

TRANSITWAY CORRIDOR FEASIBILITY STUDY



703-370-DASH
ROUTE 2 LINCOLNIA
5 VAN DORN ST M
7 LANDMARK MALL

NOR

DASH
703-370-DASH
NO PARKING
LOADING ZONE
8AM-6PM



Alexandria City Council – Work Session
June 14, 2011

Corridor C Transitway Alternatives and Recommendation



T&ES



Kimley-Horn
and Associates, Inc.

Meeting Agenda

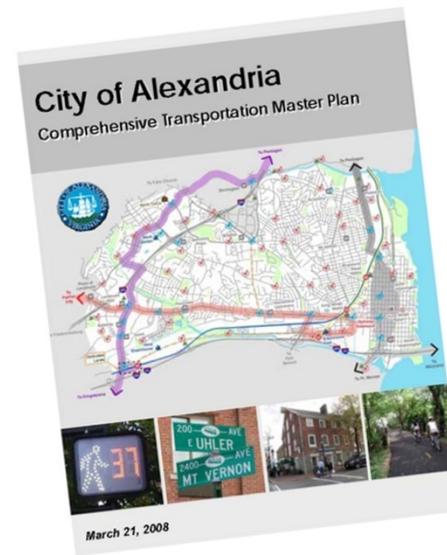
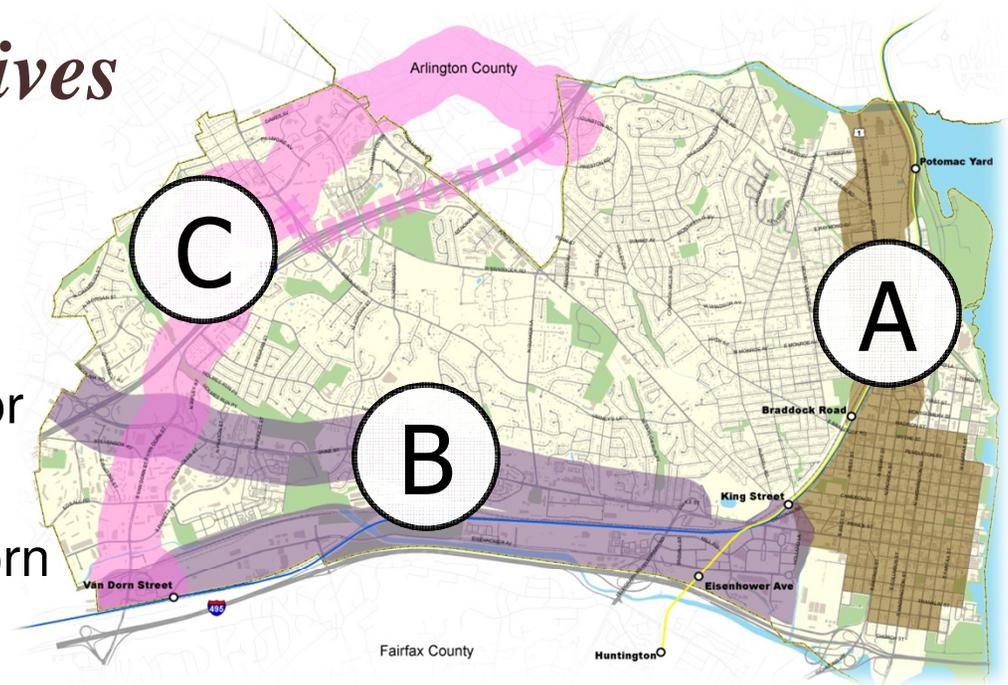
- Study Purpose and Background
- High Capacity Transit Corridor Work Group
- Project Status
- Overview of Corridor C Alternatives and Analysis
- Corridor C Preliminary Recommendation
- System Characteristics
- Next Steps



TRANSITWAY CORRIDOR FEASIBILITY STUDY

City Transitway Initiatives

- Development of a plan for dedicated transit services in three corridors
 - Corridor A: North-South Corridor
 - Corridor B: Duke/Eisenhower
 - Corridor C: Beauregard/Van Dorn



History of Transitway Corridors

- Corridors identified in regional plans
- Transportation Master Plan
 - Corridor A (North-South)
 - Corridor B (Duke Street / Eisenhower Avenue)
 - Corridor C (Beauregard / Van Dorn)
- City Council Strategic Plan
- Approved Small Area Plans assume High-Capacity Transit Corridors
- Crystal City-Potomac Yard Transitway funded and in design



