

TRANSITWAY CORRIDOR FEASIBILITY STUDY



High Capacity Transit Corridor Work Group
March 17, 2011 Meeting

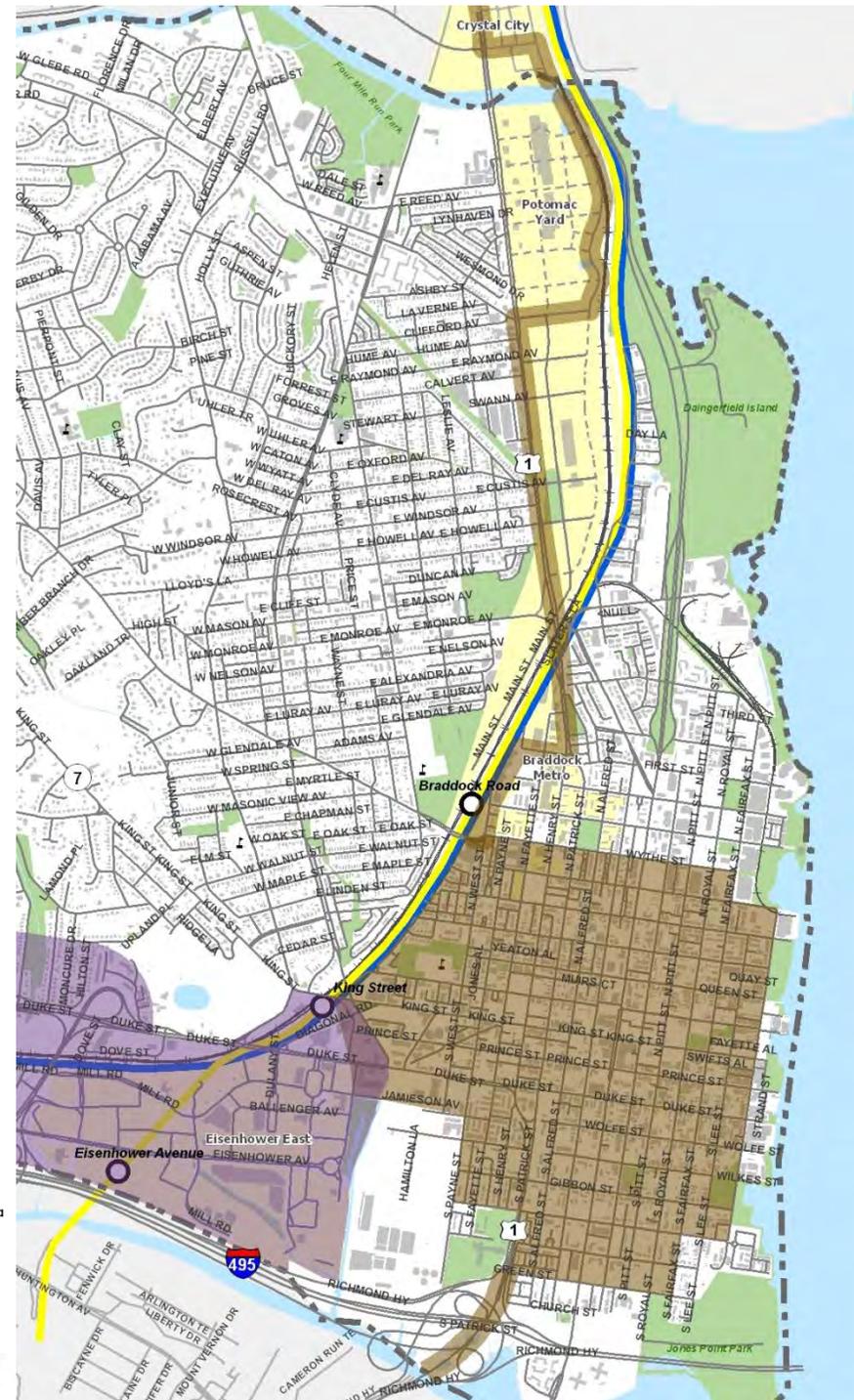
Corridor C Transitway Alternatives Screening



Kimley-Horn
and Associates, Inc.

Corridor A

- Crystal City/Potomac Yard Transitway between Braddock Road Metrorail Station and Pentagon/Pentagon City Metrorail Stations
- Major destinations
 - Old Town
 - Potomac Yard
 - Pentagon
 - Crystal City
 - King Street and Braddock Road Metro
- Specific alignment south of Braddock Road Metro to be determined



Legend	
Jurisdiction Boundary	Body of Water
Street	Park
Railroad	Opportunity Area
MetroRail	
Blue Line	
Yellow Line	
Station	
Future Transitway	
Corridor A	Corridor C
Corridor B	



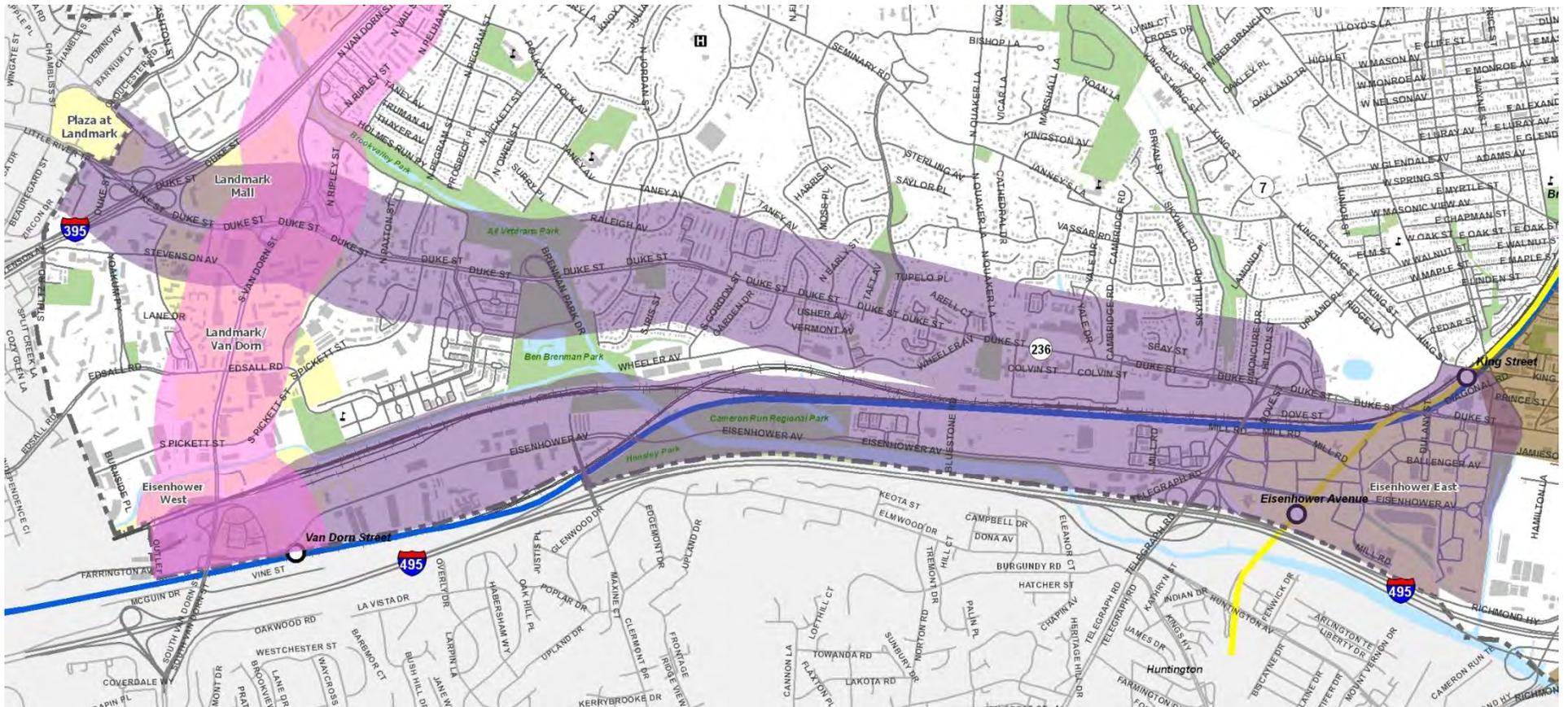


Corridor B

- Connects King Street Metrorail Station area to Fairfax County
- Major destinations
 - Carlyle
 - Landmark Mall/Van Dorn
 - Cameron Station
 - Old Town
 - King Street Metro
 - Eisenhower Avenue Metro

Legend

- Jurisdiction Boundary
- Street
- Railroad
- MetroRail
 - Blue Line
 - Yellow Line
- Station
- Body of Water
- Park
- Opportunity Area
- Future Transitway
 - Corridor A
 - Corridor C
 - Corridor B



Corridor C Preliminary Screening

- **Transit Modes**
 - Rapid bus
 - Bus Rapid Transit (BRT)
 - Streetcar in mixed flow
 - Streetcar in dedicated lanes
- **Corridor Connections**
 - Columbia Pike
 - Shirlington
 - Pentagon/Pentagon City
 - Van Dorn Metrorail Station
- **Alignment Options**
 - Mark Center/Southern Towers
 - Sanger/Landmark Plaza & Duke Street
 - Multimodal bridge to Van Dorn Metrorail station



Preliminary Alternatives

Alternative A



Streetcar

- Mixed Flow
- Connecting to Columbia Pike

Alternative B



Rapid Bus

- Mixed Flow
- Connecting to Pentagon and Shirlington

Alternative C



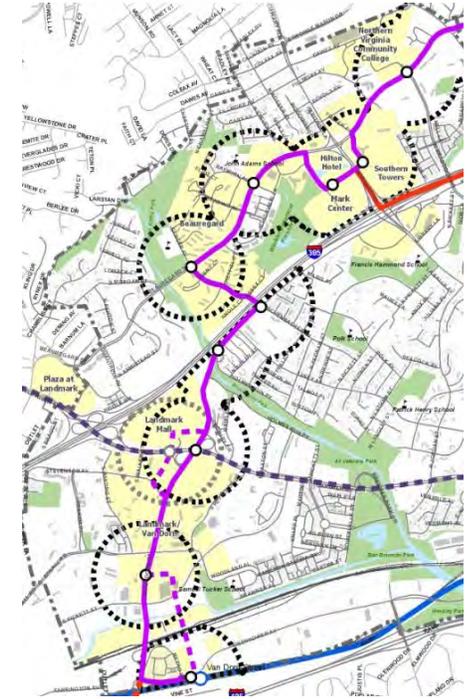
Rapid Bus

- Mixed Flow
- Connecting to Pentagon

Streetcar

- Mixed Flow
- Connecting to Beaugard Town Center

Alternative D



Bus Rapid Transit

- Dedicated Lanes
- Connecting to Pentagon and Shirlington

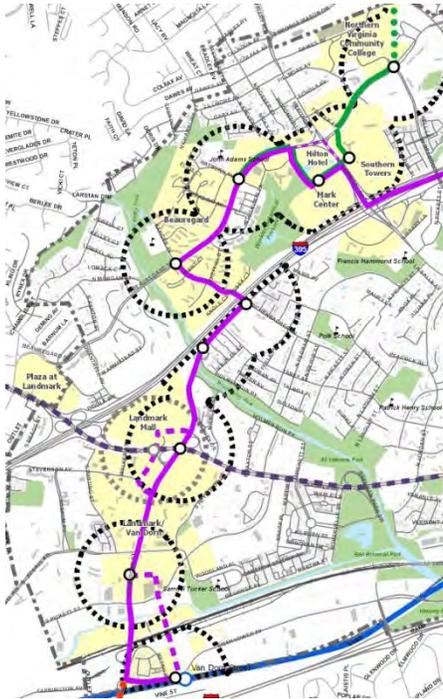
Legend

	Rapid Bus		Phased Route
	Streetcar - Mixed Flow		Optional Route or Columbia Pike Connection
	BRT (Bus Rapid Transit)		Transitway Station
	Streetcar (dedicated lanes)		Quarter-mile station area



