase traffic controls/operational performance
- Increase access to transit
- Increase the number of trips
- Increase peak period travel
- Increase trip lengths
- Increase out-of-pocket cost and reduce parking cost
- Increase shared ride mode shares

Scenario A
Technology makes driving easier

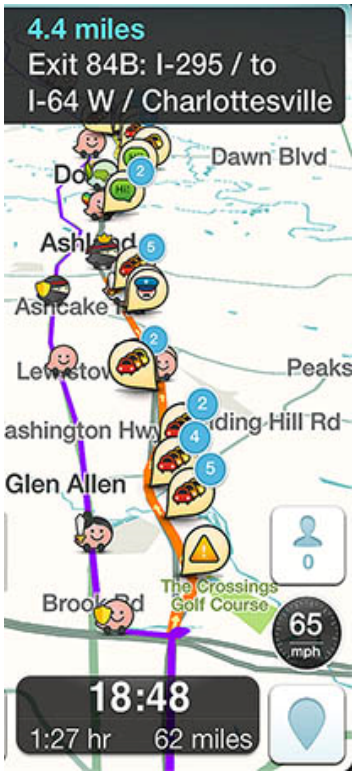
Autonomous Vehicles

Source: U.S. DOT

Shared Travel Alternatives

Source: flickr.com

Real Time Traveler Info



Source: flickr.com

Travel Impacts

- Less congestion
- More efficient vehicle travel
- More first/last mile trip and short trip options

NVTA's TransAction

Scenario B
Changes in travel behavior

Urban Living + Mixed Use Centers

Source: flickr.com

Telecommuting Options

Source: pexels.com

Increase in Fuel and Travel Costs

Source: flickr.com

Travel Impacts

- Less vehicle travel
- Shorter trips
- Less peak period travel
- More first/last mile and short trip options
- More delivery vehicles

NVTA's TransAction

Scenario B Travel Behavior

- Reduce vehicle throughput capacity
- Reduce maximum travel speed
- Improve the relationship between volume and speed
- Increase traffic controls/operational performance
- Increase access to transit in urban areas and around rail stations
- Reduce the number of trips
- Time of day trip distribution is less peaked
- Reduce trip lengths
- Increase out-of-pocket cost and parking cost
- Increase transit and shared ride mode shares

RH1

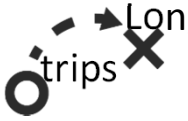
Scenario C
Dispersed land use growth

Future growth in population and employment primarily occurs in suburban areas outside regional activity centers

WORKING

Travel Impacts

More auto trips



Longer distance commute trips

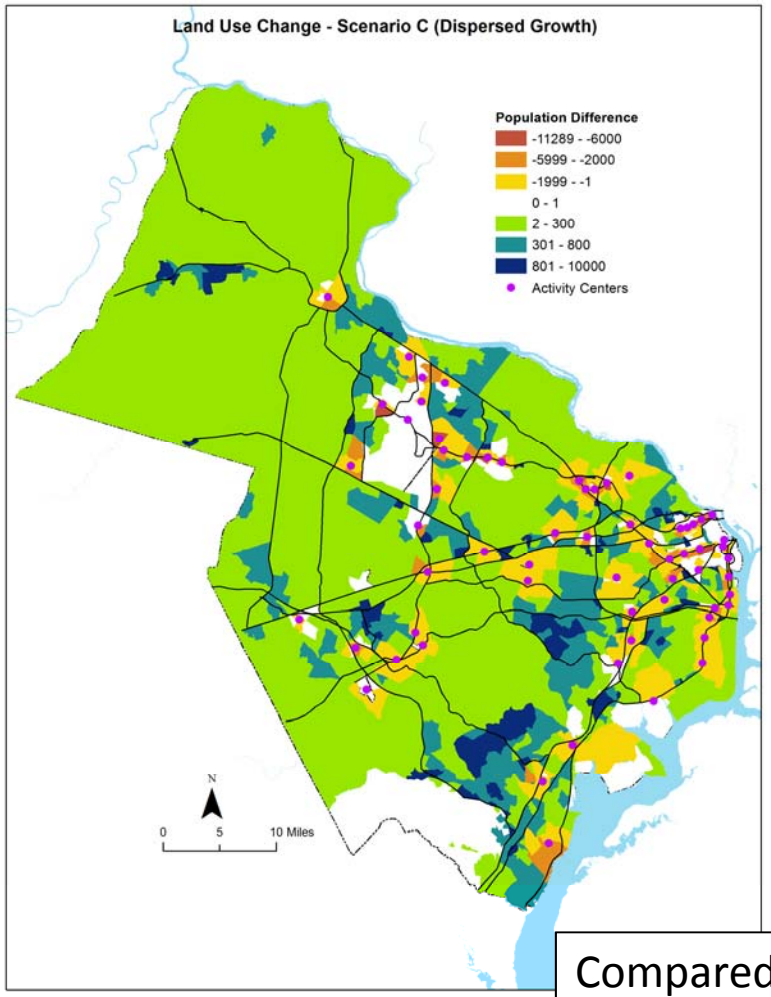
Fewer transit trips, transit less effective