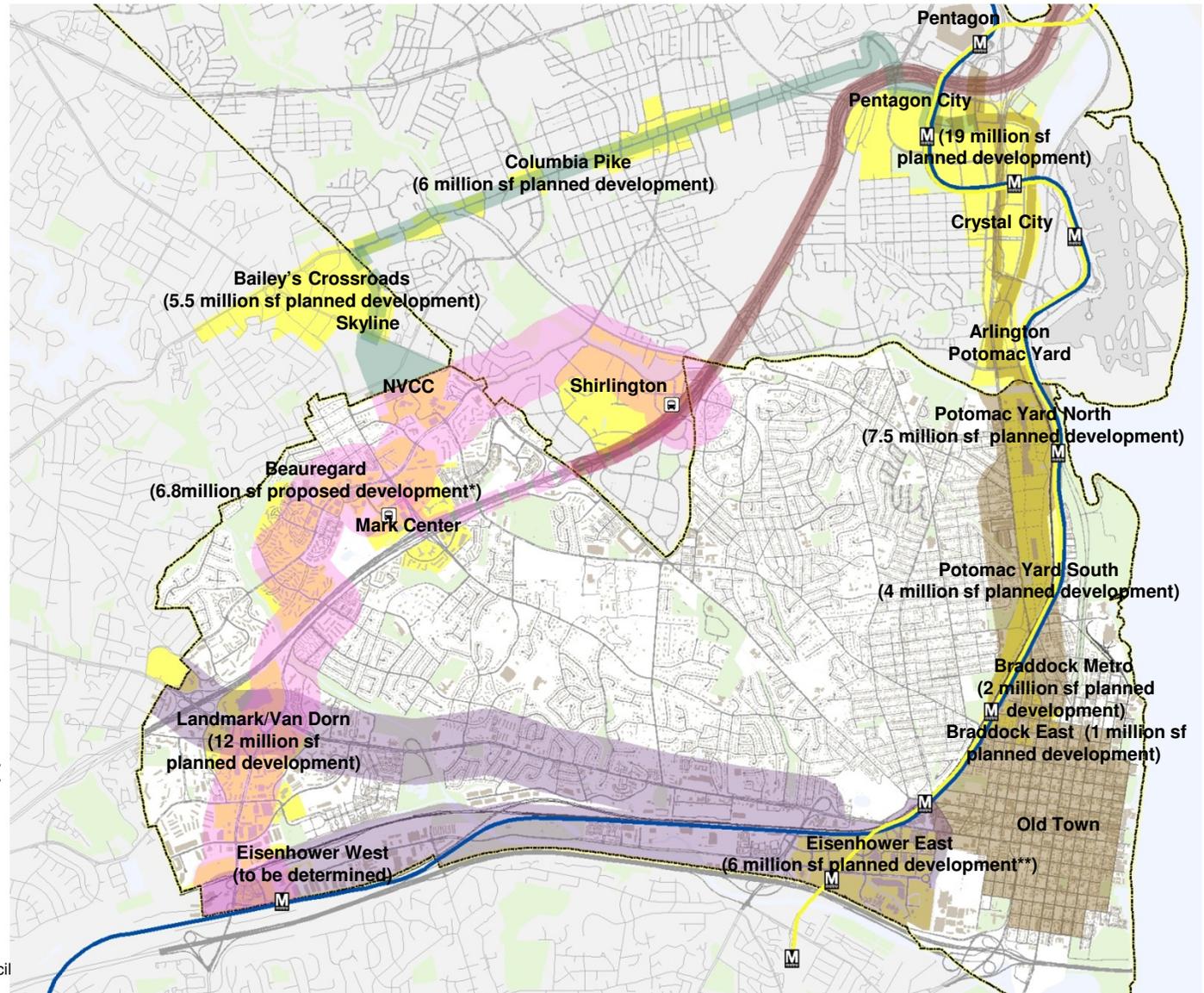
Background

- Transportation Master Plan Update (2008)
- Council Strategic Plan (2010)
- Transitway Corridor Feasibility Study (Began 2010)
 - Builds on Transportation Master Plan
 - Identify / Adopt transit concept and action plan for each corridor



Land Use and Transportation Connectivity

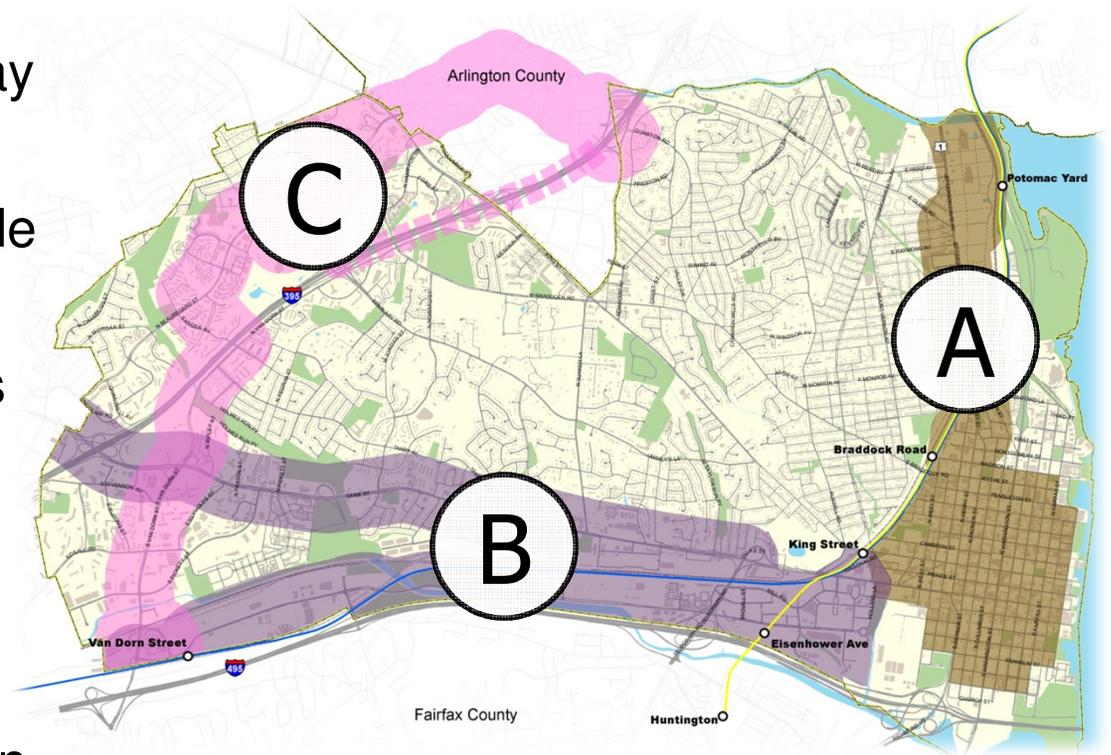
- Beaugard corridor plan
- Braddock Metro & Braddock East plans
- Columbia Pike Initiative
- Crystal City plan
- Eisenhower East plan
- Eisenhower West area development
- Landmark/Van Dorn corridor plan
- Mark Center plan
- Metrorail blue & yellow lines
- NVCC Community College master plan
- Old Town
- Pentagon
- Pentagon City development
- Potomac Yard plans (Arlington and Alexandria)
- Shirlington



Regional development values approximate
*Value approximate based on current developer plans for Beaugard Area that have not been approved by City Council
**Value does not include Carlyle

General Study Goals

- Define location and configuration of the transitway in each corridor
- Identify preferred transit mode technology for each corridor
- Develop plans for operations for each corridor
- Identify potential station locations
- Develop action plan - environmental documentation, funding levels/request, design, operations, governance, etc.