Preliminary Alternatives

Alternative E



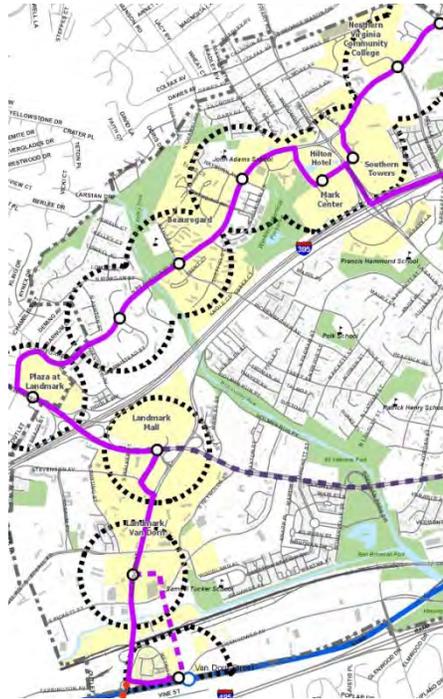
Bus Rapid Transit

- Dedicated Lanes
- Connecting to Pentagon

Streetcar

- Mixed Flow
- Connecting to Beauregard Town Center

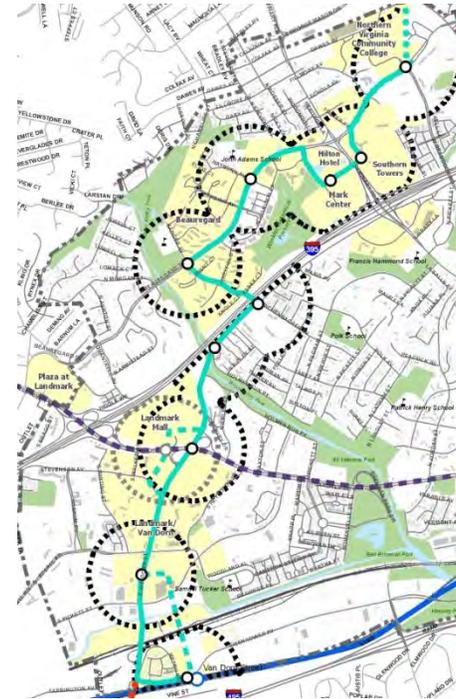
Alternative F



Bus Rapid Transit

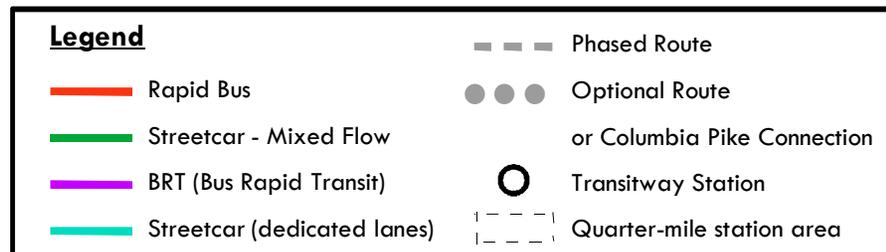
- Dedicated Lanes
- Connecting to Pentagon and Shirlington via the Plaza at Landmark

Alternative G



Streetcar

- Dedicated Lanes
- Connecting to Columbia Pike



Preliminary Screening Criteria

Preliminary Screening Criteria	Description
Service to Regional Destinations	Key destinations served
Service to Population, Employment, and Retail in the Corridor	Population, employment, retail, and key destinations served
Transit Connectivity	Access to other transit services (existing and planned)
Transit Travel Time	Relative speed of transit along the Van Dorn/Beauregard corridor
Alignment Quality	Geometric quality of alignment
Property Impacts	Number, use type, and quantity of properties impacted with anticipated level of impact (ROW only, partial take, total take)
Traffic Flow Impact	Effect of transit implementation on general vehicle flow (non-transit) in corridor
Capital Cost	Comparative capital cost for initial system construction

Preliminary Evaluation Summary

Preliminary Screening Criteria	Alternative						
	A	B	C	D	E	F	G
Transit Mode:	Streetcar (mixed)	Rapid Bus (mixed)	Streetcar (mixed) & Rapid Bus (mixed)	BRT (mixed & dedicated)	Streetcar (mixed) & BRT (mixed & dedicated)	BRT (mixed & dedicated)	Streetcar (dedicated)
Northern Connection:	Columbia Pike	Shirlington & Pentagon	Columbia Pike & Pentagon	Shirlington & Pentagon	Columbia Pike & Pentagon	Shirlington & Pentagon	Columbia Pike
Service to Regional Destinations							
Service to Population, Employment, & Retail in the Corridor							
Transit Connectivity							
Transit Travel Times							
Alignment Quality							
Property Impacts							
Traffic Flow Impact							
Capital Cost							
Preliminary Cost Estimate* <small>(capital cost, based on modal cost per-mile within the City)</small>	\$90M	\$15M	\$40M	\$50M	\$65M	\$55M	\$180M

Rating:		Best		Fair		Poor
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*Preliminary cost estimates are shown in year 2010 dollars and do not include additional contingency or escalation to a future year mid-point of construction. Totals listed do not include costs for initial (or programmed replacement) vehicle purchases, maintenance facilities, right-of-way acquisition (including any condemnation, damages, or relocation costs), major utility relocations/new service, or roadway/streetscape improvements that may be implemented concurrently, but are not required for the transit project. Alignments designated as "optional" are not included in the cost.

Summary of CWG and Public Comments

CWG Members

- Some preference for Alternative B due to its low initial cost and shorter time period for implementation
- More capital-intensive alternatives were preferred due to their ability to operate more efficiently and to tie to the regional streetcar network
- Connectivity to the Pentagon and Shirlington were identified as important

Public Comments

- Need for a multi-phased approach to implementing the transitway
- Start out with something smaller, not high capacity transit
- Need something that is permanent, like streetcars, that will attract visitors and development
- Need dedicated lanes for system effectiveness
- Need to know ridership before dismissing streetcars
- Sanger Avenue cannot handle a transitway – already constrained and potential environmental impacts to Holmes Run
- Question as to the value of serving the Pentagon
- Need to serve local residents first, then regional
- Provide connectivity to local activity centers in Alexandria, Arlington, and Fairfax



Preliminary Alternatives Selected for Further Evaluation

Alternative B



- Possible preliminary phase of any other alternative
- Baseline for evaluation

Alternative D



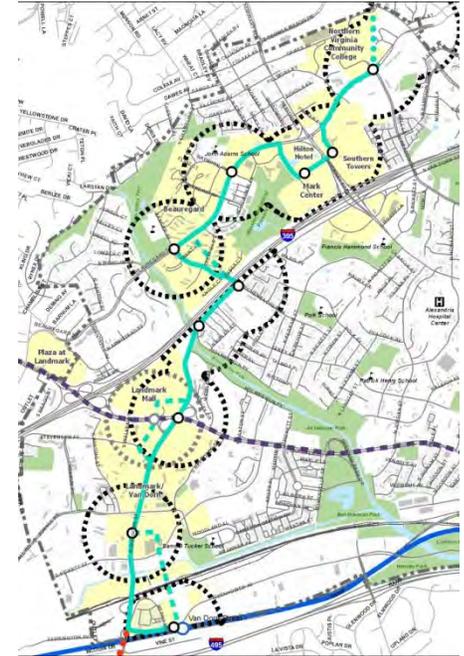
- Support from CWG
- BRT
- Shirlington connection
- Moderate capital cost

Alternative E



- Support from CWG
- BRT and streetcar
- Single seat ride between Columbia Pike and potential Beauregard Town Center
- Moderate-high capital cost

Alternative G



- Public support
- Streetcar option
- Compatibility with Columbia Pike
- High capital cost

Legend	
	Rapid Bus
	Streetcar - Mixed Flow
	BRT (Bus Rapid Transit)
	Streetcar (dedicated lanes)
	Phased Route
	Optional Route
	Transitway Station
	Quarter-mile station area
	or Columbia Pike Connection



BASELINE ALTERNATIVE



TIGER Grant-Funded Van Dorn/Beauregard Transit Improvements Project

Transit Signal Priority Locations

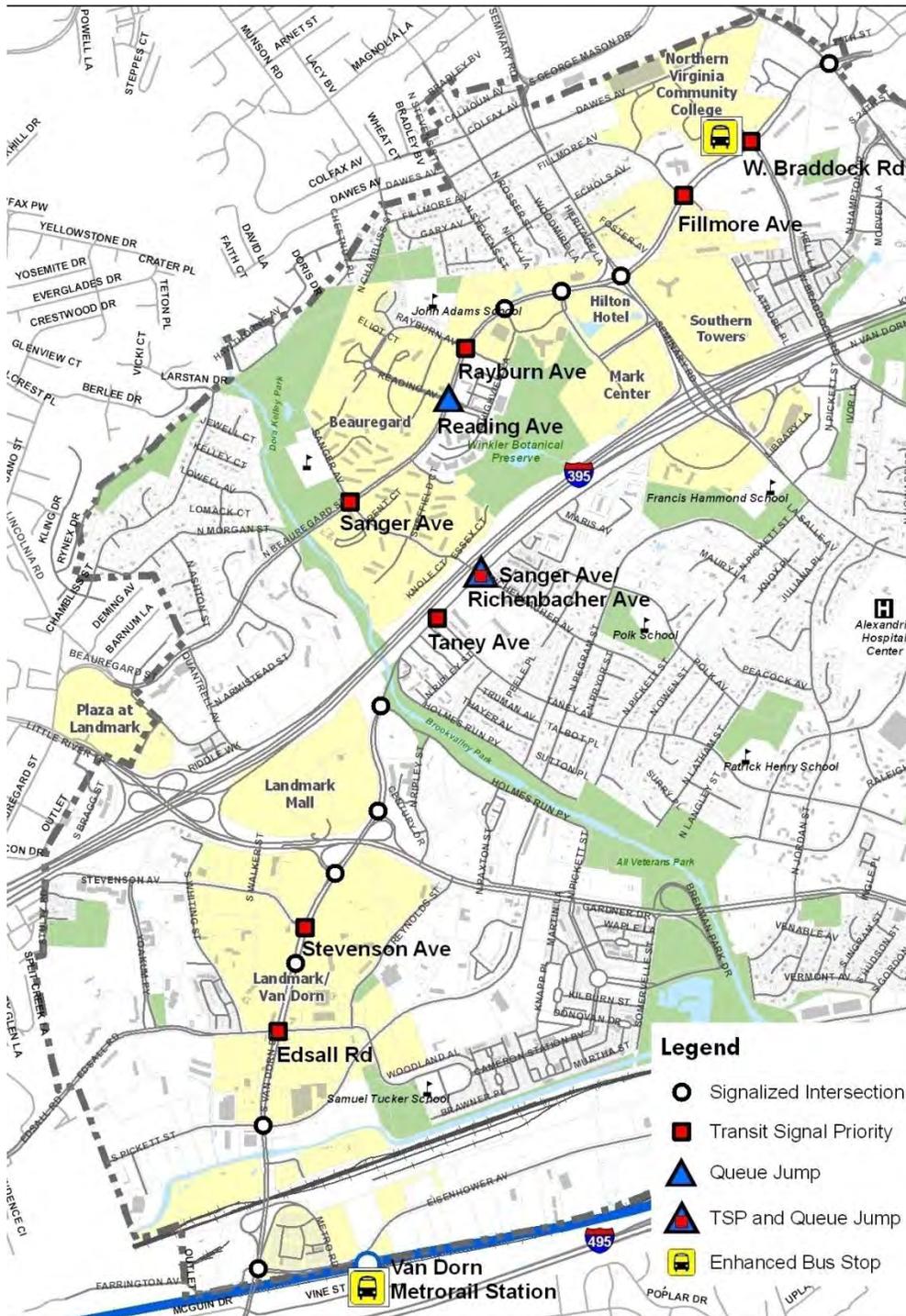
1. Beauregard St at W. Braddock Rd
2. Beauregard St at Fillmore Ave
3. Beauregard St at Rayburn Ave
4. Beauregard St at Sanger Ave
5. S. Van Dorn St at Sanger Ave
6. S. Van Dorn St at Taney Ave
7. S. Van Dorn St at Stevenson Ave
8. S. Van Dorn St at Edsall Rd

