Springfield to Quantico Enhanced Public Transportation Feasibility Study

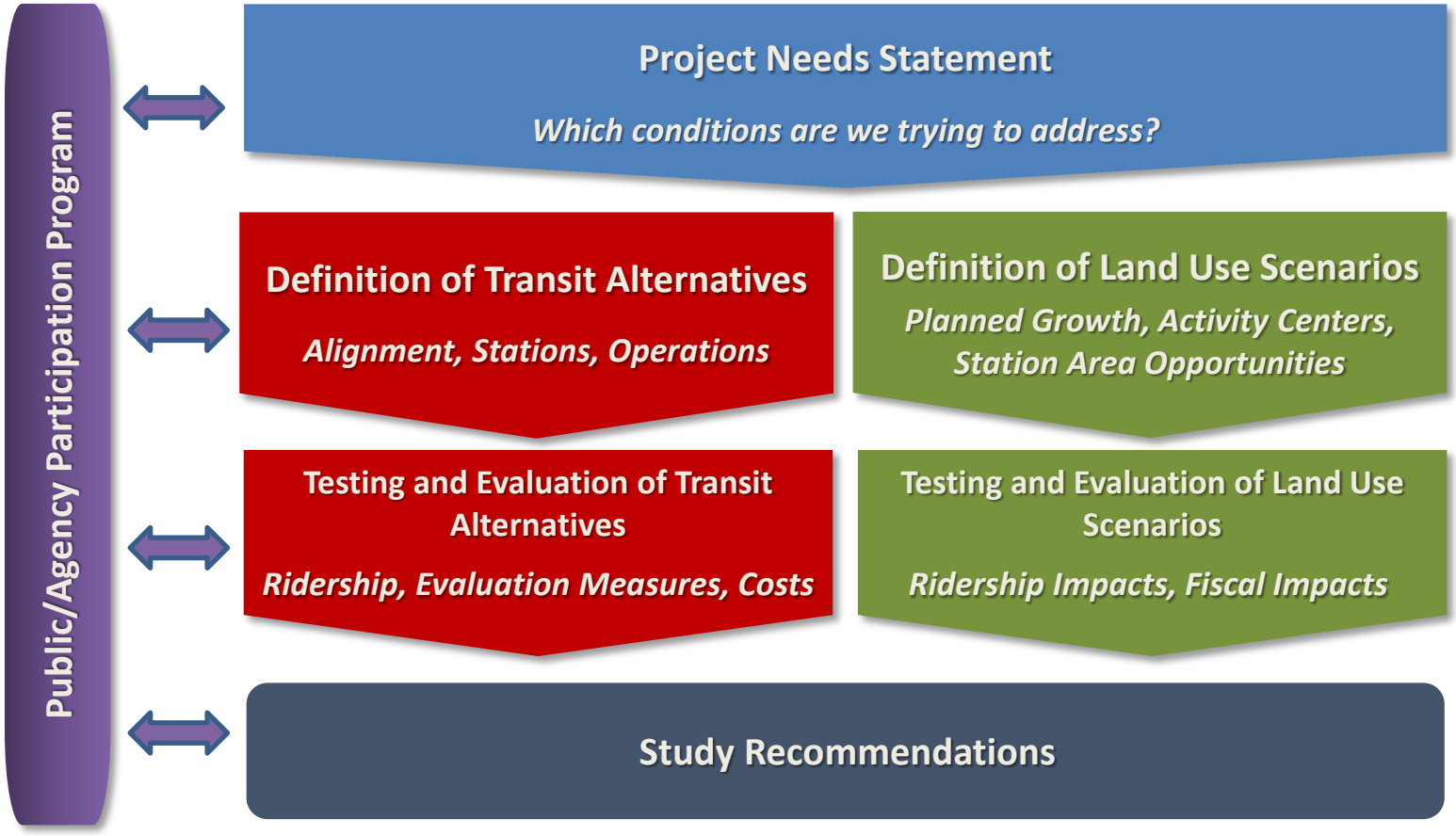
Technical Advisory Committee Meeting #9
August 26, 2021

Virginia Department of Rail and Public Transportation

Meeting Agenda

- Introductions / Welcome
- Public and Stakeholder Outreach Status
- Summary of Evaluation Results
- Sensitivity Tests
- Land Use Assessment
- Next Steps – Future TAC Meetings

Study Technical Approach



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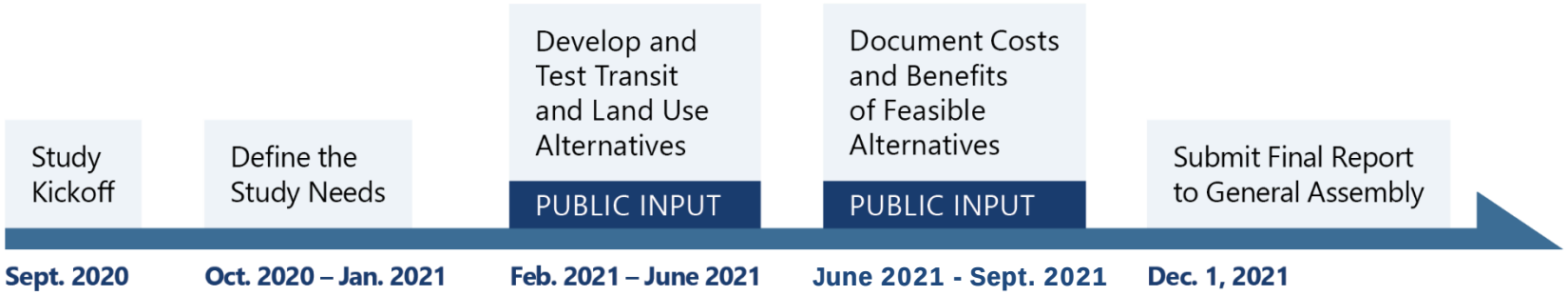
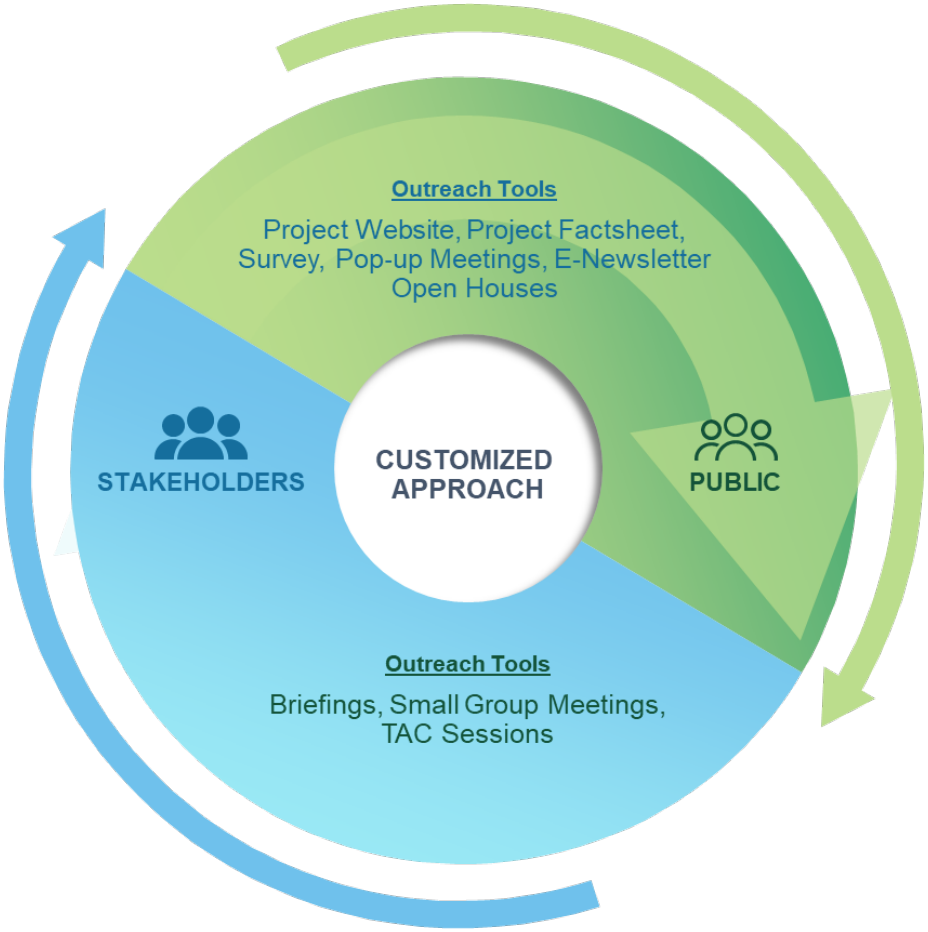
Study Schedule