Technical Process

- High Capacity Transit Corridor Work Group
- Inventory, Review, and Analysis
- Concept Development and Refinement
- Land Use and Development Coordination
- Implementation and Action Plan



High Capacity Transit Corridor Work Group

To provide citizen inputs to such issues as include **route alignments, cross-sections, methods of operation, types of vehicles** which should be used in these corridors at specific times, **land use considerations, ridership, and financial implications.**

- City Council – 2 representatives
- Planning Commission
- Transportation Commission
- Budget & Fiscal Affairs Advisory Committee
- Chamber of Commerce
- Federation of Civic Associations – 2 representatives
- Resident with Transit Planning Expertise



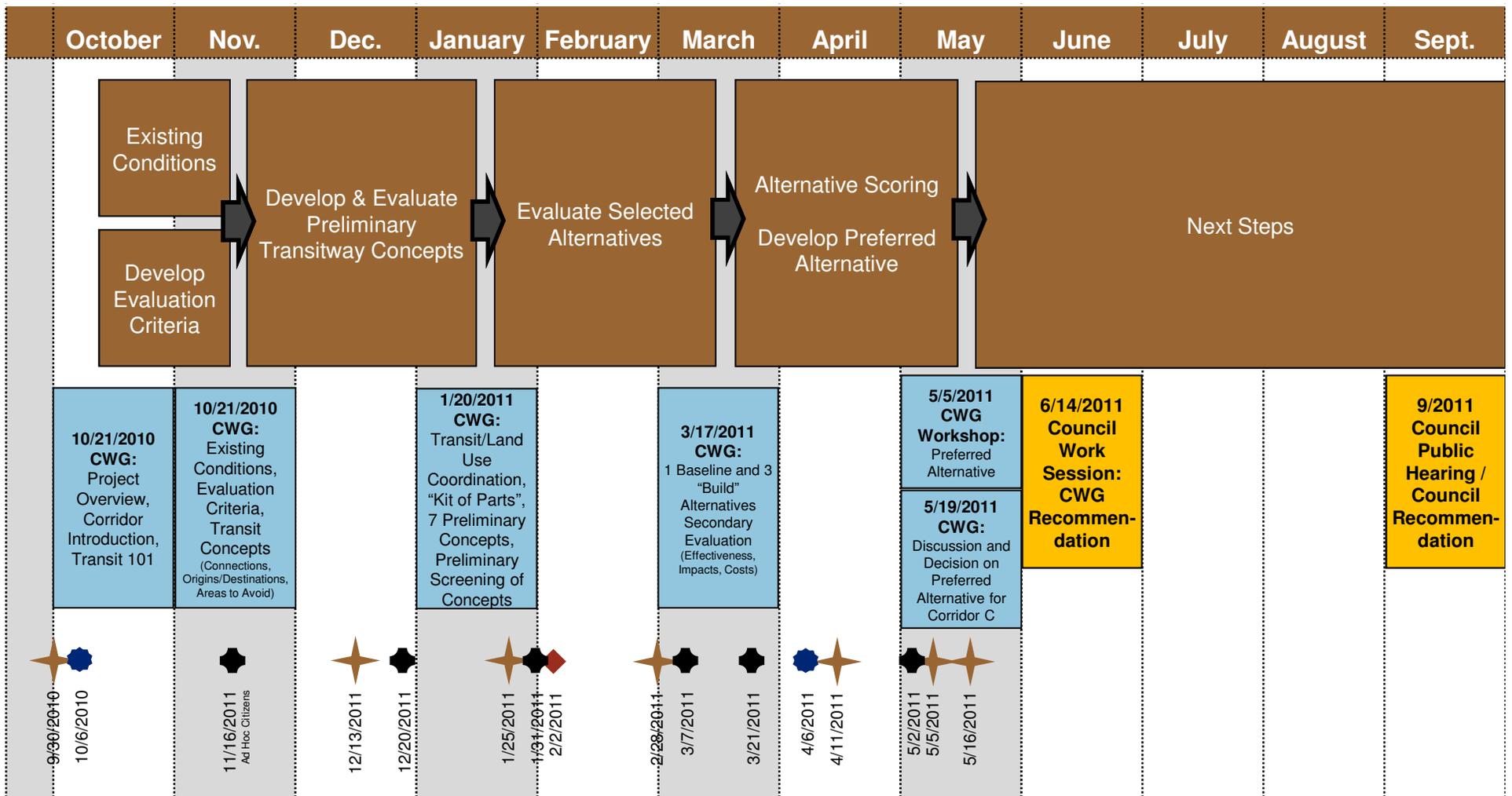
Project Status

- Corridor C (Van Dorn / Beauregard)
 - Completed existing conditions, needs assessment, and alternatives development
 - Completed first and secondary screening of alternatives
 - Presented results of secondary screening to Corridor Work Group (CWG) on March 17
 - Held work session with CWG on May 5, 2011
 - Consultant recommendation presented to CWG - Mid May
 - Corridor Work Group made recommendation at May 19 meeting