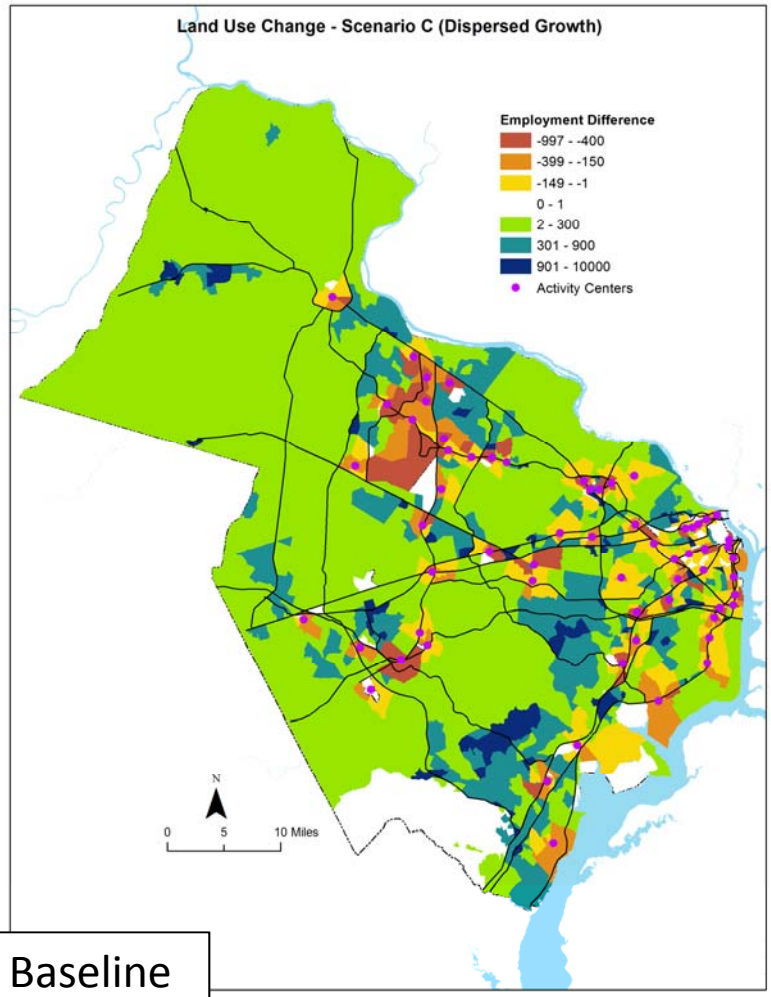
NVTA's TransAction

Slide 75

RH1 Reinhold, Herbert, 4/13/2017

Scenario C Land Use





Compared to Baseline

NVTA's TransAction

Scenario D
Concentrated land use growth

Future growth in population and employment primarily occurs within regional activity centers