Public and Stakeholder Outreach

Outreach Status

- Completed Activities
  - Virtual Public Meeting (July 27th)
- Upcoming Activities
  - Elected Officials Briefing - September
  - 3rd Round Virtual Public Meetings – September 21st and 23rd



http://www.drpt.virginia.gov/transit/springfield-to-quantico/

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September Public Meetings

- Key Objectives:
  - Summarize findings
  - Show impact of land use assumptions
  - Provide context on next steps for future investment
- Pop-ups will be held to distribute flyers
- Help us get the word out!

YOU'RE INVITED!

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Join us for a public meeting about potential transit enhancements for Fairfax and Prince William counties.

The Virginia Department of Rail and Public Transportation (DRPT) is conducting a feasibility study of enhanced public transportation services between the Franconia-Springfield Metro station in Fairfax County and the Quantico Marine Base in Prince William County. Enhanced transit could include options such as new and enhanced express bus services, increased VRE commuter rail service levels, Bus Rapid Transit (BRT), or an extension of Metrorail.

DRPT is offering the same meeting on two nights for your convenience.

Register ahead of the meeting by scanning the QR code or visiting:

www.drpt.virginia.gov/about/public-involvement/

Tuesday, September 21, 2021, 7 p.m.

Thursday, September 23, 2021, 7 p.m.

For more information and to stay up to date on the study progress and upcoming public involvement opportunities visit our study website:
www.drpt.virginia.gov/transit/springfield-to-quantico/

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Foreign language and hearing impaired interpreter services will be provided with seven days advance notice upon request.

Questions?

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Summary of Evaluation Results

How will we evaluate feasibility?

Goals for Enhanced Transit

Ridership Potential  Increase transit usage in the study corridor	**Congestion Mitigation**  Reduce the amount of traffic congestion in the study corridor	**Equity**  Provide a fair distribution of costs and benefits across different population groups
Regional Accessibility/ Connectivity  Increase access to regional activity centers and meet identified service gaps	**Cost-effectiveness**  Ensure that resources are used efficiently	**Development Potential**  Create opportunities for development around stations or stops

Summary of Evaluation Results

Goal	Measure	Additional Express Bus Service	BRT Extension	Additional VRE Service*	Metrorail Blue Extension	Metrorail Yellow Extension
Ridership Potential	Total Transit Boardings	71,000	80,600	69,900	77,900	76,900
	New Transit Boardings	1,100	10,700	-	8,000	7,000
	New Transit Trips	953	4,696	256	10,592	15,034
	Change in Transit PMT	50,674	103,952	19,831	408,917	462,541
Congestion Mitigation	Change in Congested VMT	(25,617)	(45,094)	(18,607)	(131,780)	(180,391)
Regional Accessibility	Walk Access to Population	31,796	62,038	18,014	37,288	72,486
	Walk Access to Jobs	20,431	37,555	12,051	41,827	34,285
	Change in Regional Job Accessi	0.0%	1.2%	0.4%	6.8%	7.2%
	Change in Access to Job Center	0.5%	5.4%	0.4%	12.0%	20.6%
Equity	New EEA Transit Trips	520	2,599	153	4,346	9,122
	Change in EEA Job Accessibility	0.0%	2.2%	1.0%	7.1%	9.9%
Cost-Effectivness	Cost per Rider	$ 4.58	$ 40.19	$ 342.87	$ 159.50	$ 103.69
	Cost per Transit PMT	$ 0.13	$ 1.89	$ 7.09	$ 5.24	$ 4.74

* Additional Service Above Transforming Rail in Virginia Improvements Included in Baseline

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Summary of Evaluation Results

	Additional Express Bus	BRT Extension	Additional VRE Service*	Metrorail Blue	Metrorail Yellow
Ridership Potential	★★	★★★	★★	★★★	★★★
Congestion Mitigation	★	★★	★	★★★	★★★
Regional Accessibility	★★	★★★	★★	★★★	★★★
Equity	★	★★	★★	★★★	★★★
Cost-Effectiveness	★★★	★★	★	★	★

* Additional Service Above Transforming Rail in Virginia Improvements Included in Baseline

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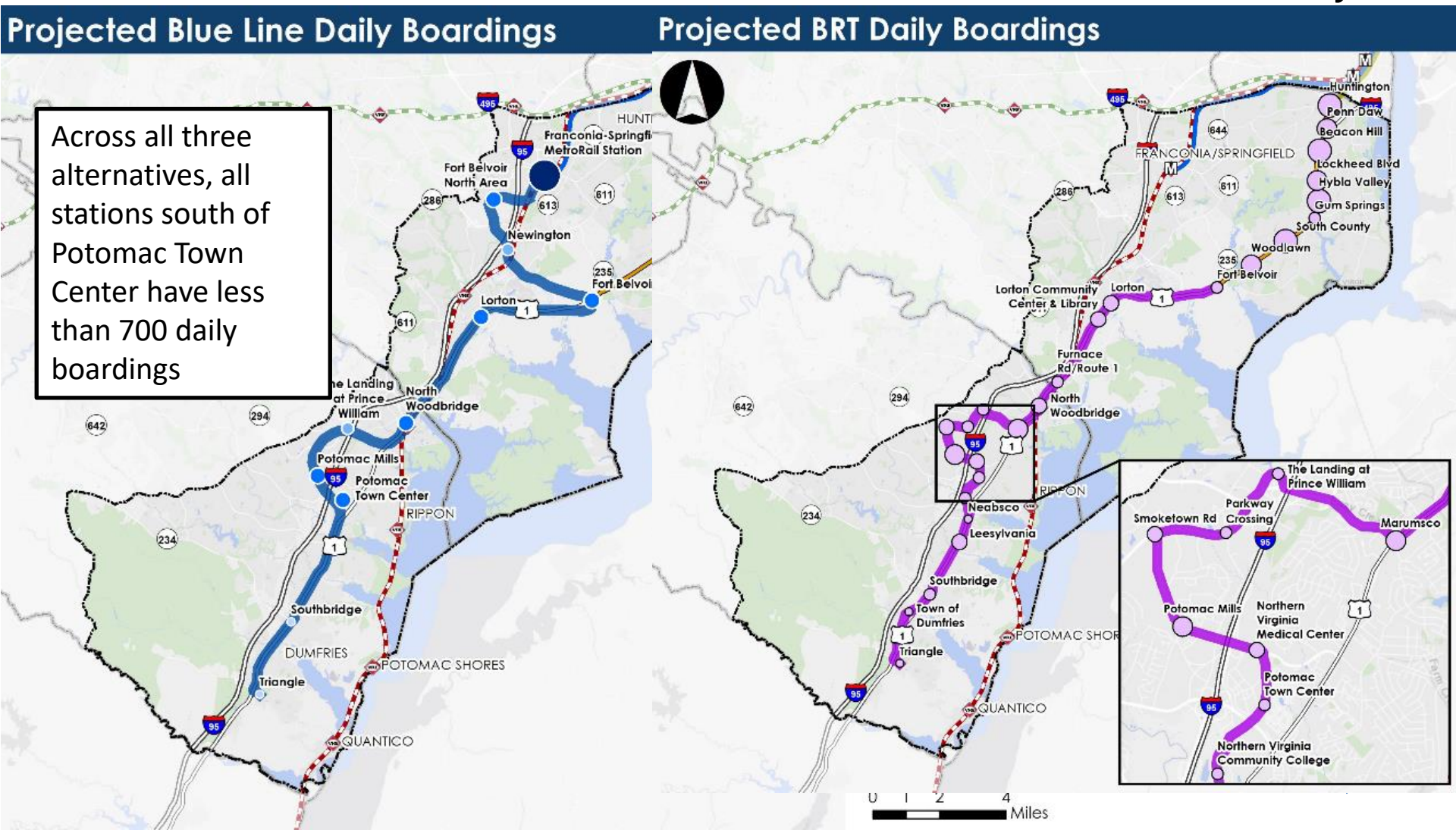
Sensitivity Tests

- Can we make the alternatives more cost efficient by shortening the alignment?
- What might happen to ridership if people keep teleworking?
- How would significant changes in land use change ridership forecasts?