TRANSITWAY CORRIDOR FEASIBILITY STUDY

Project History – Corridor C

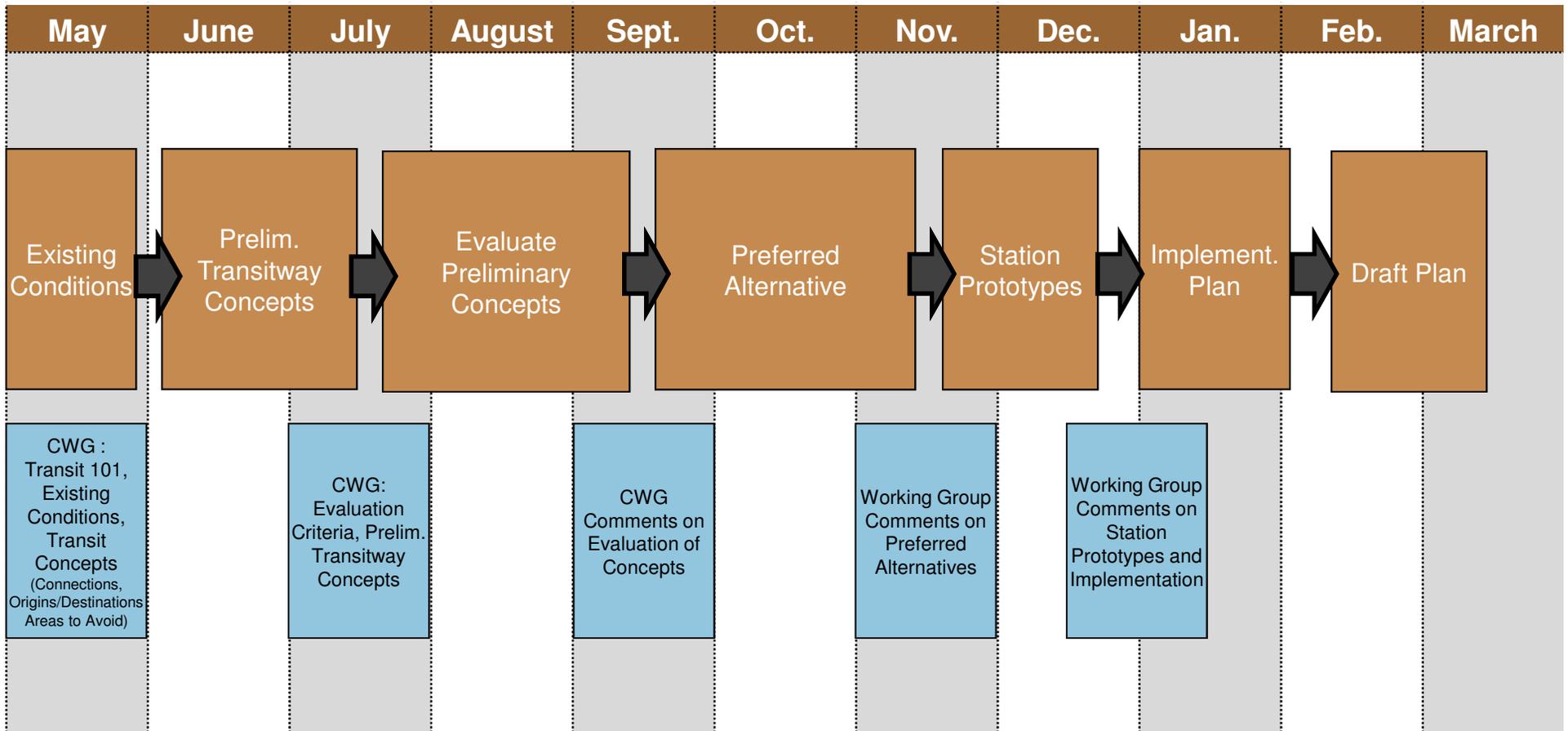


Legend

- Beaugard Corridor Plan Meeting
- Beaugard Corridor Stakeholder's Group
- Planning Commission
- Transportation Commission

TRANSITWAY CORRIDOR FEASIBILITY STUDY

Project Schedule – Corridors A & B



Corridor C

ALTERNATIVES AND ANALYSIS



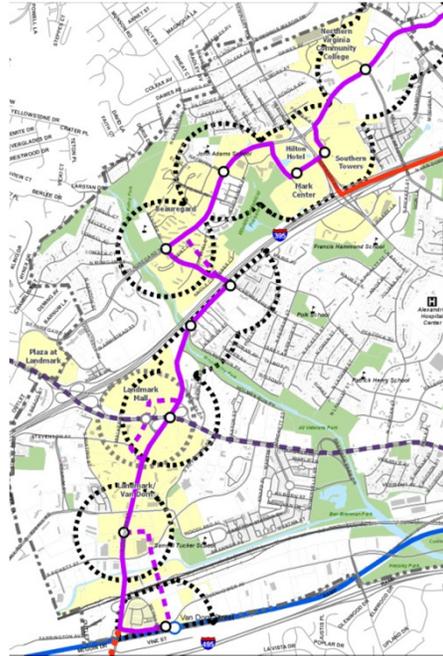
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Alternative B (baseline)



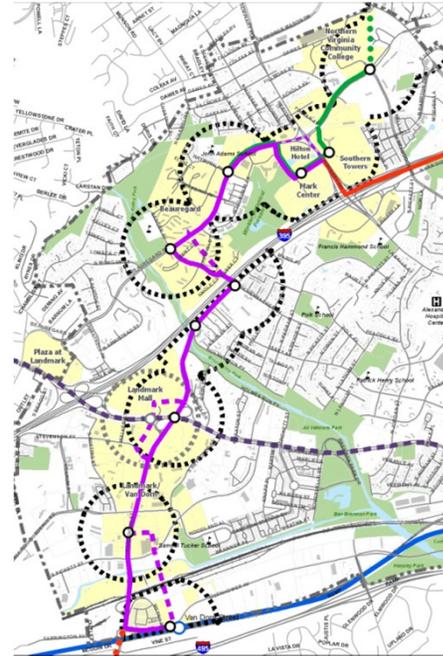
- Rapid bus
- Possible preliminary phase of any other alternative
- Baseline for evaluation