Queue Jump Locations

1. Beauregard St at Reading Ave
2. N. Van Dorn St at Sanger Ave/
Richenbacher Ave

Enhanced Bus Stop Locations

1. Beauregard St at W. Braddock Rd
2. Van Dorn Metrorail station



Transit Signal Priority and Queue Jump Lanes

- Transit Signal Priority
 - If the signal is green, but about to turn red – adds few seconds of green time for approaching transit
 - If the signal is red – reduces the length of the red phase for approaching transit
- Queue Jump Lanes
 - Allow bus to bypass some traffic
 - Combination of signal phasing and a lane to improve transit performance

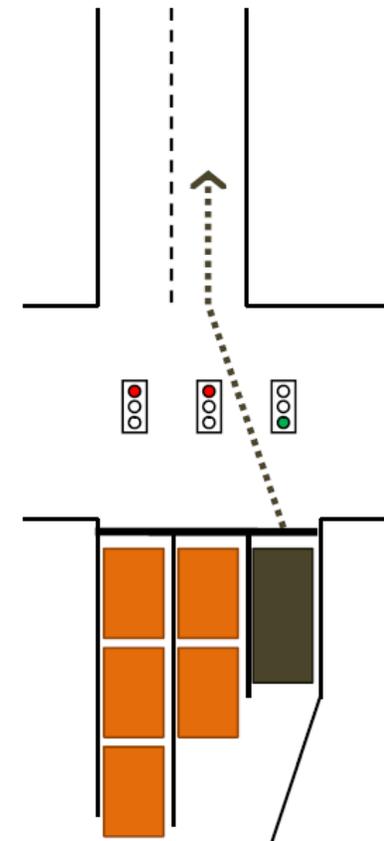


Illustration of queue jump through advance green for transit vehicle



Enhanced Bus Stops

- Provide transit information
- Safety of passengers



EVALUATION OF ALTERNATIVES D, E, AND G



Evaluation Criteria

General Evaluation Criteria Grouping	Criteria Sub-Group	Evaluation Criteria	For Use in Preliminary Screening of Concepts	For Use in Comparative Evaluation of Concepts	Measurement Method
Effectiveness - Addresses stated transportation issues in the corridor	Coverage	Service to Population, Employment, and Other Destinations	✓	✓	Tabulate population, employment, key destinations, and similar, served by option
		Transit Connectivity	✓	✓	Access to other transit services (existing and planned)
	Operations	Running-way Configuration(s)		✓	Quantify amount of runningway that is dedicated and amount that is mixed flow
		Corridor Length		✓	Measured length of the corridor (mi or feet)
		Capacity		✓	Potential corridor capacity (hourly) based on mode technology, headways, and other conditions
		Interoperability		✓	Identification of whether the chosen runningway configuration and transit mode technology are compatible with regionally planned systems
		Avoidance of Congestion		✓	Number and locations of LOS E/F intersections avoided
		Transit Travel Time	✓	✓	Transit travel time
		Intersection Priority		✓	Percent of intersections where TSP is needed and can be implemented successfully - notation of where it cannot be implemented successfully
	Alignment	Ridership		✓	Forecast number of riders
		Geometrics	✓	✓	Geometric quality of alignment
	Phasing	Runningway Status		✓	Percent of corridor to be located on new or realigned roadway
Phasing			✓	Identification of ability to phase operations and implementation	
Impacts - Extent to which economics, environment, community, transportation are affected	Economic	Development Incentive		✓	Perceived value of transit mode technologies with regard to development potential
	Natural Environmental	Natural Environment		✓	Summary of key environmental conditions affected (wetlands, floodplains, T&E, streams, and similar)
		Parks and Open Space		✓	Summary of parks and/or open spaces affected
	Neighborhood and Community	Property	✓	✓	Number, use type, and quantity of properties impacted with anticipated level of impact (ROW only, partial take, total take)
		Streetscapes		✓	Impact to existing streetscapes
		Community Resources		✓	Identify number and location of historical, cultural, community, archaeological resources affected
		Demographics		✓	Identification of impacts to special populations
	Transportation	Noise and Vibration		✓	Summarize relative noise and vibration impacts of different mode types and corridor configurations
		Traffic Flow Impact	✓	✓	Effect of transit implementation on vehicular capacity of corridor
		Traffic Signals		✓	Number of existing signalized intersections affected by transit, identification of need for new signal phases, and number/location of new traffic signals needed to accommodate transit
Multimodal Accommodation			✓	Impacts to, and ability to accommodate bicycles and pedestrians	
	Parking		✓	Impacts to parking	
Cost Effectiveness - Extent to which the costs are commensurate with their benefits	Cost	Capital cost	✓	✓	Order of magnitude capital cost for corridor (stations, runningway, etc.)
		Operating cost		✓	Order of magnitude operating cost
		Cost Per Rider		✓	Order of magnitude operating cost per rider
Financial Feasibility - Cost of system/concept is in alignment with available funding	Funding	Funding		✓	Availability to specific funding sources
		Private Capital Incentive		✓	Judgment as to whether the concept has the potential to attract private capital investment and innovative procurement

Secondary Evaluation Criteria – Effectiveness

Criteria Sub-Group	Evaluation Criteria	Measurement Method
Coverage	Service to Population, Employment, and Other Destinations	Tabulate population, employment, key destinations, and similar, served by option
	Transit Connectivity	Access to other transit services (existing and planned)
Operations	Running-way Configuration(s)	Quantify amount of runningway that is dedicated and amount that is mixed flow
	Corridor Length	Measured length of the corridor (mi or feet)
	Capacity	Potential corridor capacity (hourly) based on mode technology, headways, and other conditions
	Interoperability	Identification of whether the chosen runningway configuration and transit mode technology are compatible with regionally planned systems
	Avoidance of Congestion	Number and locations of LOS E/F intersections avoided
	Transit Travel Time	Transit travel time
	Intersection Priority	Percent of intersections where TSP is needed and can be implemented successfully - notation of where it cannot be implemented successfully
	Ridership	Forecast number of riders
Alignment	Geometrics	Geometric quality of alignment
	Runningway Status	Percent of corridor to be located on new or realigned roadway
Phasing	Phasing	Identification of ability to phase operations and implementation

Typical Vehicle Capacity

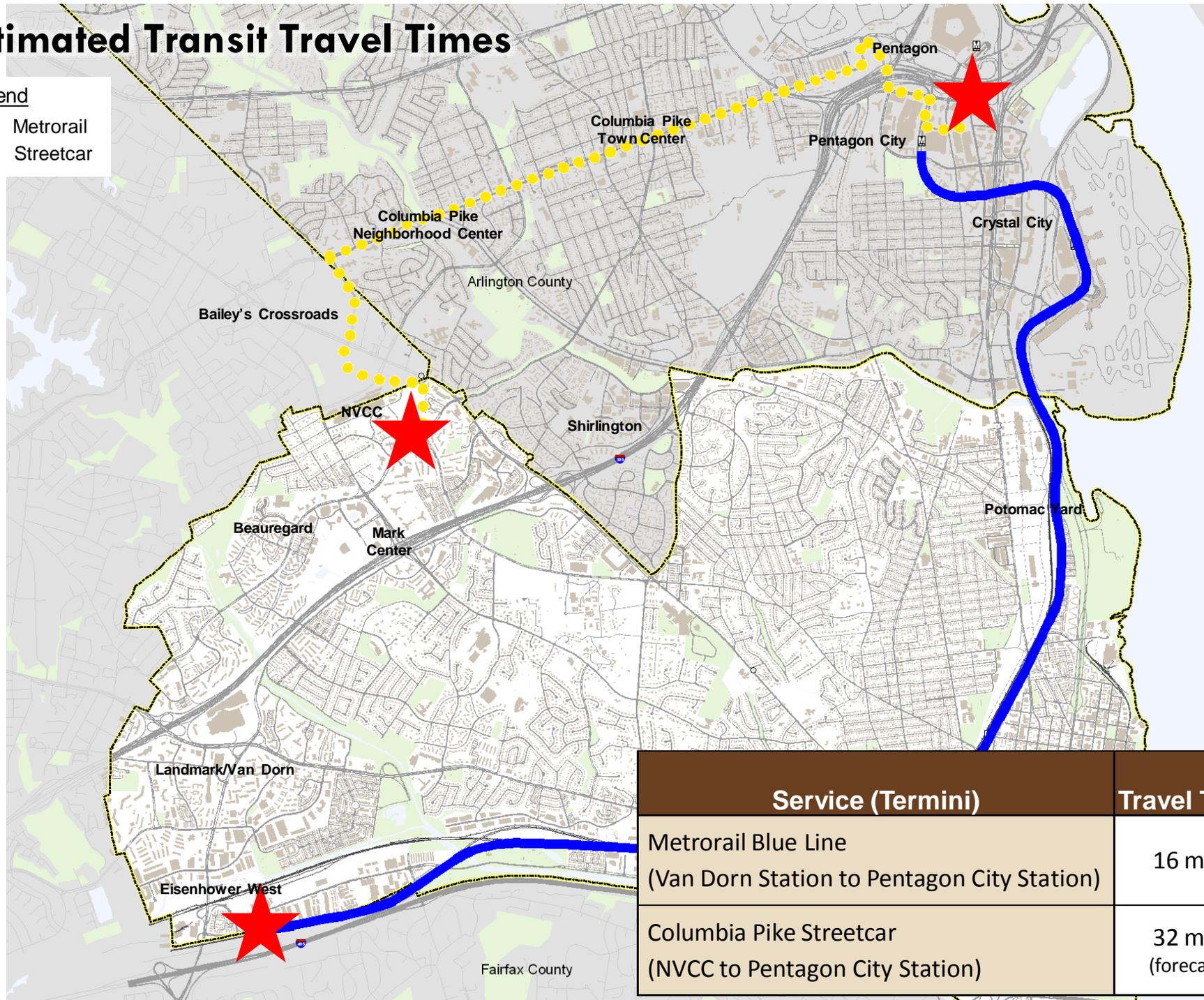
Vehicle	Seated Capacity	Standing Capacity	Total Capacity
BRT Vehicle	30 to 60 passengers	30 to 60 passengers	80 to 90 passengers
Streetcar Vehicle	approximately 30 passengers	110 to 140 passengers	140 to 170 passengers