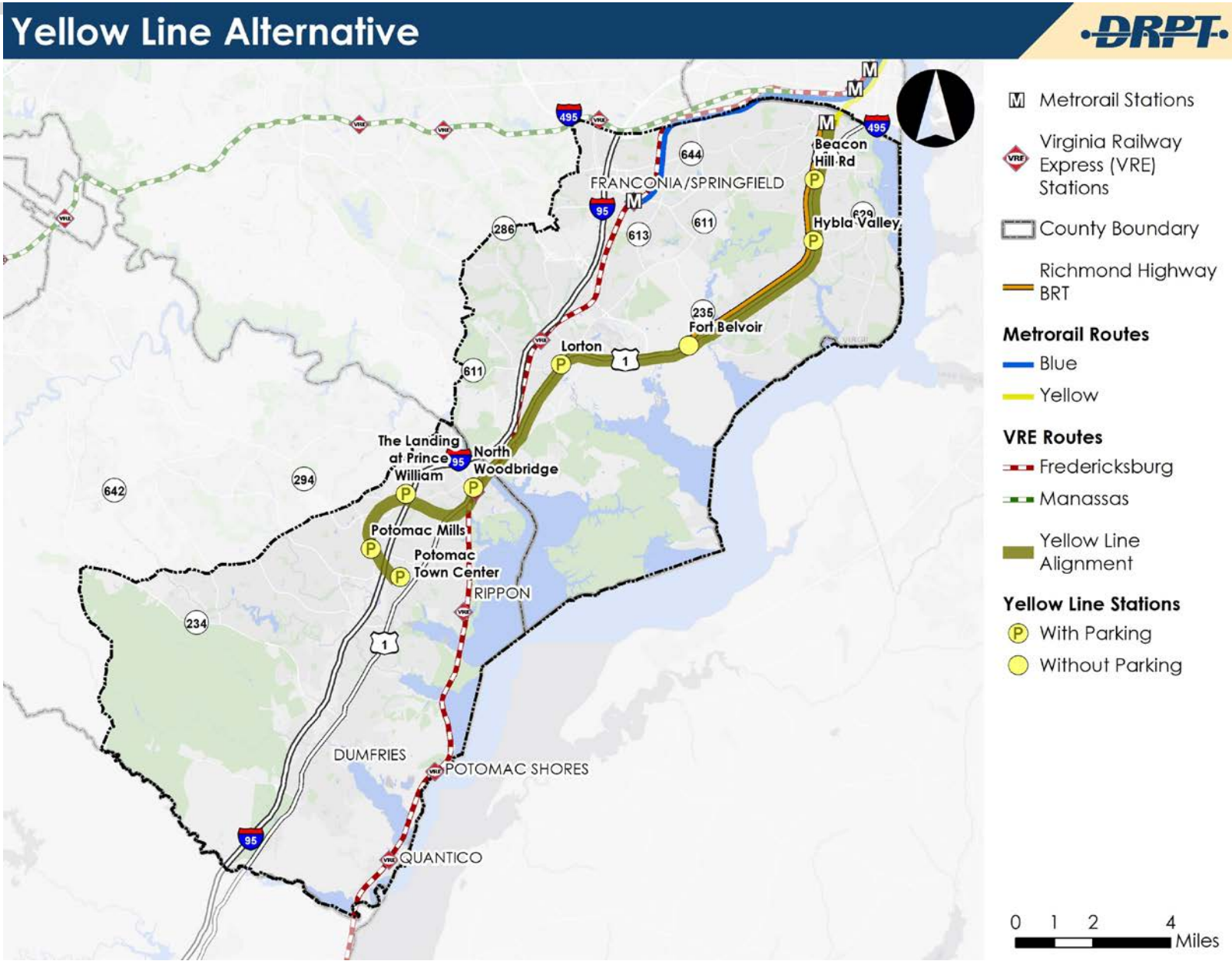
Shorter Alignments

Shorter Alignments

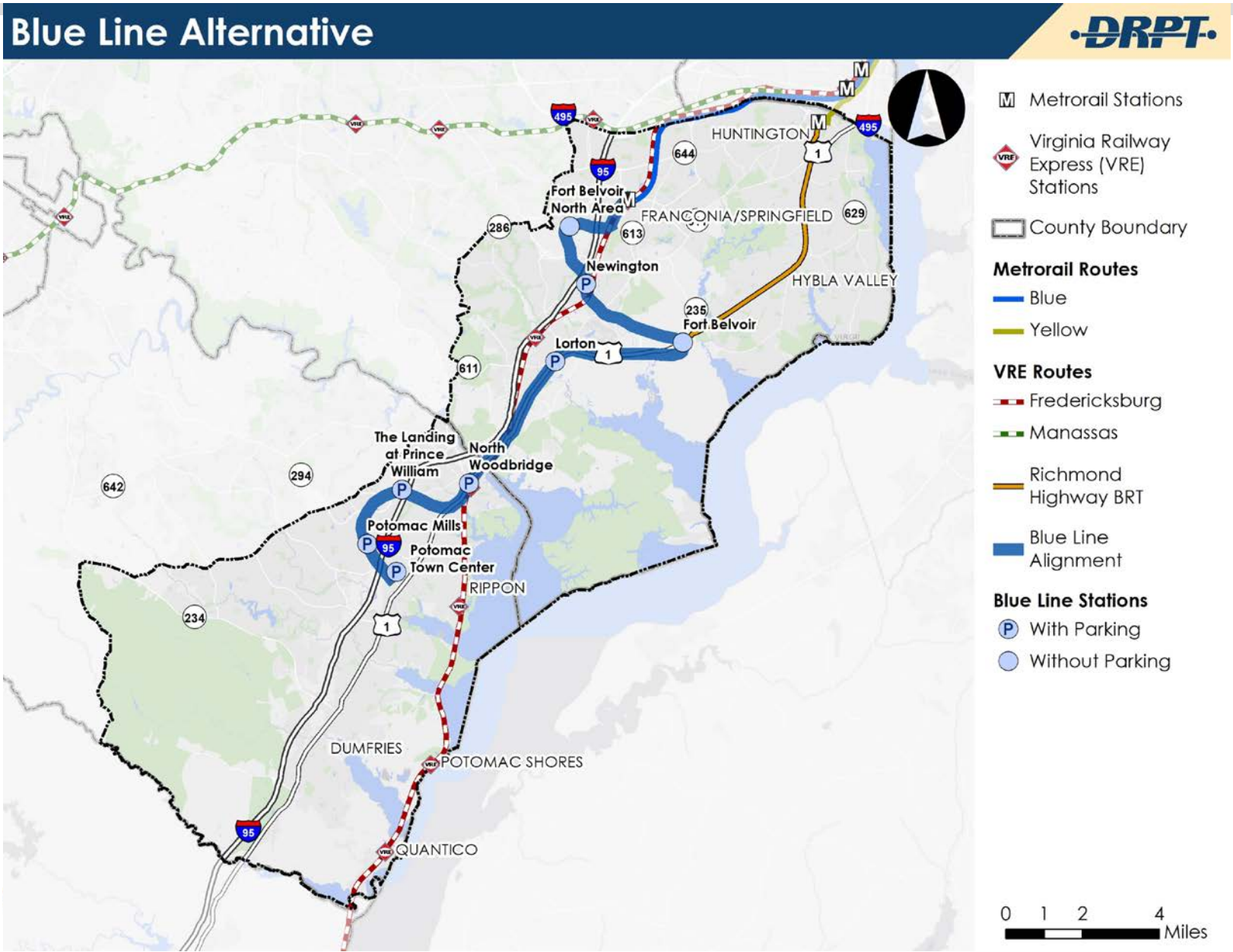
- Remember: Initial model results showed very low ridership for BRT and Metrorail stations south of Potomac Town Center and low cost efficiency