WORKING

Travel Impacts

Fewer auto trips

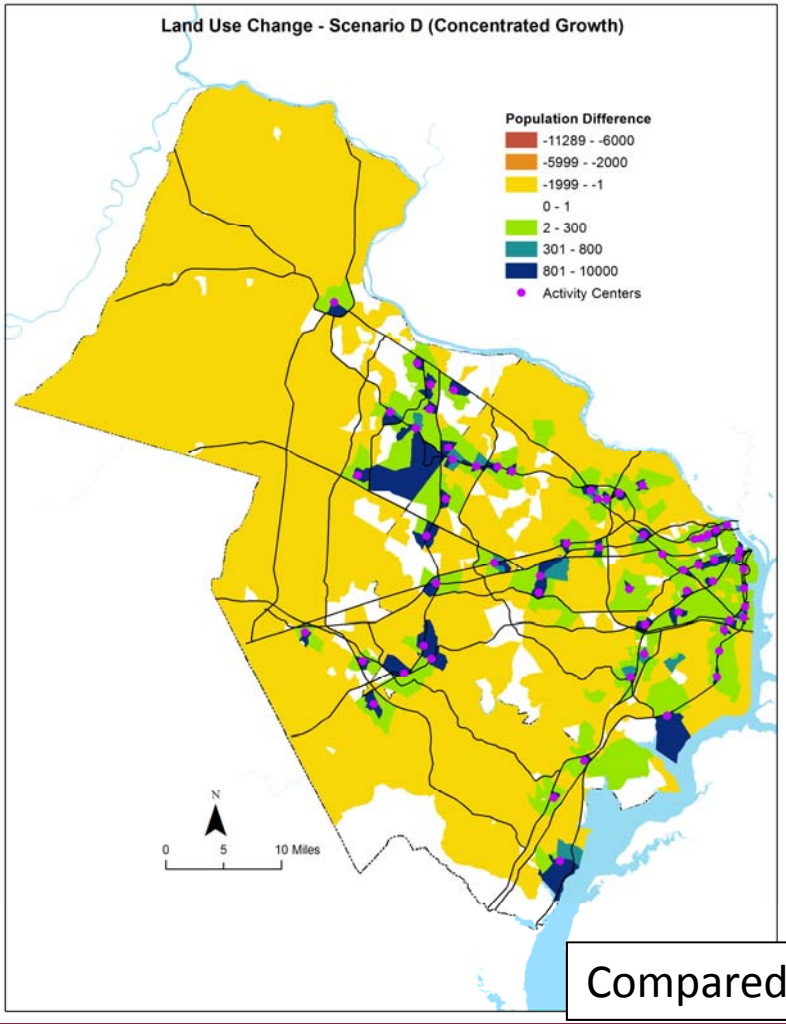
More transit and non-motorized trips

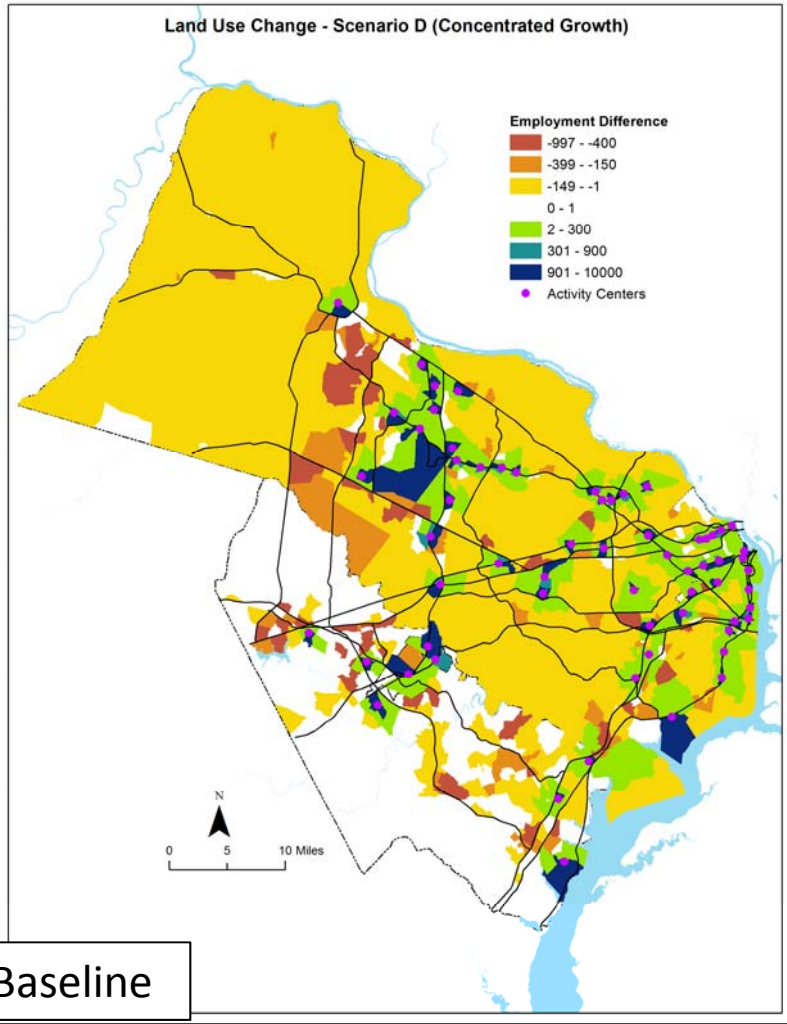
Shorter commute trips

Transit more effective

NVTA's TransAction

Scenario D Land Use





Compared to Baseline

NVTA's TransAction