- BRT vehicles typically seat more people than streetcars
- Streetcar vehicles have a higher overall capacity than BRT vehicles

Estimated Transit Travel Times

Legend

- Metrorail
- Streetcar

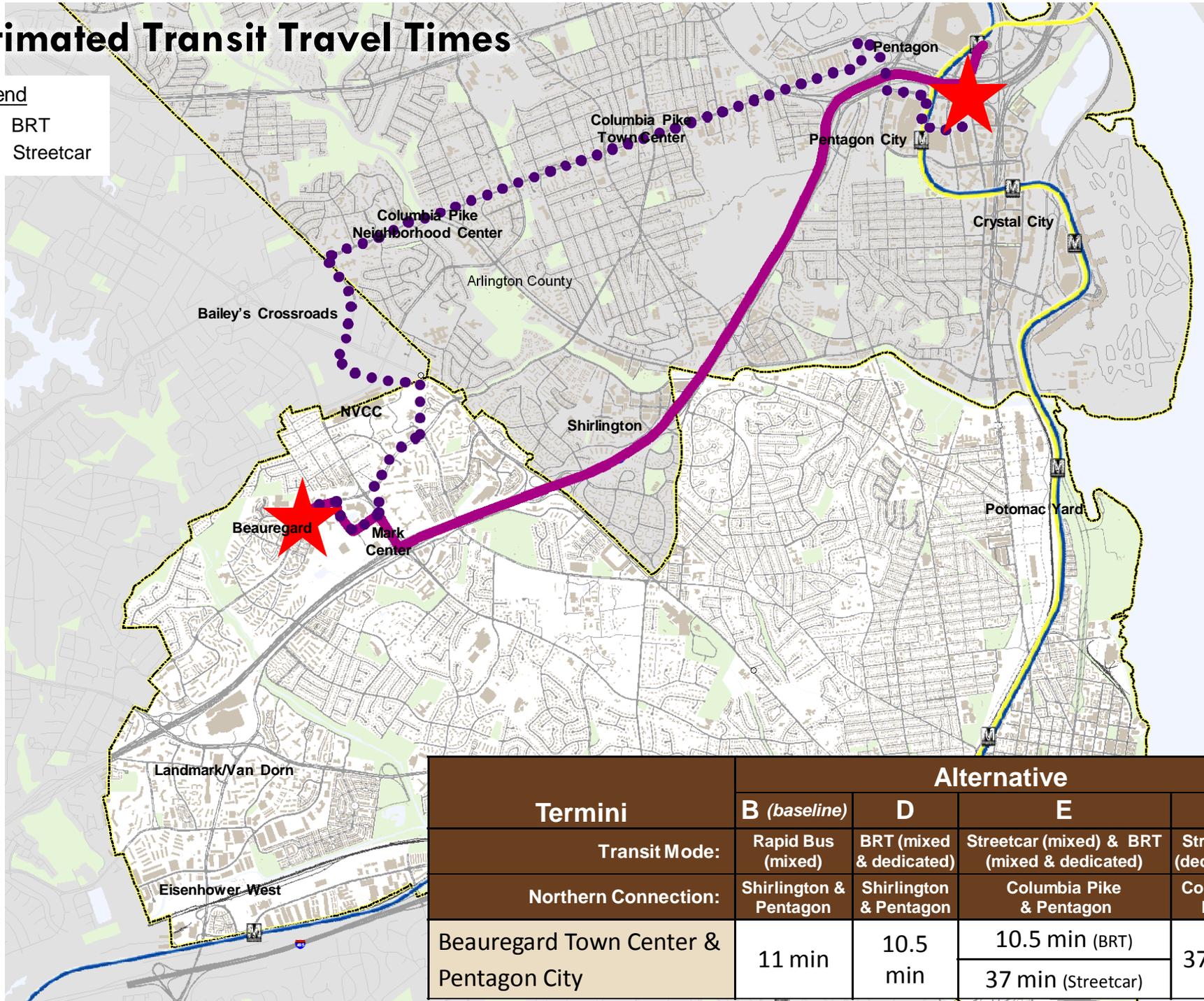


Service (Termini)	Travel Time
Metrorail Blue Line (Van Dorn Station to Pentagon City Station)	16 min
Columbia Pike Streetcar (NVCC to Pentagon City Station)	32 min (forecast)

Estimated Transit Travel Times

Legend

- BRT
- Streetcar

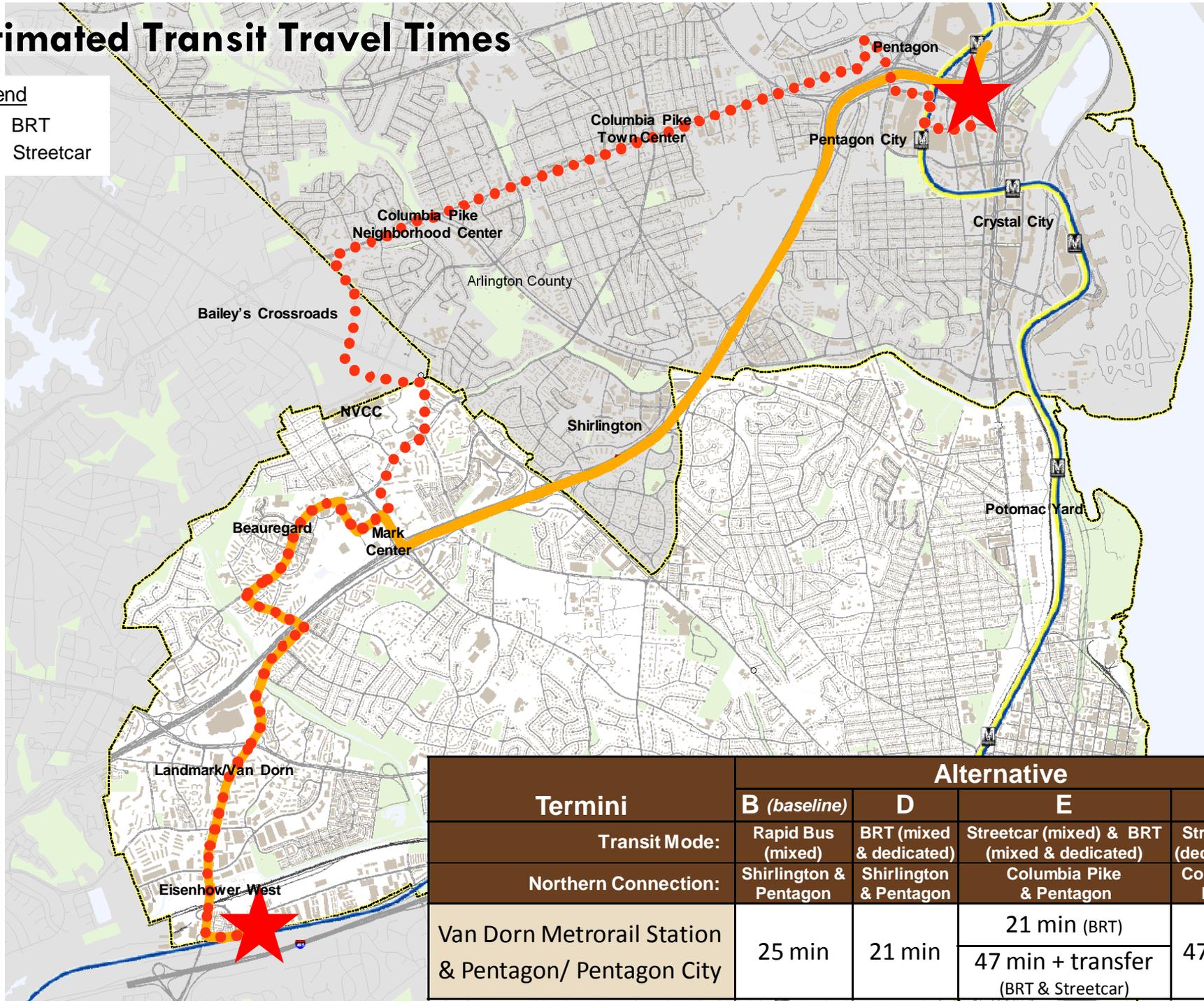


Termini	Alternative			
	B (baseline)	D	E	G
Transit Mode:	Rapid Bus (mixed)	BRT (mixed & dedicated)	Streetcar (mixed) & BRT (mixed & dedicated)	Streetcar (dedicated)
Northern Connection:	Shirlington & Pentagon	Shirlington & Pentagon	Columbia Pike & Pentagon	Columbia Pike
Beaugard Town Center & Pentagon City	11 min	10.5 min	10.5 min (BRT)	37 min
			37 min (Streetcar)	