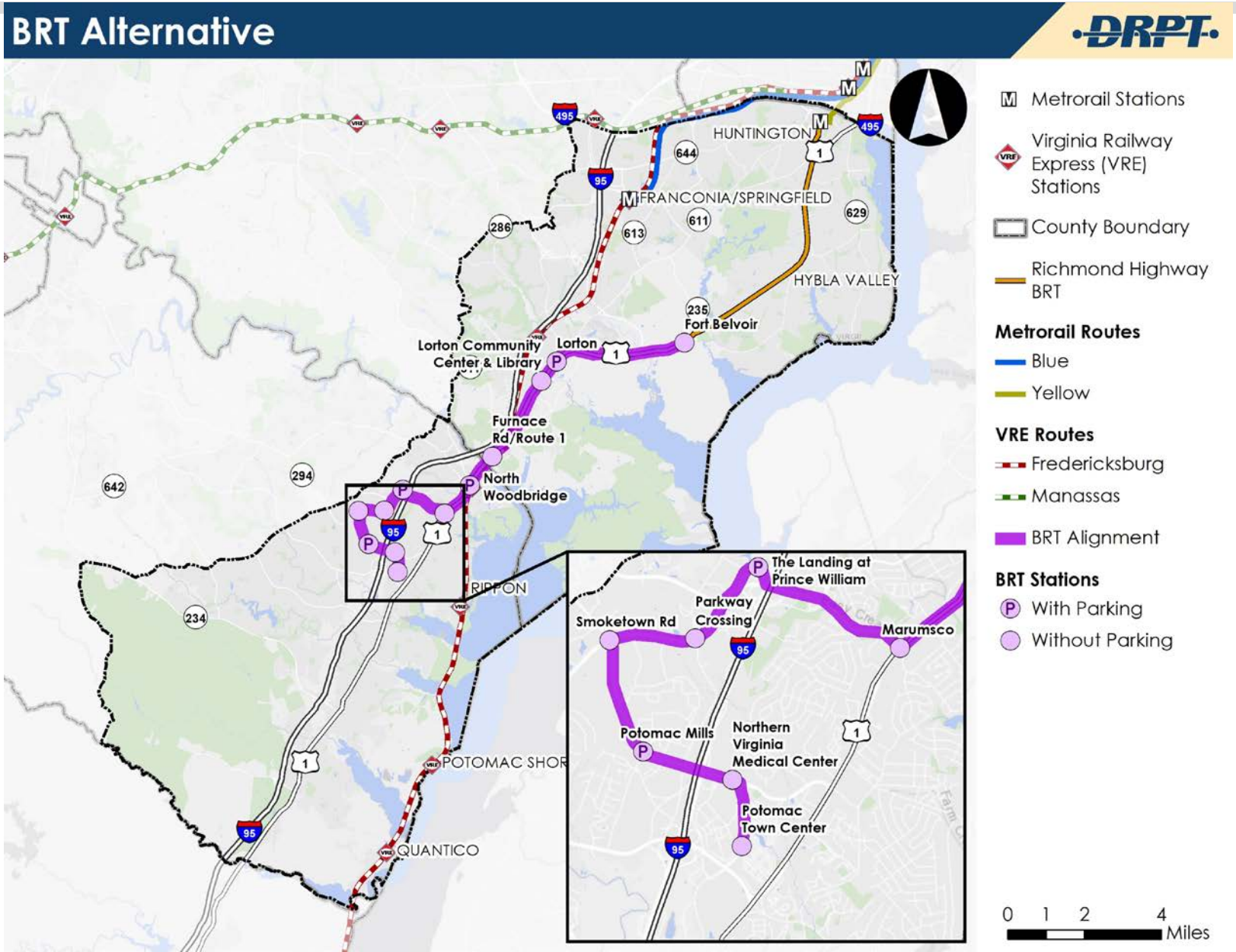
Sensitivity Test: Truncated Yellow Line



Sensitivity Test: Truncated Blue Line



Sensitivity Test: Truncated BRT



Truncated Alignments

Can we make the alternatives more cost efficient by shortening the alignment?

Key Sensitivity Results

Change as compared to Full Alignments

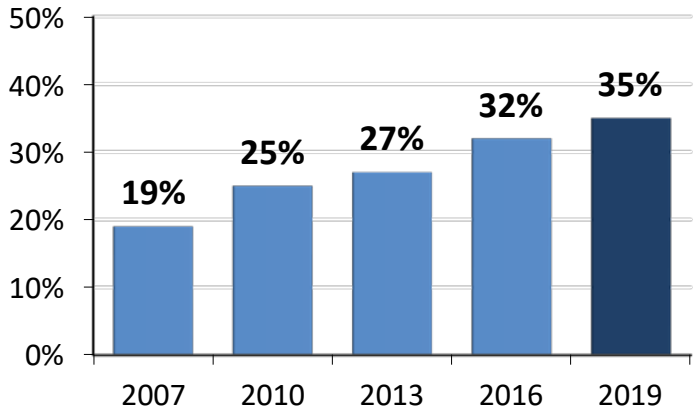
	BRT	Metrorail Blue	Metrorail Yellow
Line Ridership	-3,200 (-14%)	-1,000 (-4%)	-900 (-3%)
Total Corridor Transit Boardings	-3,100 (-4%)	--	--
New Transit Trips in Study Corridor	-1,600 (-32%)	-1,400 (-10%)	-1,300 (-6%)
Cost per Rider	+$0.67 (+2%)	-$27.29 (-16%)	-$20.17 (-18%)

Telework

Telework Assumptions – 2019 Base

2019 Base telework conditions – (MWCOG SOC Survey 2019)

- In 2019, 35% of regional workers teleworked regularly or occasionally vs 19% in 2007
- On a typical day in 2019, roughly 8.6% of regional workers teleworked
- 33% of Fairfax/Prince William workers teleworked 1.1 days/week, a similar frequency to other regional workers



Telework Assumptions – 2045 Potential

- TW increased substantially during the pandemic – estimated that 60-65% of regional workers worked at home, similar to the theoretical potential from the 2019 SOC Survey.
- Regional/national data suggest post-pandemic TW will be higher than pre-pandemic, so 2045 telework likely will fall between the 2019 level and the 60% potential:
- 2045 assumptions lead to nearly three in ten work trips eliminated by TW:
  - Survey data suggest an upper limit of 2 days per week average telework frequency.

Telework Sensitivity Tests

What might happen to ridership if people keep teleworking?