Alternative D



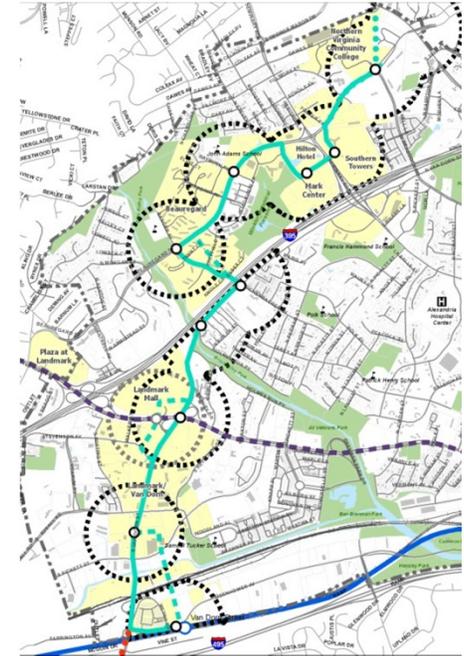
- BRT
- Dedicated lanes
- Shirlington and Pentagon/Pentagon City connections

Alternative E



- BRT and streetcar
- Dedicated lanes
- Columbia Pike and Pentagon/Pentagon City connections

Alternative G



- Streetcar option
- Dedicated lanes
- Columbia Pike connection

Legend

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



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		●	●	●	●	

Rating:	●	Best	●	Fair	○	Poor
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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	●	◐	◐	◐
Transportation	Streetscapes	●	◐	◐	◐
	Community Resources	●	●	●	●
	Demographics	●	◐	◐	◐
	Noise and Vibration	○	◐	◐	●
	Traffic Flow Impact	○	●	●	●
Transportation	Traffic Signals	◐	○	○	○
	Multimodal Accommodation	○	◐	◐	●
	Parking	●	◐	◐	◐

Rating:	●	Best	◐	Fair	○	Poor
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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.

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

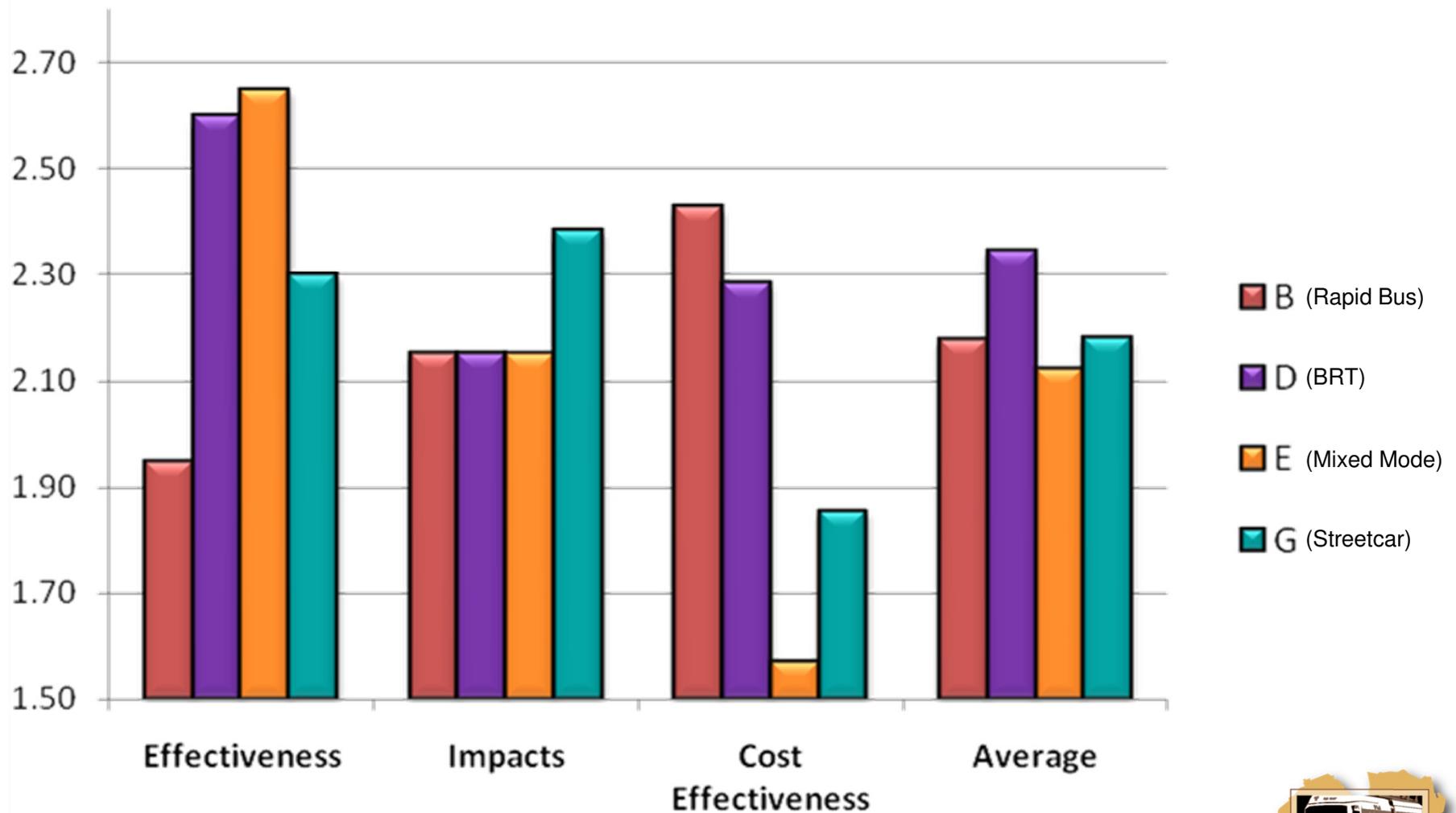
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Secondary Evaluation & Scoring