Estimated Transit Travel Times

Legend

- BRT
- Streetcar

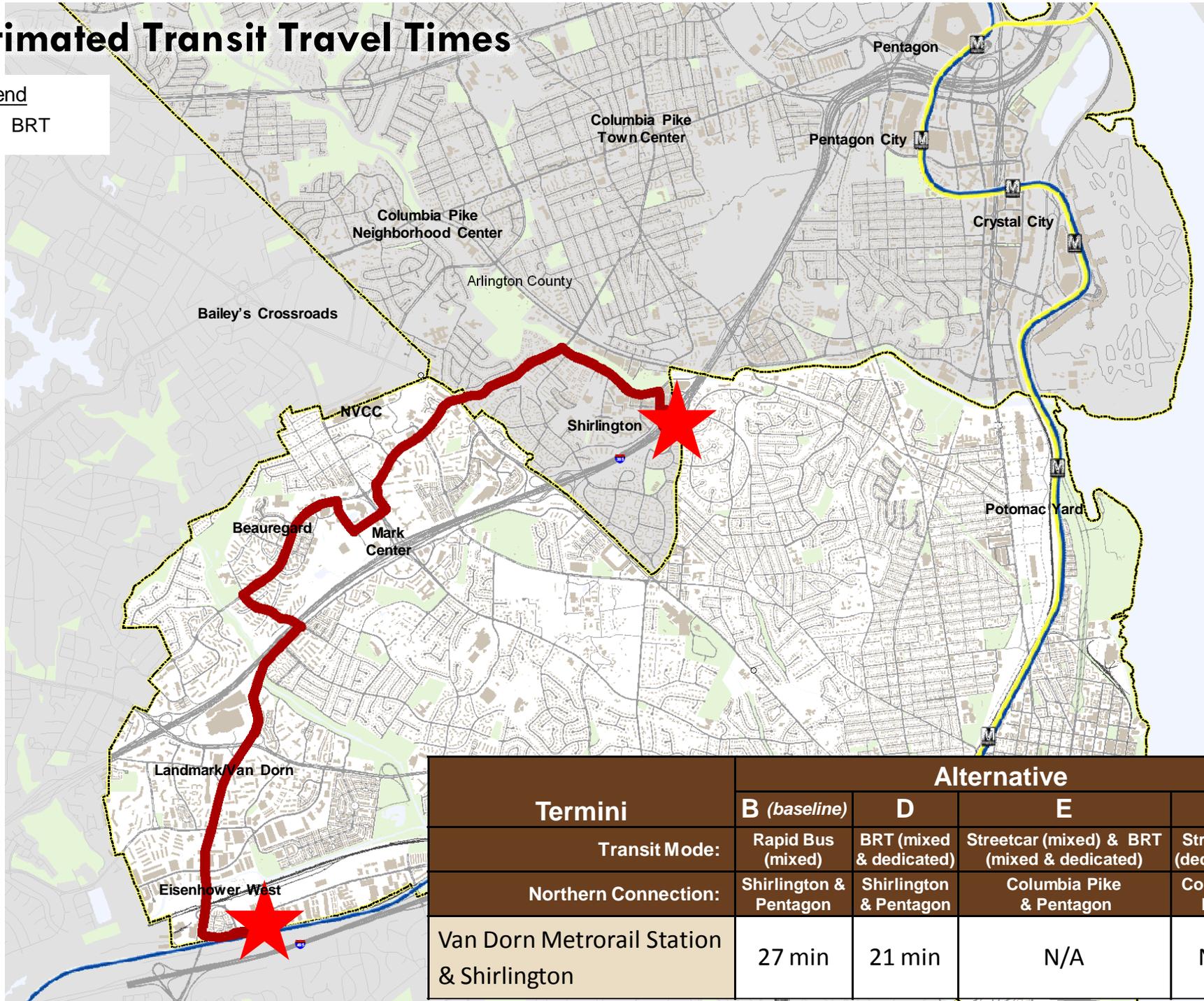


Termini	Alternative			
	B (baseline)	D	E	G
Transit Mode:	Rapid Bus (mixed)	BRT (mixed & dedicated)	Streetcar (mixed) & BRT (mixed & dedicated)	Streetcar (dedicated)
Northern Connection:	Shirlington & Pentagon	Shirlington & Pentagon	Columbia Pike & Pentagon	Columbia Pike
Van Dorn Metrorail Station & Pentagon/ Pentagon City	25 min	21 min	21 min (BRT)	47 min
			47 min + transfer (BRT & Streetcar)	

Estimated Transit Travel Times

Legend

 BRT

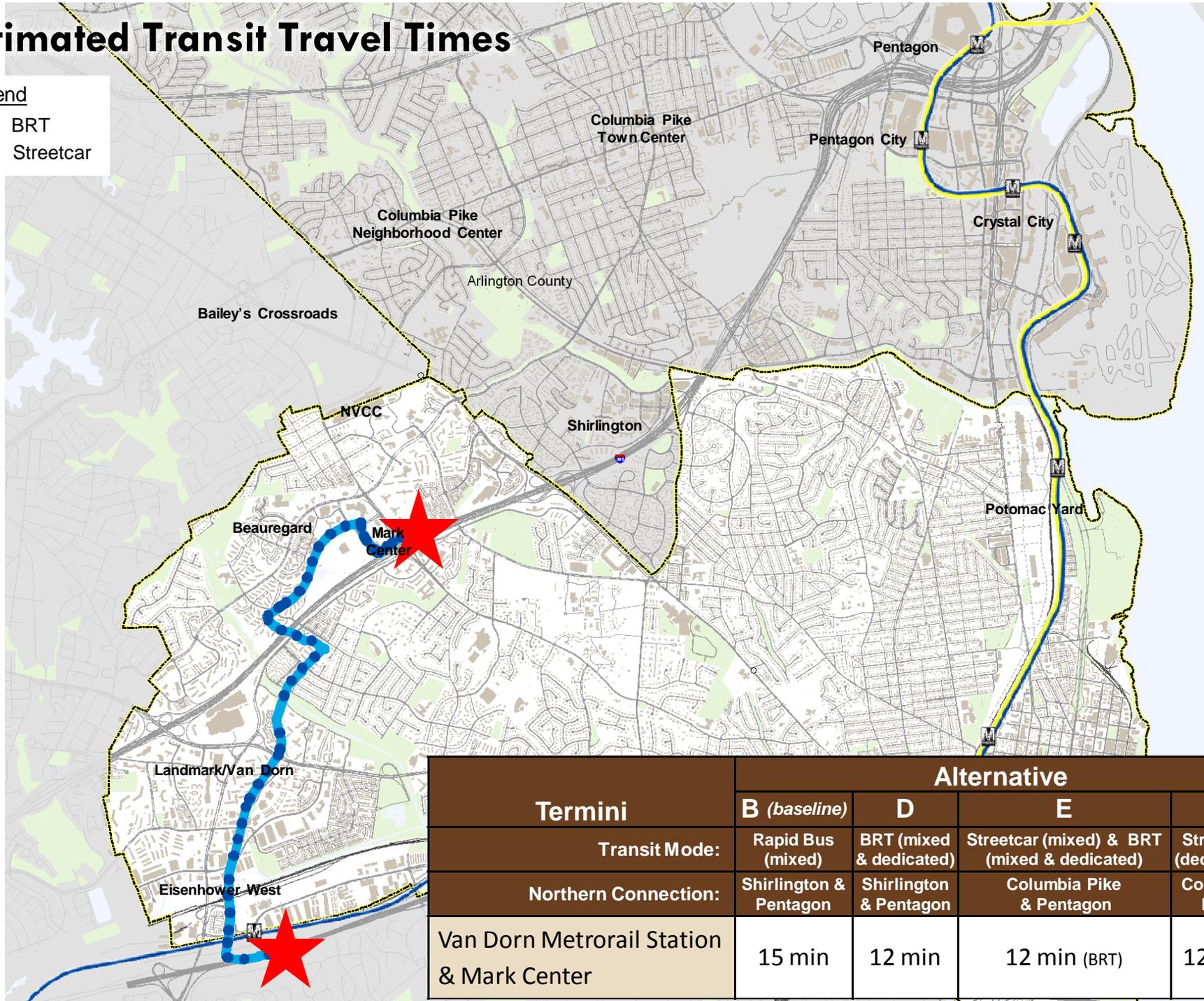


Termini	Alternative			
	B (<i>baseline</i>)	D	E	G
Transit Mode:	Rapid Bus (mixed)	BRT (mixed & dedicated)	Streetcar (mixed) & BRT (mixed & dedicated)	Streetcar (dedicated)
Northern Connection:	Shirlington & Pentagon	Shirlington & Pentagon	Columbia Pike & Pentagon	Columbia Pike
Van Dorn Metrorail Station & Shirlington	27 min	21 min	N/A	N/A

Estimated Transit Travel Times

Legend

- BRT
- Streetcar



Termini	Alternative			
	B (<i>baseline</i>)	D	E	G
Transit Mode:	Rapid Bus (mixed)	BRT (mixed & dedicated)	Streetcar (mixed) & BRT (mixed & dedicated)	Streetcar (dedicated)
Northern Connection:	Shirlington & Pentagon	Shirlington & Pentagon	Columbia Pike & Pentagon	Columbia Pike
Van Dorn Metrorail Station & Mark Center	15 min	12 min	12 min (BRT)	12 min

Planning-Level Ridership Forecasts

	Alternative			
	B <i>(baseline)</i>	D	E	G
Transit Mode:	Rapid Bus (mixed)	BRT (mixed & dedicated)	Streetcar (mixed) & BRT (mixed & dedicated)	Streetcar (dedicated)
Northern Connection:	Shirlington & Pentagon	Shirlington & Pentagon	Columbia Pike & Pentagon	Columbia Pike
Year 2035 Daily Weekday Ridership	-	12,500 to 17,500 riders/day	13,500 to 19,000 riders/day	15,000 to 20,000 riders/day

- Approximately 20% difference between lowest and highest daily ridership

Secondary Evaluation - Effectiveness

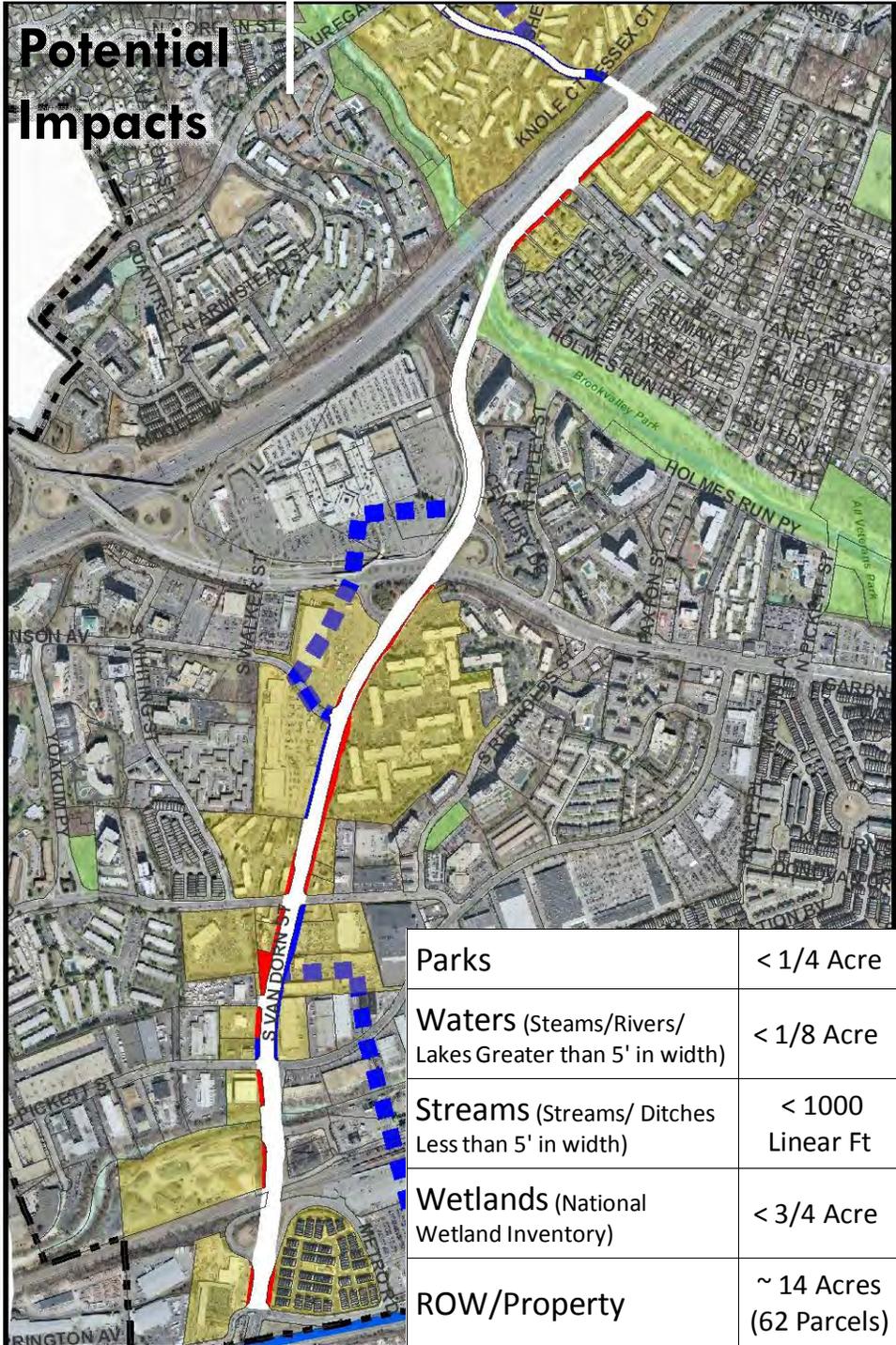
Evaluation Criteria		Alternative				
		B <i>(baseline)</i>	D	E	G	
Transit Mode:		Rapid Bus (mixed)	BRT (mixed & dedicated)	Streetcar (mixed) & BRT (mixed & dedicated)	Streetcar (dedicated)	
Northern Connection:		Shirlington & Pentagon	Shirlington & Pentagon	Columbia Pike & Pentagon	Columbia Pike	
Coverage	Service to Regional Destinations	●	●	●	●	
	Service to Population, Employment, & Retail in the Corridor	●	●	●	●	
	Transit Connectivity	●	●	●	●	
Operations	Running-way Configuration(s)	○	●	●	●	
	Corridor Length	●	●	●	●	
	Capacity	●	●	●	●	
	Interoperability	●	●	●	●	
	Avoidance of Congestion	●	●	●	●	
	Transit Travel Times	In Corridor	●	●	●	●
		Between Termini	●	●	●	○
	Ridership	○	●	●	●	
	Intersection Priority	●	●	●	●	
Align-ment	Alignment Quality	●	●	●	●	
	Runningway Status	●	●	●	●	
Phasing		N/A	●	●	●	