Key Sensitivity Results

Change as compared to Initial Results

	Future Telework Assumption	BRT Alternative Ridership Impact	Metrorail Alternatives Ridership Impact
Low	45% telework an average 1.1 days/wk	-1,900 (-8%)	-5,000 (-12%)
Medium	50% telework an average 1.3 days/wk	-2,800 (-12%)	-7,200 (-18%)
High	55% telework an average 1.5 days/wk	-4,000 (-17%)	-10,600 (-26%)

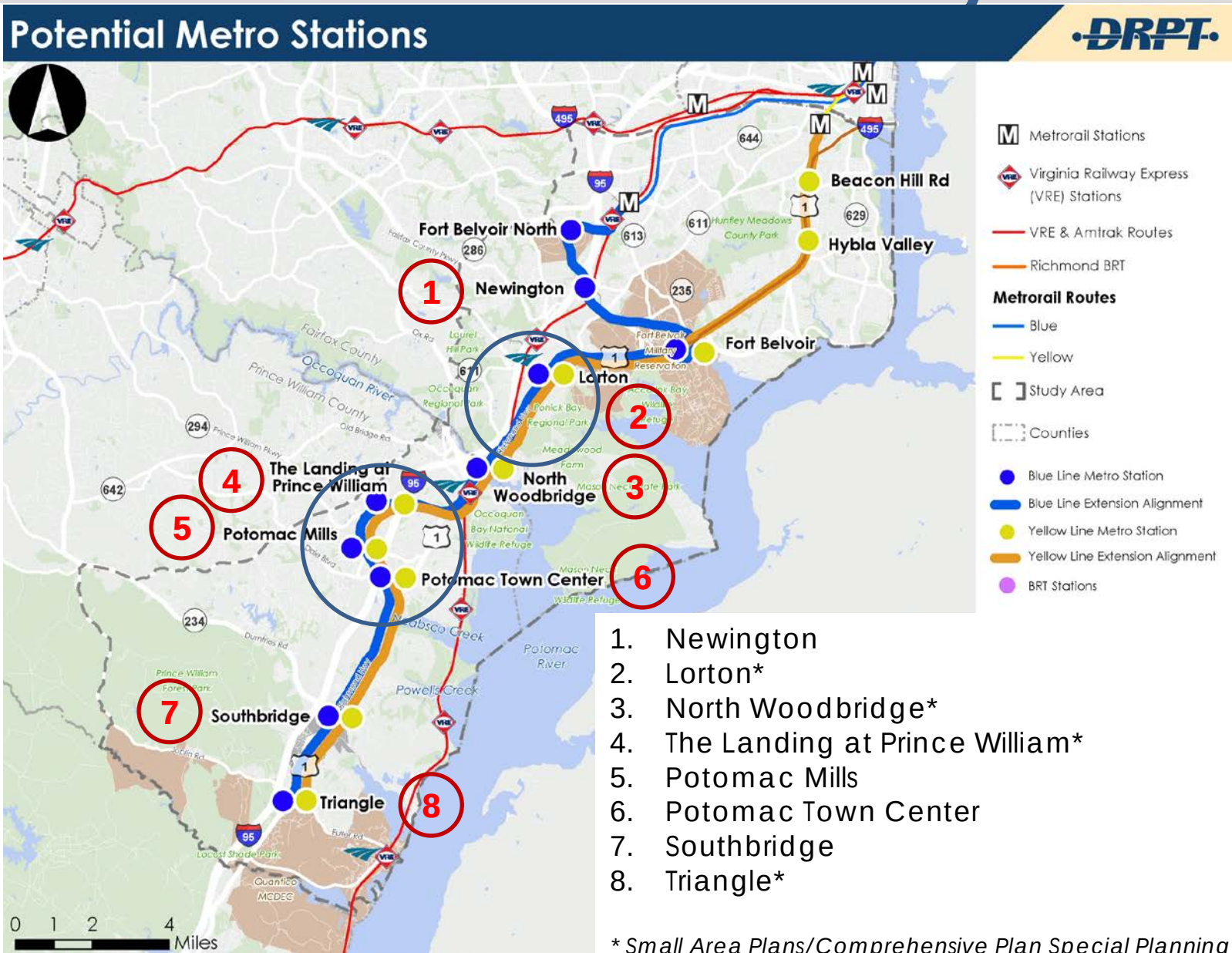
Land Use

Land Use Scenario Assumptions

How would significant changes in land use change ridership forecasts?

- All of our initial model results used MWCOG Cooperative Land Use Forecasts for 2045.
- This sensitivity analysis looked at two different land use scenarios that increased densities around the station areas

Station Areas Considered for Additional Density

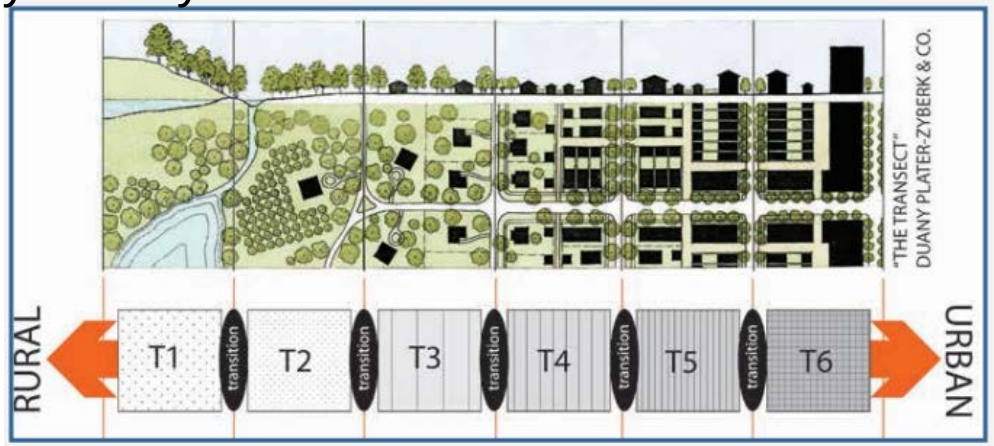


1. Newington
2. Lorton*
3. North Woodbridge*
4. The Landing at Prince William*
5. Potomac Mills
6. Potomac Town Center
7. Southbridge
8. Triangle*

** Small Area Plans/Comprehensive Plan Special Planning Areas*

Density Assumptions and Place Type

For each station area, identified current and planned (MWCOG Forecasts) place types based on activity density



MULTIMODAL CENTER INTENSITY			
Center Type	Activity Density (Jobs + people/acre)	Gross Development FAR (residential + non-residential)	Net Development FAR (residential + non-residential)
P-6 Urban Core	70.0 or more	1.0 or more	1.6 or more
P-5 Urban Center	33.75 to 70.0	0.5 to 1.0	0.8 to 1.6
P-4 Large Town or Suburban Center	13.75 to 33.75	0.21 to 0.5	0.3 to 0.8
P-3 Medium Town or Suburban Center	6.63 to 13.75	0.10 to 0.21	0.15 to 0.3
P-2 Small Town or Suburban Center	2.13 to 6.63	0.03 to 0.10	0.05 to 0.15
P-1 Rural or Village Center	2.13 or less	0.03 or less	0.05 or less
SP Special Purpose Center	Varies	Varies	Varies

Source: DRPT Multimodal System Design Guidelines (2020)

WMATA Ridership Thresholds: Suburban Metrorail

Criteria	Metric	Thresholds		
		Low	Medium	High
Density	Population Density (People per Acre)	< 31.7	31.7 – 47.5	> 47.5
	Employment Density (Jobs per Acre)	< 19	19 – 26	> 26
	Activity Density (People + Jobs)	**< 50.7**	**50.7 – 73.5**	**> 73.5**
Ridership	**Ridership per Mile**	**< 3,500**	**3,500 – 7,000**	**> 7,000**

Source: Transit Corridor Expansion Guidelines (2015)
Ridership per Mile = Total Number of Daily Entries/Number of Miles of Extension

Existing (and Planned) Density at Potential Stations in Study Area

No.	Station	Location	Population Density (1 Mile Radius) (People/Acre)	Employment Density (1 Mile Radius) (People/Acre)	Activity Density (1 Mile Radius) (People + Jobs/Acre)	Place Type
1	Beacon Hill Road**	Fairfax County, VA	10.6	1.8	**12.4**	P4
2	Hybla Valley**	Fairfax County, VA	12.4	2.1	**14.5**	P4
3	Fort Belvoir	Fairfax County, VA	2.4	0.7	**3.1**	P-MB
4	Fort Belvoir North	Fairfax County, VA	4.0	2.4	**6.4**	P-MB
5	Newington	Fairfax County, VA	3.9	5.7	**9.6**	P4
6	Lorton**	Fairfax County, VA	6.8	1.5	**8.3**	P3
7	North Woodbridge**	Prince William County, VA	6.0	1.3	**7.3 (26.7 – 40.0)****	P4
8	The Landing at Prince William**	Prince William County, VA	7.1	2.5	**9.6 (11.0 – 23.0)****	P4
9	Potomac Mills	Prince William County, VA	4.4	5.9	**10.3**	P4
10	Potomac Town Center	Prince William County, VA	6.8	4.0	**10.8**	P3
11	Southbridge	Prince William County, VA	4.2	0.9	**5.1**	P3
12	Triangle**	Prince William County, VA	2.6	0.5	**3.1 (6.7 – 18.0)****	P3