- Criteria rating: best (3), fair (2), poor (1)
- Several criteria were weighted based on importance
 - Transit travel times in corridor
 - Transit travel times between termini
 - Ridership
 - Phasing
 - Traffic flow impact
 - Capital cost
 - Right-of-way cost
 - Operating cost
- Criteria group scores were computed
- Overall scoring summary for each alternative was developed



Scoring Summary by Evaluation Criteria Group



Corridor C

***PRELIMINARY
RECOMMENDATION***



TRANSITWAY CORRIDOR FEASIBILITY STUDY

Recommendation

Alternative D Bus Rapid Transit in Dedicated Lanes

Connections

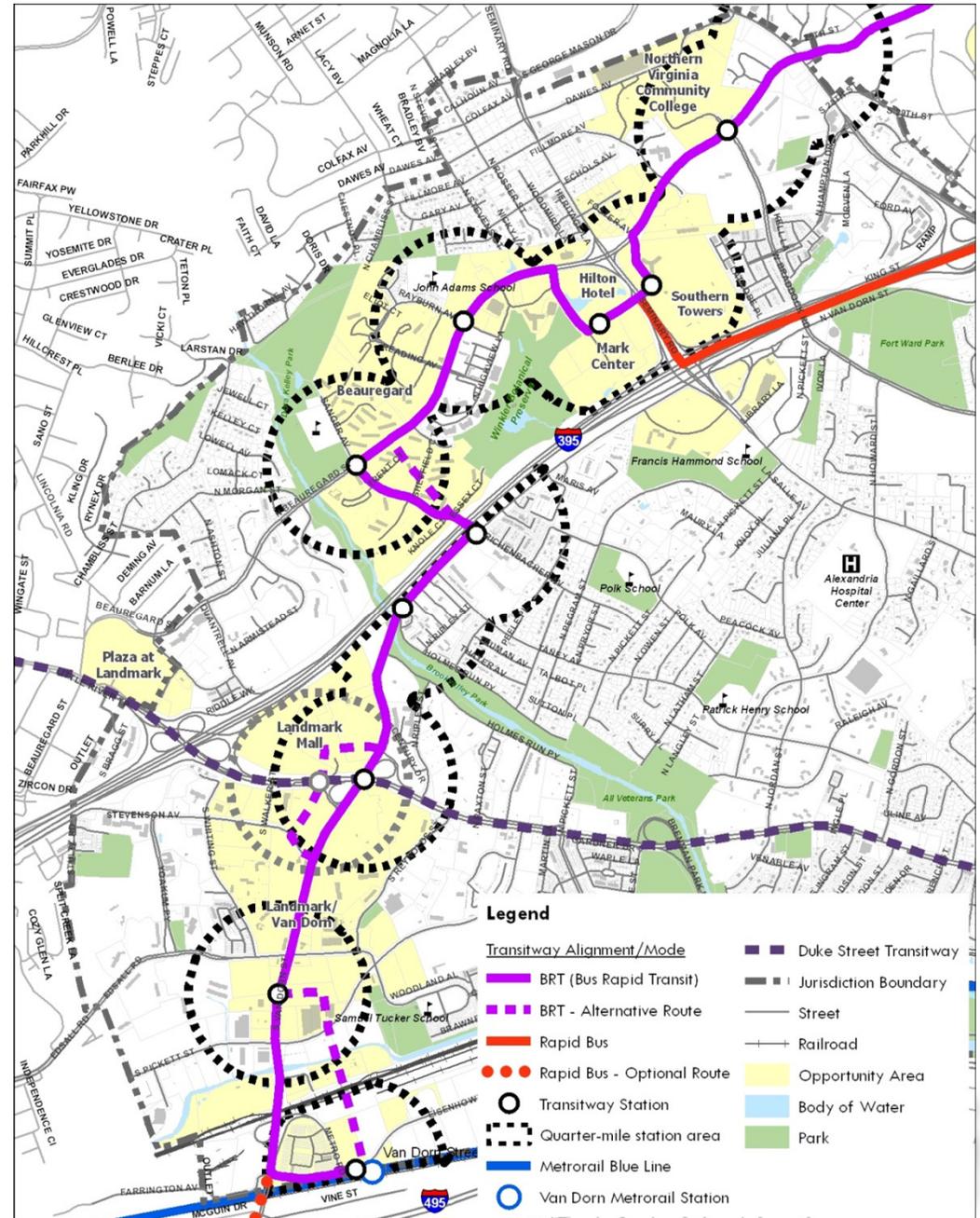
- Van Dorn Metrorail Station
- Landmark Mall
- Mark Center
- Southern Towers
- NVCC
- Shirlington
- Pentagon/Pentagon City

Planning-Level Cost Estimate¹

- Capital: \$48 million
- Fleet (25-year): \$20 million
- ROW²: \$33 million
- Operating (25-year): \$60 million