Rating:	●	Best	●	Fair	○	Poor
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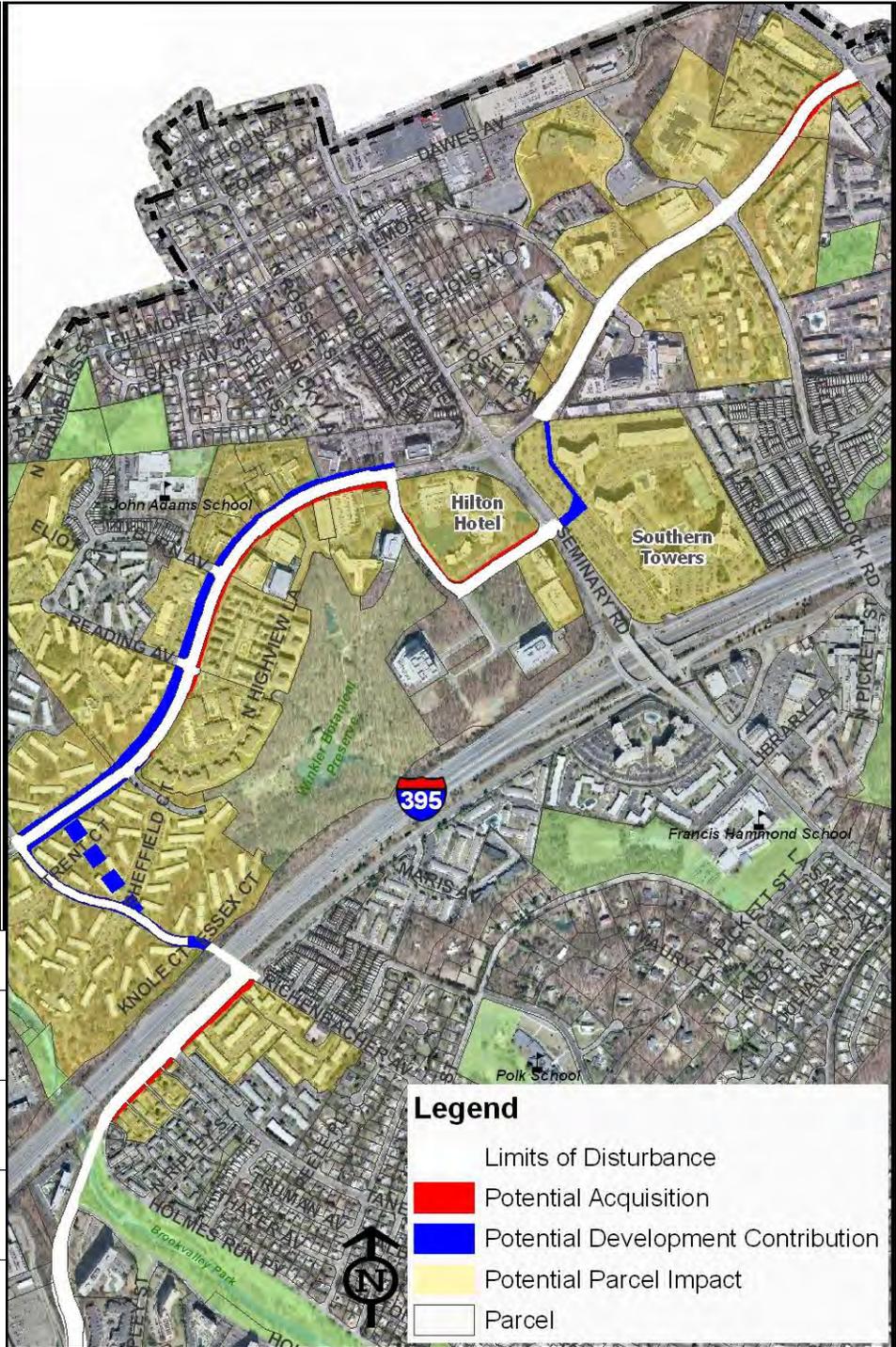
Secondary Evaluation Criteria - Impacts

Criteria Sub-Group	Evaluation Criteria	Measurement Method
Economic	Development Incentive	Perceived value of transit mode technologies with regard to development potential
Natural Environmental	Natural Environment	Summary of key environmental conditions affected (wetlands, floodplains, T&E, streams, and similar)
	Parks and Open Space	Summary of parks and/or open spaces affected
Neighborhood and Community	Property	Number, use type, and quantity of properties impacted with anticipated level of impact (ROW only, partial take, total take)
	Streetscapes	Impact to existing streetscapes
	Community Resources	Identify number and location of historical, cultural, community, archaeological resources affected
	Demographics	Identification of impacts to special populations
	Noise and Vibration	Summarize relative noise and vibration impacts of different mode types and corridor configurations
Transportation	Traffic Flow Impact	Effect of transit implementation on vehicular capacity of corridor
	Traffic Signals	Number of existing signalized intersections affected by transit, identification of need for new signal phases, and number/location of new traffic signals needed to accommodate transit
	Multimodal Accommodation	Impacts to, and ability to accommodate bicycles and pedestrians
	Parking	Impacts to parking

Potential Impacts



Parks	< 1/4 Acre
Waters (Steams/Rivers/ Lakes Greater than 5' in width)	< 1/8 Acre
Streams (Streams/ Ditches Less than 5' in width)	< 1000 Linear Ft
Wetlands (National Wetland Inventory)	< 3/4 Acre
ROW/Property	~ 14 Acres (62 Parcels)



Legend

- Limits of Disturbance
- Potential Acquisition
- Potential Development Contribution
- Potential Parcel Impact
- Parcel

Secondary Evaluation - Impacts

Evaluation Criteria		Alternative			
		B <i>(baseline)</i>	D	E	G
Transit Mode:		Rapid Bus (mixed)	BRT (mixed & dedicated)	Streetcar (mixed) & BRT (mixed & dedicated)	Streetcar (dedicated)
Northern Connection:		Shirlington & Pentagon	Shirlington & Pentagon	Columbia Pike & Pentagon	Columbia Pike
Economic	Development Incentive	○	◐	◐	●
	Natural Environment	●	◐	◐	◐
Neighborhood and Community	Parks and Open Space	●	◐	◐	◐
	Property	●	◐	◐	◐
	Streetscapes	●	◐	◐	◐
	Community Resources	●	●	●	●
	Demographics	●	◐	◐	◐
Transportation	Noise and Vibration	○	◐	◐	●
	Traffic Flow Impact	○	●	●	●
	Traffic Signals	◐	○	○	○
	Multimodal Accommodation	○	◐	◐	●
	Parking	●	◐	◐	◐

Rating:	●	Best	◐	Fair	○	Poor
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Secondary Evaluation Criteria - Cost Effectiveness

Criteria Sub-Group	Evaluation Criteria	Measurement Method
Cost	Capital cost	Order of magnitude capital cost for corridor (stations, runningway, etc.)
	Operating cost	Order of magnitude operating cost
	Cost Per Rider	Order of magnitude operating cost per rider

Assumed Transit Hours of Operations and Headways

Day of Week		Headway	Duration	Total Duration of Operation
Weekdays	Peak	7.5 min	8 hours	18 hours
	Off-Peak	15 min	10 hours	
Saturdays		15 min	18 hours	18 hours
Sundays/ Holidays		20 min	12 hours	12 hours

- Rapid bus, BRT, and streetcar all assume the same duration of service and headways
- Hours of operation are complementary of Metrorail services

Planning-Level Operating Cost Estimate

	Alternative			
	B <i>(baseline)</i>	D	E	G
Transit Mode:	Rapid Bus (mixed)	BRT (mixed & dedicated)	Streetcar (mixed) & BRT (mixed & dedicated)	Streetcar (dedicated)
Northern Connection:	Shirlington & Pentagon	Shirlington & Pentagon	Columbia Pike & Pentagon	Columbia Pike
Annual Operating Cost	\$3.9 M	\$3.5 M	\$4.2 M	\$3.4 M
25-year Operating Cost ^{1, 2}	\$67 M	\$60 M	\$73 M	\$59 M
Average Operating Cost/Rider	N/A	\$1.80	\$2.00	\$1.50

- Streetcar has lowest operating cost
- Mixed mode option has highest operating cost
- 20% difference between highest and lowest operating costs

Notes

1. Operating costs assume an annual 3% inflation rate

2. Operating costs are for portions of the transitways in the City of Alexandria only

Planning-Level Cost Estimates

	Alternative			
	B <i>(baseline)</i>	D	E	G
Transit Mode:	Rapid Bus (mixed)	BRT (mixed & dedicated)	Streetcar (mixed) & BRT (mixed & dedicated)	Streetcar (dedicated)
Northern Connection:	Shirlington & Pentagon	Shirlington & Pentagon	Columbia Pike & Pentagon	Columbia Pike
Capital Cost Estimate¹ <small>(exclusive of vehicles, based on modal cost per-mile within the City and maintenance facility cost estimation)</small>	\$15 M	\$48 M	\$67 M	\$185 M
25-year Fleet Cost Estimate²	\$24 M	\$20 M	\$34 M	\$29 M
Right-of-Way Cost Estimate^{1, 3}	\$0 M	\$33 M	\$43 M	\$50 M
25-year Operating Cost	\$67 M	\$60 M	\$73 M	\$59 M
Planning-Level Cost Estimate⁴	\$106 M	\$161 M	\$ 217 M	\$323 M

Notes

1. Costs assume that Arlington's Columbia Pike streetcar terminates at NVCC at a maintenance facility. Costs for Alternatives E and G would be higher if the Columbia Pike maintenance facility is located in Long Bridge Park due to the location of the terminus of Columbia Pike.
2. Streetcar fleet costs are for the Alexandria portion of the streetcar only and are assumed to supplement Arlington's Columbia Pike fleet.
3. Right of way costs do not include property along Eisenhower Avenue, within Northern Virginia Community College, or in locations where development contribution is expected.
4. Planning level cost estimates are shown in year 2010 dollars and do not include additional contingency or escalation to a future year mid-point of construction. Totals listed do not include costs for major utility relocations/new service, or the capital costs for roadway/streetscape improvements that may be implemented concurrently, but are not required for the transit project. Alignments designated as "optional" or "phased" are not included in the cost.