** Higher Density proposed in Small Area Plans

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Land Use Intensity Thresholds

Inputs for Urban Footprints Scenario Modelling

Place Type & Transect Zone Description	Net floor area ratio (FAR)	Gross residential density (du/ac)	Gross population density (pop/ac)	Gross employment density (emp/ac)	Gross Activity Density (pop+emp per ac)	Gross parking density (spcs/1000 sq ft)
T-1 Very low intensity	0.02	0.10	0.22	0.40	0.62	2.24
T-2 Low intensity	0.12	1.18	2.14	1.67	3.81	1.97
T-3 Moderate intensity	0.28	4.69	8.11	4.64	12.75	1.7
T-3.5 Moderate intensity	0.59	12.20	21.01	8.23	29.24	2.07
T-4 Moderate intensity	0.91	17.96	30.92	12.47	43.39	1.67
T-4.5 Moderate-to-high intensity	1.36	32.03	54.55	22.52	77.07	1.78
T-5 High intensity	1.75	42.79	72.88	29.52	102.40	1.66
T-5.5 High intensity	2.21	54.43	92.69	37.04	129.73	1.52
T-6 High intensity	3.15	76.59	129.84	59.98	189.82	1.27

Place type T-4.5 (or higher) achieves the Metro guideline of > 50 activity density.

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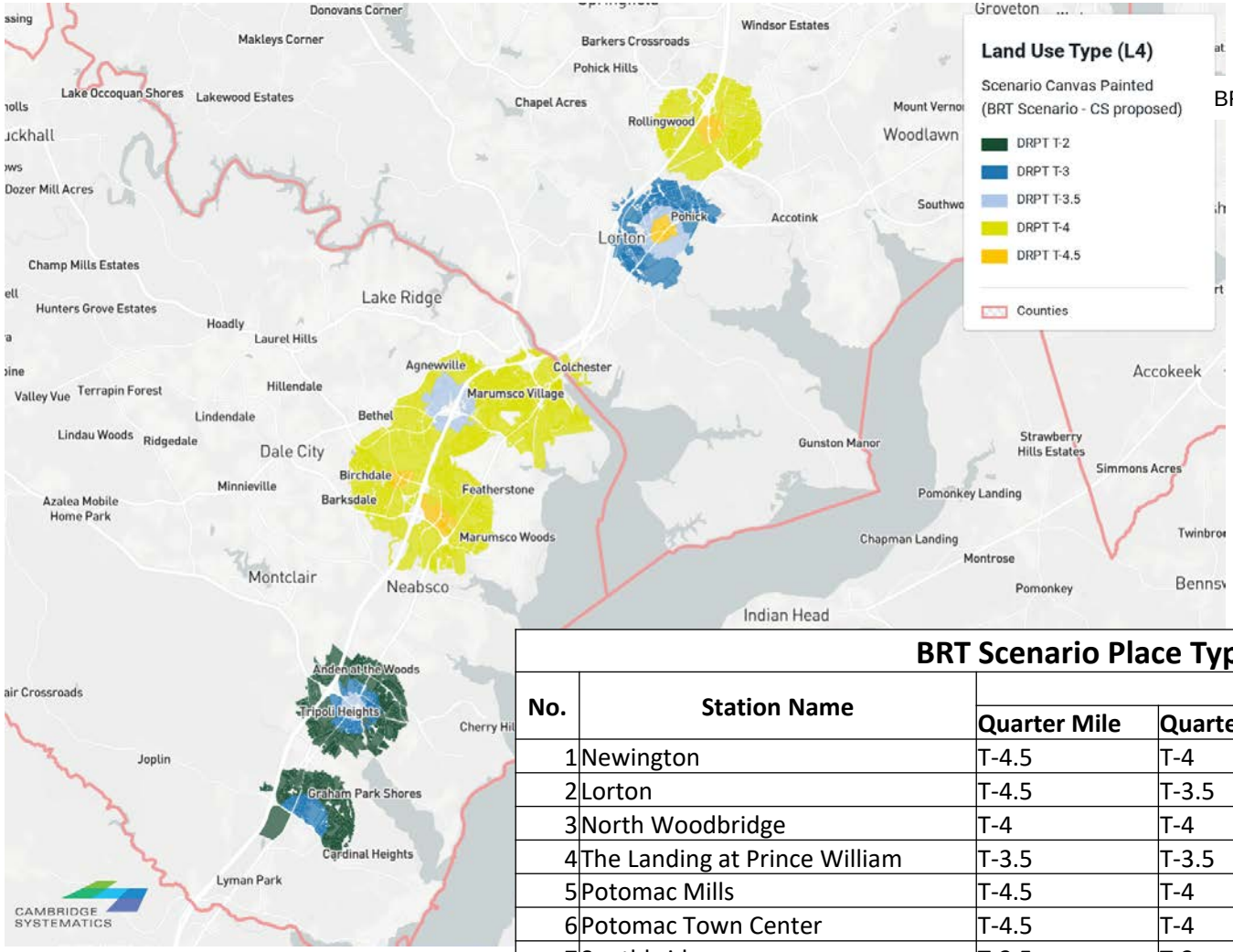
Land Use Assumptions - BRT Scenario



BRT Scenario

BRT Scenario Place Types				
No.	Station Name	Place Type		
		Quarter Mile	Quarter to Half Mile	Half to One Mile
1	Newington	T-4.5	T-4	T-4
2	Lorton	T-4.5	T-3.5	T-3
3	North Woodbridge	T-4	T-4	T-4
4	The Landing at Prince William	T-3.5	T-3.5	T-4
5	Potomac Mills	T-4.5	T-4	T-4
6	Potomac Town Center	T-4.5	T-4	T-4
7	Southbridge	T-3.5	T-3	T-2
8	Triangle	T-3	T-3	T-2

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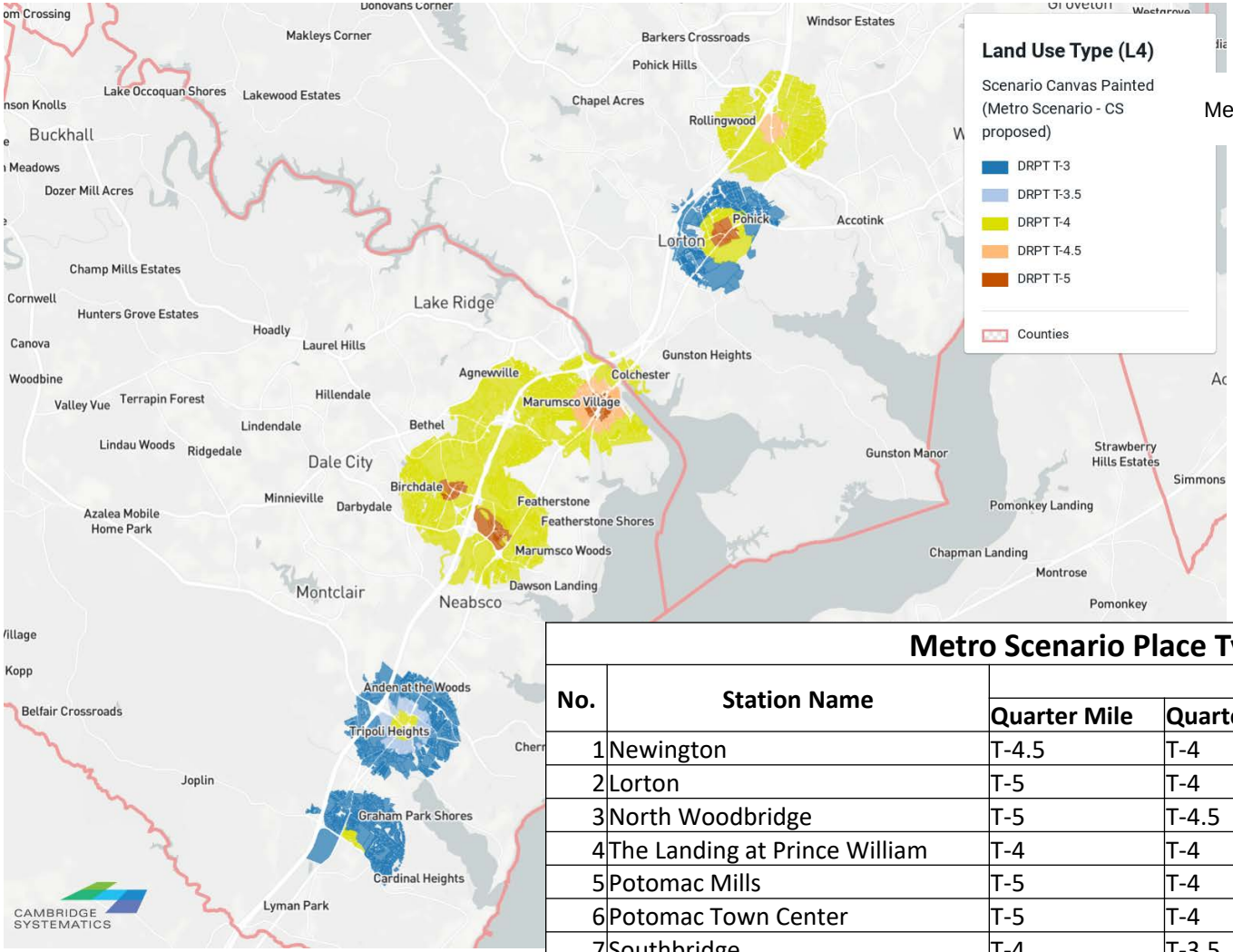
Land Use Assumptions - Metrorail Scenario