Notes

1. 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.
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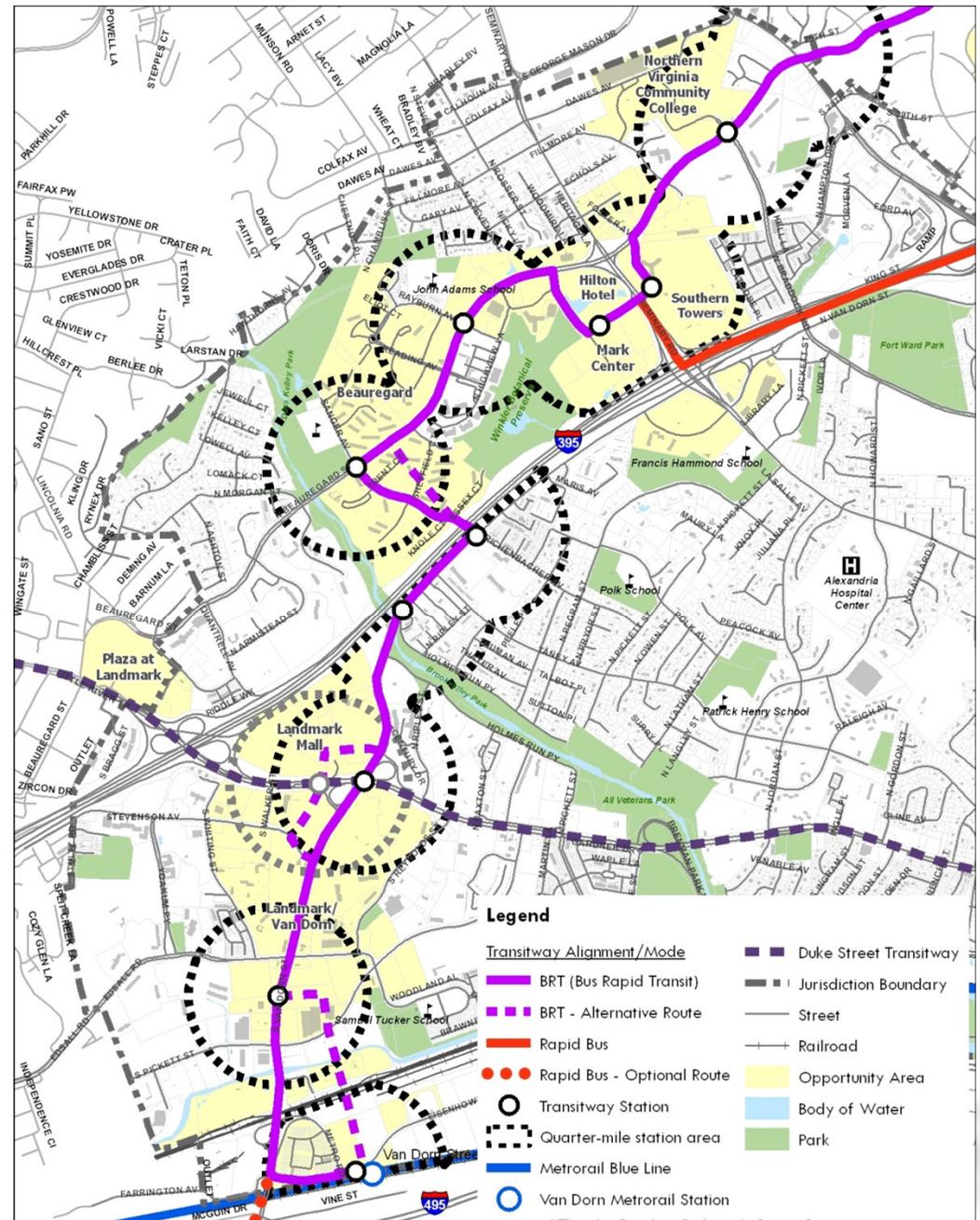
Recommendation

Physical Characteristics

- Low-floor BRT vehicles
- Dedicated lanes (~80% to 90% of corridor)
- Off-board fare collection
- Service specific branding and identity
- Substantial transit stations

Operational Characteristics

- Transit signal priority at intersections
- Real-time service information
- 15-minute peak period headways
- 20-minute off-peak headways
- 18 hours of service (Monday through Saturday)
- 12 hours of service on Sunday



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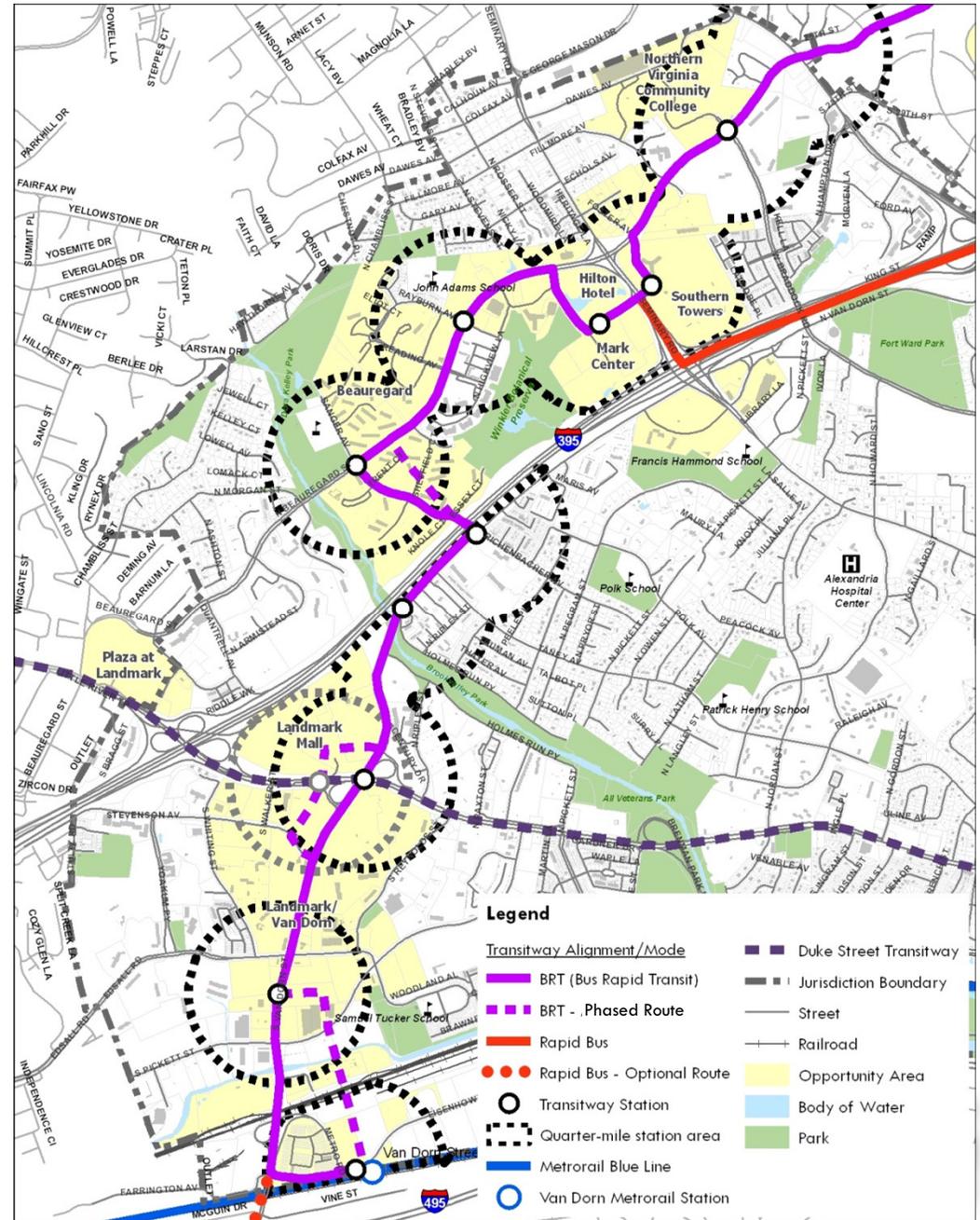
Recommendation