Secondary Evaluation - Cost Effectiveness

Evaluation Criteria		Alternative			
		B <i>(baseline)</i>	D	E	G
Transit Mode:		Rapid Bus (mixed)	BRT (mixed & dedicated)	Streetcar (mixed) & BRT (mixed & dedicated)	Streetcar (dedicated)
Northern Connection:		Shirlington & Pentagon	Shirlington & Pentagon	Columbia Pike & Pentagon	Columbia Pike
Cost Effectiveness	Capital Cost	●	◐	◐	○
	Right-of-Way Cost	●	◐	○	○
	Operating Cost	◐	●	◐	●
	Order of Magnitude Cost Per Rider	-	◐	○	●

Rating:	●	Best	◐	Fair	○	Poor
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Notes

1. Costs assume that Arlington's Columbia Pike streetcar terminates at NVCC at a maintenance facility. Costs for Alternatives E and G would be higher if the Columbia Pike maintenance facility is located in Long Bridge Park due to the location of the terminus of Columbia Pike.
2. Streetcar fleet costs are for the Alexandria portion of the streetcar only and are assumed to supplement Arlington's Columbia Pike fleet.
3. Right of way costs do not include property along Eisenhower Avenue, within Northern Virginia Community College, or in locations where development contribution is expected.
4. Planning level cost estimates are shown in year 2010 dollars and do not include additional contingency or escalation to a future year mid-point of construction. Totals listed do not include costs for major utility relocations/new service, or the capital costs for roadway/streetscape improvements that may be implemented concurrently, but are not required for the transit project. Alignments designated as "optional" or "phased" are not included in the cost.

New Starts/Small Starts Recent Funding Allocations

- FTA Fiscal Year 2012 Funding Recommendations
 - 6 BRT projects, 3 LRT projects, 1 Heavy Rail project
- Bus Rapid Transit Projects
 - Range of project capital costs: \$21 to +\$200 million
 - Range of FTA funding participation
 - 35% to 80% federal funding
 - Maximum participation (Small Starts, 80% or \$75 million, whichever is less)
- Light Rail Transit Projects
 - No streetcar projects currently funded in FY 2012 allocation
 - Range of project capital costs: \$200 million to \$1.5 billion
 - Range of FTA funding participation
 - 40% to 60% federal funding
 - Maximum participation – varies, generally in 50% to 60% range



TRANSITWAY CORRIDOR FEASIBILITY STUDY

FTA Recommended FY 2012 Allocations

Project	Project Type	Total Capital Cost (millions)	Federal Share	Local Share	Federal Percent	Section 5309 Project Type
<u>Bus Rapid Transit Projects</u>						
East Bay BRT (Oakland, CA)*	BRT	\$ 216.12	\$ 75.00	\$ 141.12	35%	Small Starts
King County RapidRide F Line (Seattle, WA)	BRT	\$ 36.80	\$ 15.88	\$ 20.92	43%	Small Starts
King County RapidRide E Line (Seattle, WA)	BRT	\$ 48.09	\$ 21.63	\$ 26.46	45%	Small Starts
Mesa Corridor BRT (El Paso, TX)	BRT	\$ 27.08	\$ 13.54	\$ 13.54	50%	Small Starts
Silver Line BRT (Grand Rapids, Michigan)	BRT	\$ 37.00	\$ 29.60	\$ 7.40	80%	Small Starts
Fresno Area Express (Fresno, CA)	BRT	\$ 48.2	\$ 38.55	\$ 9.64	80%	Small Starts
JTA BRT North (Jacksonville, FL)	BRT	\$ 21.3	\$ 17.04	\$ 4.26	80%	Small Starts
<u>Light Rail Projects</u>						
Central Mesa LRT Extension (Mesa, Arizona)	LRT	\$ 198.49	\$ 75.00	\$ 123.49	38%	Small Starts
Draper Transit Corridor (Draper, UT)	LRT	\$ 206.30	\$ 123.62	\$ 82.68	60%	New Starts
Portland-Milwaukie LRT (Portland, Oregon)	LRT	\$ 1,490.35	\$ 745.18	\$ 745.17	50%	New Starts

*Previous year allocation, included to show larger scale BRT project



Corridor C - Conceptual Project Funding Scenario

Project	Transit Mode	Total Capital Cost (millions)	Federal Share (millions)	Local Share (millions)	Federal Percent	Section 5309 Project Type
Alternative D	BRT	\$ 88.0	\$ 70.4	\$ 17.6	80%	Small Starts
Alternative G	Streetcar	\$ 250.00	\$ 150.0	\$ 100.0	60%	New Starts

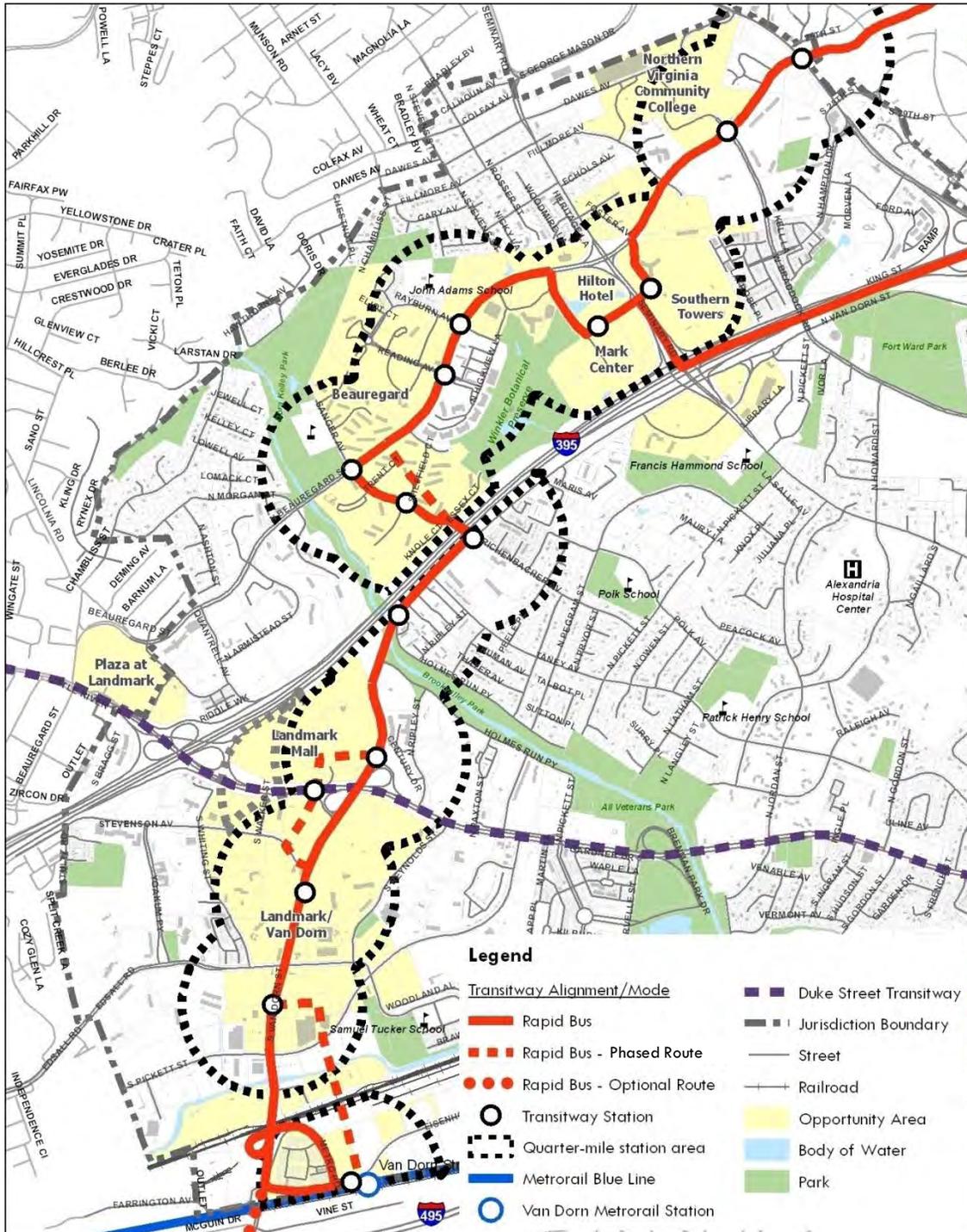
- **Small Starts Scenario – Alternative D (BRT)**
 - Assumes maximum of \$75 million or 80% federal funding, whichever is less
 - Project cost: \$88 million
 - Federal portion would be \$70.4 million
 - Local portion would be approximately \$17.6 million

- **New Starts Scenario – Alternative G (Streetcar)**
 - Assumes 60% federal funding
 - Project cost: \$250 million
 - Federal portion would be \$150 million
 - Local portion would be approximately \$100 million



BRIEF SUMMARY OF ADVANTAGES & DISADVANTAGES OF THE ALTERNATIVES





Alternative B: (Baseline) Rapid Bus in Mixed Flow Connecting to Pentagon and Shirlington

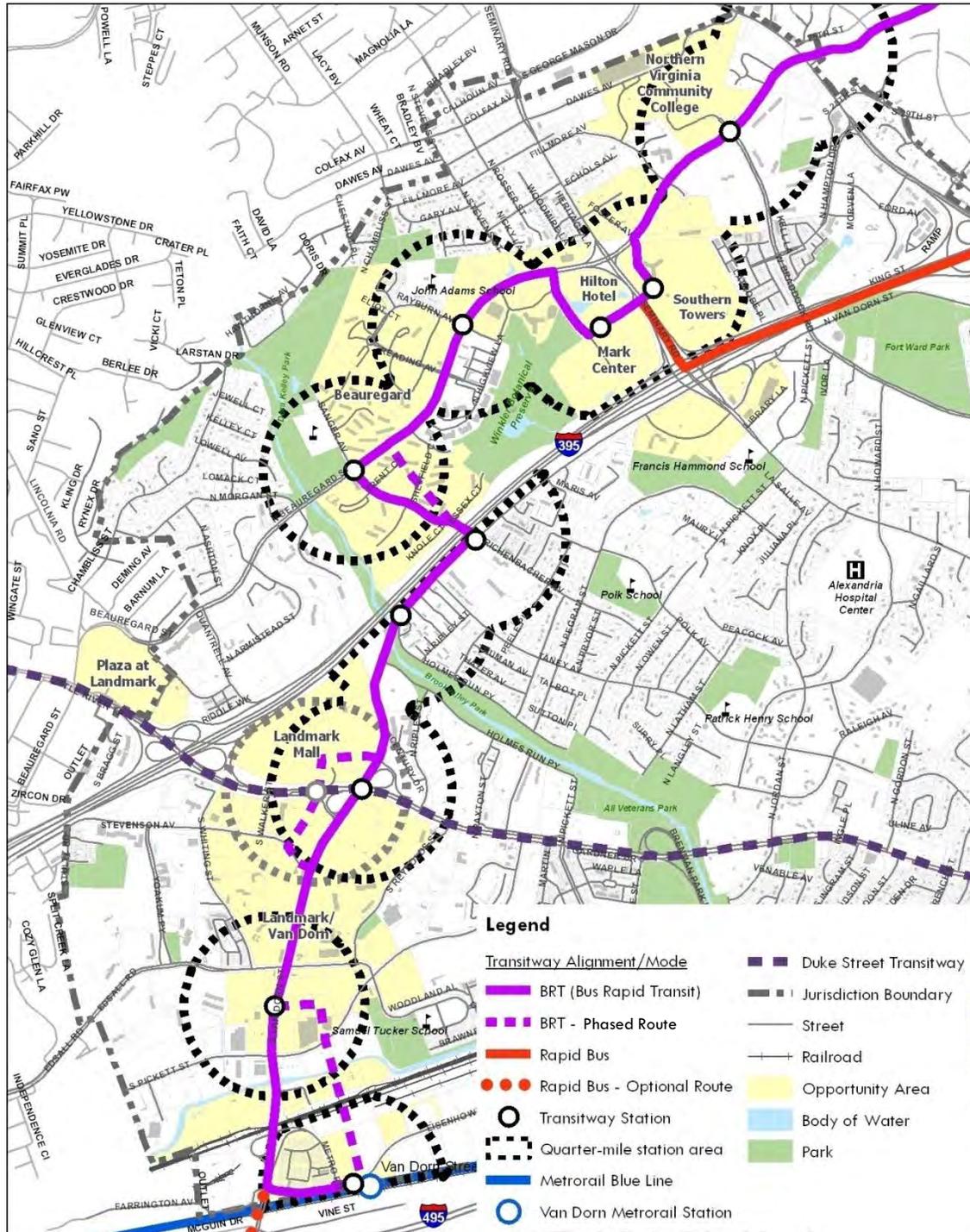
Advantages

- Easy to implement/short timeframe for implementation
- Portions of this alternative are funded through an existing TIGER grant
- Negligible impact on right-of-way, natural environment, communities, existing streetscape, etc.
- Low capital cost
- Would improve transit travel speeds in the corridor, but not as much as other alternatives
- Could be a first phase of any of the other alternatives