Metro Scenario Place Types				
No.	Station Name	Place Type		
		Quarter Mile	Quarter to Half Mile	Half to One Mile
1	Newington	T-4.5	T-4	T-4
2	Lorton	T-5	T-4	T-3
3	North Woodbridge	T-5	T-4.5	T-4
4	The Landing at Prince William	T-4	T-4	T-4
5	Potomac Mills	T-5	T-4	T-4
6	Potomac Town Center	T-5	T-4	T-4
7	Southbridge	T-4	T-3.5	T-3
8	Triangle	T-4	T-3	T-3

Metrorail Scenario by Station

Station Name	2045 Baseline Population	2045 Baseline Jobs	Metrorail Scenario Population	Population Increase	Metrorail Scenario Jobs	Jobs Increase	Metrorail Scenario Activity Density
Newington	12,700	28,600	56,500	344%	26,700	-7%	27.3
Lorton	18,400	6,100	25,200	37%	13,500	123%	7.8
North Woodbridge	28,200	5,700	47,700	69%	18,900	229%	27.6
The Landing at Prince William	26,300	10,00	55,200	110%	22,600	126%	30.3
Potomac Mills	15,400	14,800	43,800	185%	19,800	34%	29.9
Potomac Town Center	27,700	10,600	62,200	124%	23,400	121%	27.4
Southbridge	28,500	6,400	33,400	17%	11,900	86%	11.4
Triangle	11,300	1,300	12,000	6%	5,300	312%	8.2
Yellow Total	155,900	54,900	279,500	79%	115,400	110%	
Blue Total	168,600	83,500	336,000	99%	142,000	70%	

WMATA's threshold for Activity Density is 50.7

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Land Use Impacts on Ridership

How would significant changes in land use change ridership forecasts?

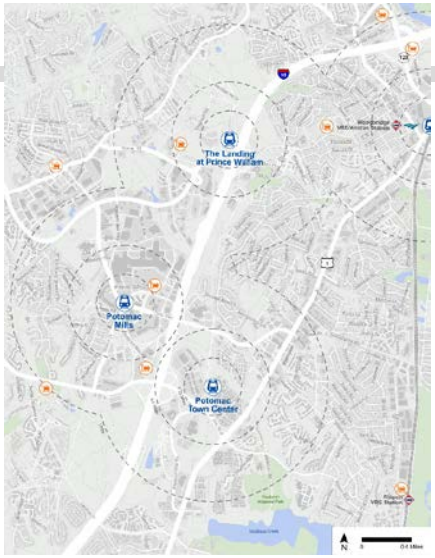
Key Sensitivity Results

Change as compared to Initial Results

	Residents Added to Station Areas	Jobs Added to Station Areas	Ridership Increase
Blue Line Alternative	167,000 (99%)	59,000 (70%)	16,700 (76%)
Yellow Line Alternative	124,000 (79%)	61,000 (110%)	12,600 (38%)
BRT Alternative	134,000 (79%)	45,000 (53%)	7,500 (33%)

Land Use Assessment

Potomac Mills Multimodal District – Analysis



Multimodal District Basemap

Street Network

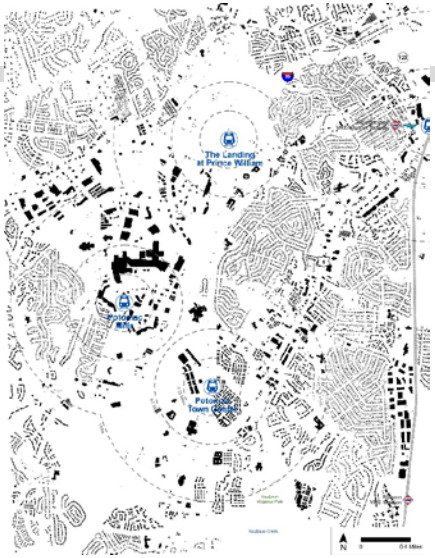
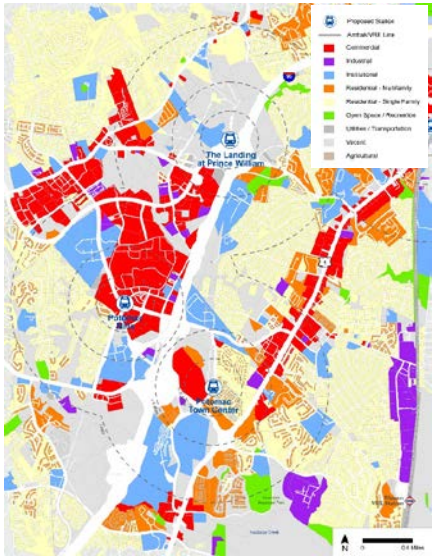
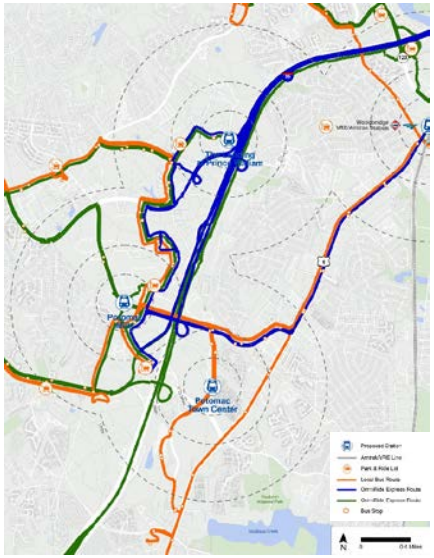