Alternative D

- Reliable and efficient
- Attractive to choice riders
- Significant seated capacity
- Regional and locally interconnected
- Moderate construction cost
- Potential to be attractive for federal funding

Notes

- Construct to not preclude streetcar
- Streetcar could be implemented as a later phase, with supportive conditions



Costs and Funding

What funding sources can be used to construct the transitways?

A number of funding sources would need to be explored, and may include:

- City funds dedicated to transportation
- Federal Transportation funds and programs
- Developer contributions
- General funds
- Owner / Operator contributions
- Tax Increment Financing
- Reallocation of current city monies allocated to WMATA and DASH
- Local Improvement District
- State funding



System Quality

Will the transitway system be of high quality?

All three corridors will have a high quality system, including:

- Dedicated lanes
- Special, branded vehicles
- Intelligent Transportation Systems (i.e., transit signal priority)
- High quality stations
- Improved pedestrian and bicycle connectivity
- Frequent, reliable service
- Good connectivity / interface with Metro stations



Emerald City Express BRT, Eugene, Oregon



Specialized BRT Vehicles

- Typical seated capacity:
30 to 60 passengers
- Typical standing capacity:
30 to 60 passengers
- Typical total capacity:
80 to 90 passengers



X2, Washington DC



MAX, Las Vegas, Nevada



Healthline BRT, Cleveland, Ohio

Lower Volume Stations



Eugene



Amsterdam



Los Angeles



Brisbane

Higher Volume Stations



Brisbane



Bogota TransMilenio



Mexico City



Off-Board Fare Collection Options



*Off-board fare collection
Portland, Oregon*

*Smart card fare gates
TransMilenio, Bogota*



Vehicle/Station Interface: Level, No Gap Boarding, Alighting



Right-of-Way Costs and Funding

Can dedicated lanes be provided without widening the roadway?

- It is important that dedicated lanes be provided for any transitway in order to maintain efficient operation of the system.
- In some locations where space is constricted, dedicated lanes may not be built.
- Roadway widening to build dedicated transit lanes was supported by most members of the Corridor Work Group and the public. This helps avoid significant impact to traffic operations.



Coordination with other Transit Planning

How would a streetcar be coordinated with the streetcar planning effort underway along Columbia Pike?

- Arlington/Fairfax Counties are currently analyzing alternatives that extend the Columbia Pike streetcar to the NVCC campus.
- Alexandria has expressed its interest in having the Columbia Pike streetcar extended to NVCC regardless of the location of its maintenance facility.
- The Alternatives Analysis / Environmental Assessment (AA/EA) will be complete in late 2011.
- If the recommendation does not extend the streetcar to NVCC, and the recommendation for Corridor C includes a streetcar, the City would need to examine a connection to the Skyline area as part of its Corridor C AA and NEPA document.



Recommendation by CWG for Corridor C May 19 CWG Meeting

"Alternative D is the preferred alternative for phased implementation of transit in dedicated lanes in Corridor C until such time as Alternative G becomes feasible and can be implemented. This course of action is consistent with the Council's recent decision to provide dedicated transit lanes along the segment of Corridor A that is north of Braddock Road. Evaluation and analysis will continue for Alternative D in preparation for future implementation of Alternative G. **Construction of transit in Corridor C shall be the first priority of Alexandria's transportation projects.** Each subsequent corridor shall be evaluated separately regarding the need to acquire additional right-of-way for dedicated lanes as discussed in the Transportation Master Plan."



Next Steps

- Formal Council Recommendation (Corridor C) – September, 2011
- Initiate Additional Studies
 - Alternatives Analysis and NEPA document consistent with Federal Transit Administration requirements
 - Public participation process
 - Identification of the preferred alternative
- Preliminary Engineering
- Right-of-Way Acquisition
- Final Design
- Service Plan
- Construction and Operation



THANK YOU!

DISCUSSION & COMMENTS