Disadvantages

- Travels in mixed flow, would be affected by congestion at some locations
- Higher operating cost than other options
- May be less attractive to riders than more capital-intensive alternatives
- Would create delay for traffic due to stopping buses

Alternative D: Bus Rapid Transit Connecting to Pentagon and Shirlington



Advantages

- Serves multiple regional destinations
- Moderate capital cost – less than streetcar and mixed mode options
- Significant improvement in transit travel speeds between termini
- Relatively efficient from an operations perspective
- Could be a phase of a streetcar alternative

Disadvantages

- May be less attractive to developers to incentivize redevelopment
- Has right-of-way and other physical impacts
- Transfer required to connect to Columbia Pike streetcar if implemented to NVCC campus

Other

- Less total capacity than streetcar; however, has more seated capacity than streetcar (assumes similar headways)

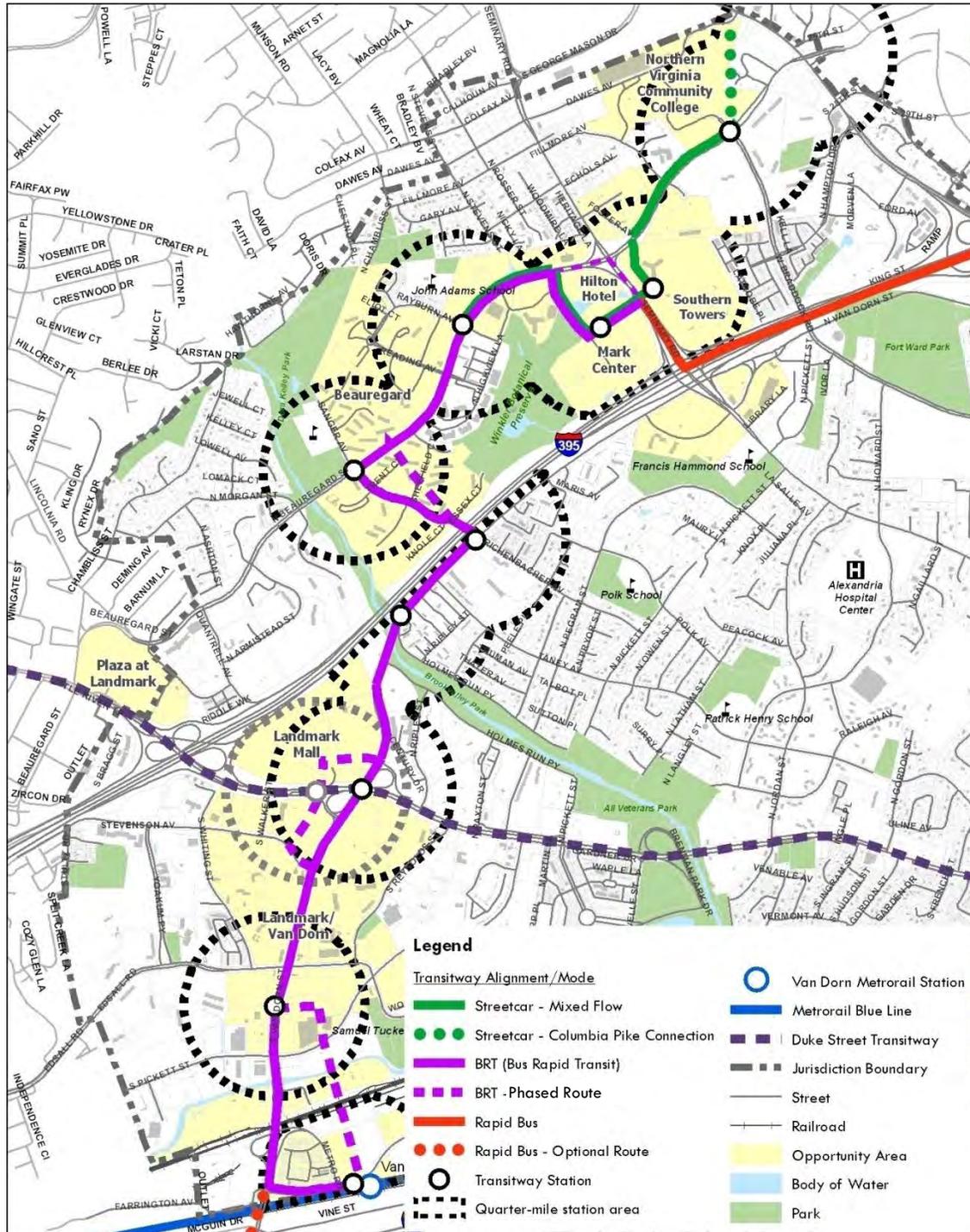
Alternative E: Bus Rapid Transit Connecting to Pentagon and Streetcar in Mixed Flow Connecting to Beauregard Town Center

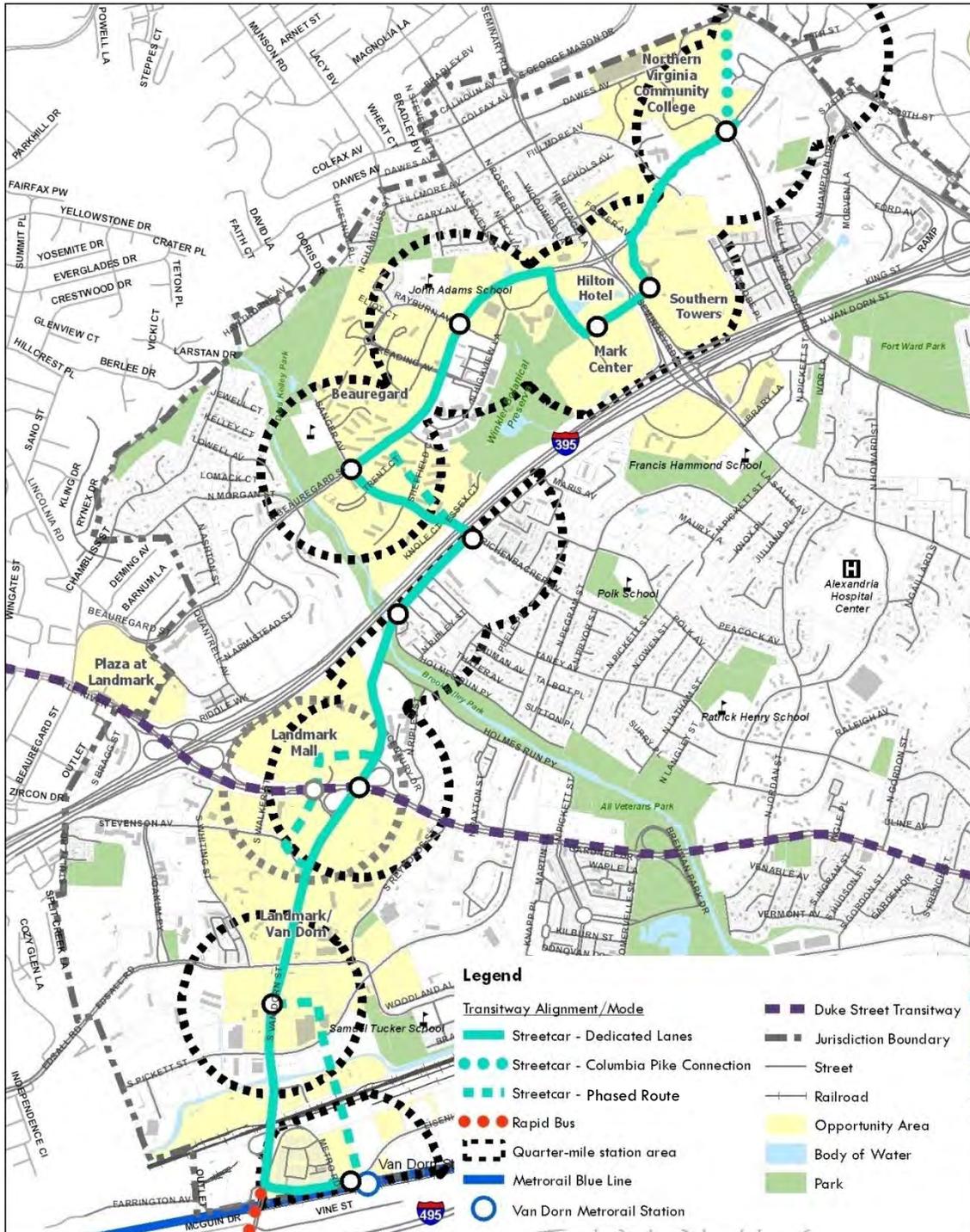
Advantages

- Serves many local and regional destinations
- Moderate-high capital cost – less than streetcar only options, more than BRT only options
- Significant improvement in transit travel speeds between termini
- Flexibility in connection to Columbia Pike
- Could be a phase of a full streetcar alternative
- Some attraction to developers

Disadvantages

- Has right-of-way and other physical impacts
- Some transfers required to connect to Columbia Pike streetcar
- Highest operational cost of alternatives





Alternative G: Streetcar in Dedicated Lanes Connecting to Columbia Pike

Advantages

- Single-seat connection from Van Dorn Metrorail Station to Pentagon/Pentagon City via streetcar
- Significant improvement in transit travel speeds within the Van Dorn/Beauregard corridor
- Some attractiveness to developers
- Lowest operational cost of alternatives (Columbia Pike costs not included)
- Most attractive to development community

Disadvantages

- Substantially higher capital cost than other alternatives studied
- Columbia Pike travel speeds for streetcar will be low (~8 mph)
- Longest travel time between termini
- Has right-of-way and other physical impacts

DISCUSSION & COMMENTS



Thank you for your attention!

For access to the information that was presented tonight, as well as other study information, please visit the project website at:

- <http://alexandriava.gov/HighCapacityTransit>

Once there, follow the link for the “High Capacity Transit Corridor Work Group”