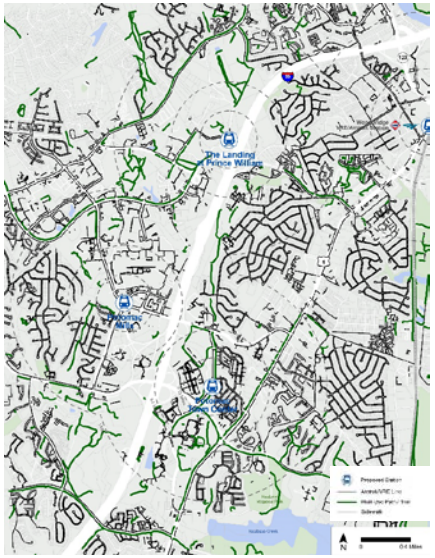
Figure Ground – Building Footprints



Existing Land Use



Existing Transit Network



Existing Ped/Bike Facilities

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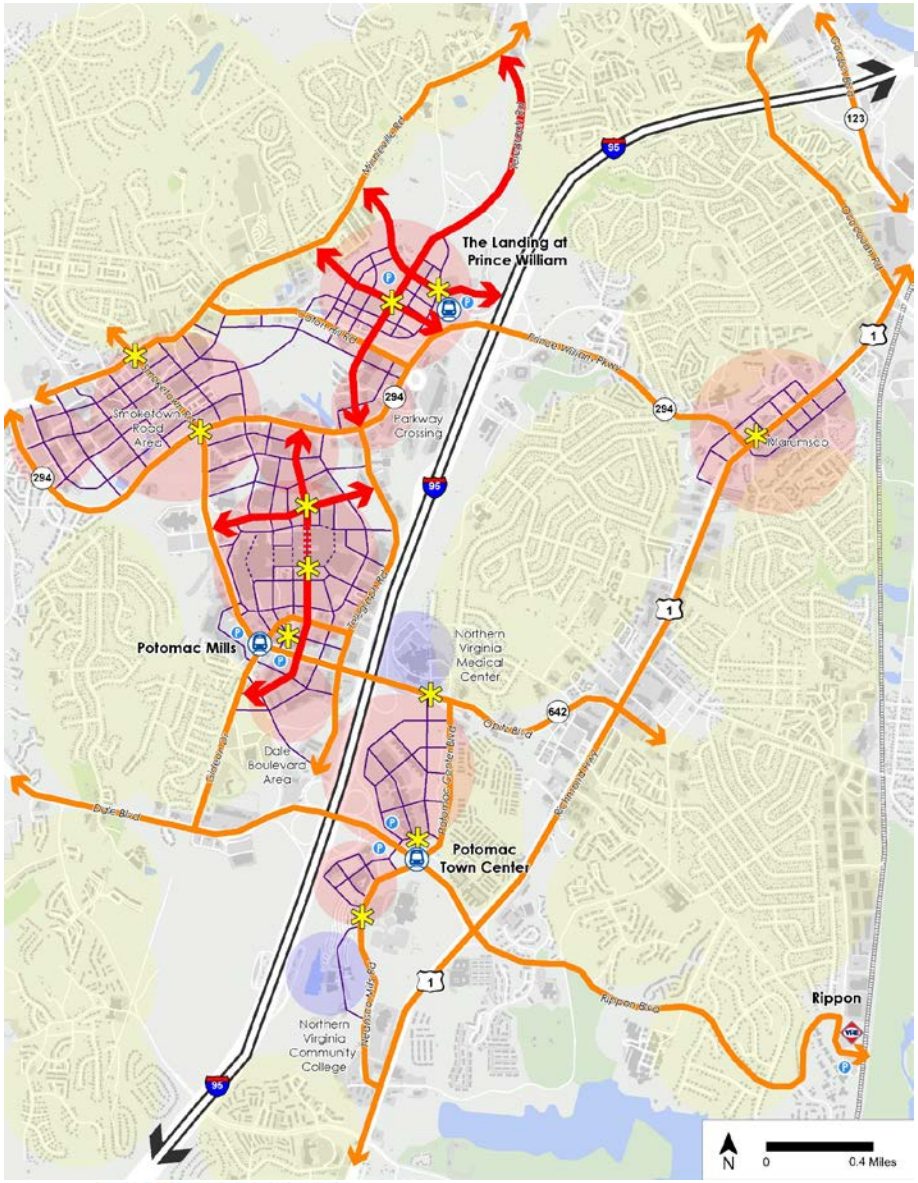
Potomac Mills Multimodal District – TOD Framework



- Potential New Transit Station Location
- Commuter Parking
- Existing VRE Station
- Existing Amtrak Station
- Potential New Public Space Node (Plaza/Gateway/Park)
- Existing Street Envisioned as a Multimodal Corridor (Pedestrian, Bicycle, and Transit Facilities)
- Potential New Street envisioned as a Multimodal Corridor (Pedestrian, Bicycle, and Transit Facilities)
- Potential New Internal Streets
- Activity Center (Mixed Use District)
- Residential Neighborhoods
- Barriers

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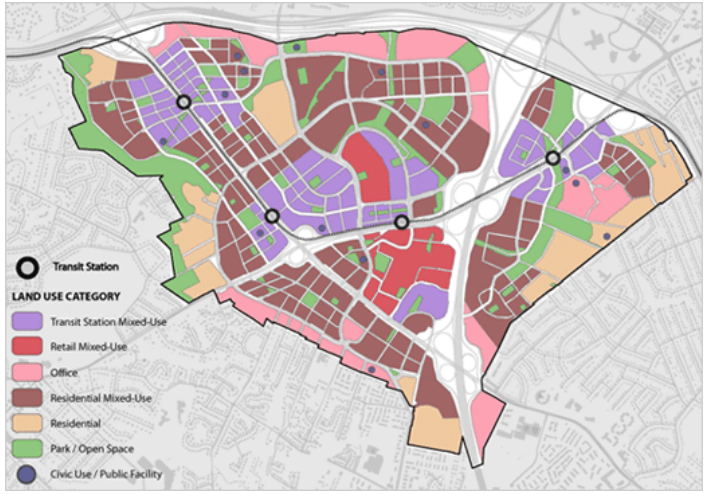
TOD Readiness Best Practices

- Land Use & Zoning
  - TOD supportive zoning + urban design guidelines
  - Design reviews
  - Station Area Plans
- Transportation
  - Arterials as Multimodal Corridors
  - Network of walkable streets with small blocks
  - Ped/Bike Network
  - Feeder Transit/Shuttle Service
  - Micromobility
  - TDM + Shared Parking
- Implementation
  - TOD Rezoning
  - Project implementation through development projects
  - District-wide funding mechanisms
  - Process/Framework for Property Consolidation

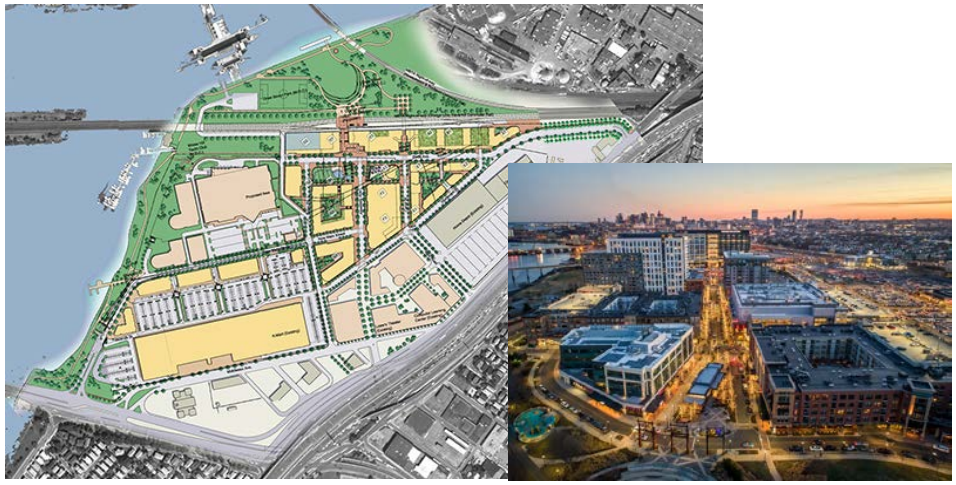
Case Studies



Tysons, Fairfax County, VA

Dunn Loring + Mosaic District, Fairfax County, VA

Pike & Rose and White Flint, Montgomery County, MD



Assembly Square, Sommerville, MA

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Discussion & Meeting Wrap-Up

Schedule for Future TAC Meetings

TAC #	Month	Topics to Be Covered
10	Sept/Oct 2021	• Summary of Transit Alternatives and Land Use Assessment • Draft Study Findings and Recommendations