Designing Bus Rapid Transit in Built Environments

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County of Fairfax, Virginia

**Agenda**

- Project Location
- Background
- Richmond Highway Projects
- Richmond Highway BRT
- Implementing BRT & Lessons Learned
- Richmond Highway BRT Design Challenges
- Schedule & Funding
PROJECT LOCATION

Richmond Highway Bus Rapid Transit
County of Fairfax, Virginia

Project Location
BACKGROUND

Richmond Highway Bus Rapid Transit
Route 1 Multimodal Alternatives Analysis

- Conducted by the Virginia Department of Rail and Public Transportation (DRPT)
- Studied 15-mile segment of Richmond Highway in Prince William and Fairfax Counties
- Alternatives Alignment for NEPA
- Study completed in January 2015
- Final recommendation
  - Near-term: Median-running BRT
  - Long-term: Metrorail extension to Hybla Valley & BRT
  - Assumes Richmond Highway has consistent 6-lane cross-section
What is Bus Rapid Transit (BRT)?

- **Key elements of BRT:**
  - Frequent, efficient service
  - Dedicated lanes with signal priority: early green and extended
  - Information technology systems
  - Rail-style stations
  - High-quality buses
  - Unique graphics and branding
County of Fairfax, Virginia

Where else is BRT?

Virginia

Existing:
- Alexandria / Arlington (Metroway)

Completed (2018):
- Richmond (GRTC Pulse)

Planned:
- Fairfax County (Richmond Highway BRT)
- Route 7 Tysons to Alexandria
Fairfax County Comprehensive Plan Amendment

- Corridor-wide planning goals and objectives with an urban design vision and land use changes to support of BRT
- Adopted March 20, 2018
- Guidance for creating transit-oriented places
- Implementation through the rezoning and development process

* Potential BRT Station
Richmond Highway Projects

Richmond Highway Bus Rapid Transit

FCDOT
Serving Fairfax County for 25 Years and More
US Route 1 Project

- Administered by FHWA
- Design Build Procurement
- Widening from 4 lane to 6 lanes from Telegraph Road to Mount Vernon Highway – 3.6 miles
- Included multipurpose trail and sidewalks
- Construction began in 2013 and opened to traffic in June 2017
- Reserved space in the median for BRT
- One BRT station located in this section
Richmond Highway Corridor Improvements

- Environmental Document underway
  - Design Public Hearing held in March 2019
- Widening from four lanes to six lanes from Jeff Todd Way to Napper Road (2.9 miles)
- Reserves space in the median for BRT and two BRT Stations
- Includes multimodal improvements in alignment with the Fairfax County Comprehensive Plan Update
- Will accommodate future drainage for BRT
- Three structures within this section (does not include BRT structures)
- Currently planned for a Design - Bid - Build Procurement in 2023
- Current Cost Estimate is $372M, partially funded
Richmond Highway Corridor Improvements

- Additional lane each direction, one-way cycle tracks, sidewalks, and BRT accommodations.
- Median reservation for BRT.
- Construction anticipated for 2023-2025.

The intent of this graphic is to depict the configuration of elements within the proposed right-of-way. For clarity, potential landscaping is not shown.
Richmond Highway BRT

Richmond Highway Bus Rapid Transit
Richmond Highway BRT Project

- **Recommendation:**
  - Richmond Highway Bus Rapid Transit (BRT) from Huntington Metrorail Station to Fort Belvoir.
  - Nine BRT stations.

- **Phasing:**
  - Phase I: Huntington Station to Hybla Valley
  - Phase II: Hybla Valley to Fort Belvoir
  - Long-term: Metrorail extension to Hybla Valley with BRT
Richmond Highway BRT Improvements

- Two dedicated BRT lanes in median.
- Roadway widening (no increase in number of through lanes).
- Future connections to walkways, trails, and bicycle facilities.
- Streetscape, including stations, walkways, and medians:
  - Street furniture, including bikeshare stations
  - Pedestrian lighting (facial recognition)
Richmond Highway BRT Improvements
Implementing BRT & Lessons Learned

Richmond Highway Bus Rapid Transit
Richmond Highway BRT Project Team

- Project led by FCDOT
- Supported by Project Management Consultant (PMC)
- DOT Director: Tom Biesiadny
- Senior Leadership: Eric Teitelman
- Project Manager: Vanessa Aguayo
- Project Advisor: Tom Fahrney
- Environmental Specialist: Doug Miller
- PMC: Joint Venture of RK&K and STV
  - Program Manager: Lara Hegler
# NATIONAL AND LOCAL BRT EXPERTISE

## SIMILAR PROJECT EXAMPLES

<table>
<thead>
<tr>
<th>Number</th>
<th>Project Name</th>
<th>Categories of Work</th>
<th>Scope of Services</th>
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<tr>
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Virginia BRT Design/Build Project Experience

• GRTC’s Pulse BRT

• City of Alexandria Metroway BRT
GRTC Pulse

- Retrofit Project
- Downtown Richmond
- Narrow lanes
- On-street parking
- Commercial entrances
GRTC Challenges

- Retrofit Project and Level Boarding
  - Matching existing geometry of the roadway and conflicts
GRTC Challenges

- Unknown Utilities
  - Verizon Vault
  - Main Street Station
City of Alexandria’s Metroway

- Award-winning project
- Pavement differentiation
- High voltage line not identified in preliminary design
- Stormwater management
- Turning movements & transitions at both ends
City of Alexandria’s Metroway

• Design criteria:
  – Typical sections
  – Turning movements
  – Transitions at beginning & end of BRT
  – Station size

• Special paving treatments
City of Alexandria’s Metroway

- **Challenges:**
  - Access management
    - Closed intersections
    - Provided fire/EMS crossing access
City of Alexandria’s Metroway

• Challenges:
  – Utilities
    • High voltage power line (underground)
    • Signal upgrades
    • ITS priority/preemption
Richmond Highway BRT Design Challenges

Richmond Highway Bus Rapid Transit
Design Criteria and Guidance

• Federal, State and County Requirements
• Developed Best Practices and Project Design Criteria using multiple sources
Design Challenges

• Posted speed limit of 45 MPH: Urban Principal Arterial

• Wide Typical Section (178’)

• Conflicts and Space Requirements
Design Challenges

- **Coordination with VDOT**
  - Construction on VDOT project will overlap with BRT Phase I construction; will impact MOT phasing
  - Signal design for BRT system will need to be coordinated with existing VDOT maintained signals
  - Incorporating BRT stormwater requirements on existing VDOT maintained stormwater system
  - BRT bridges will need to be coordinated with the adjacent VDOT project
Challenges and future considerations

- **Coordination with Future Land Use**
  - FC Office of Community Revitalization (OCR) and FC Department of Planning and Zoning (DPZ) will be encouraging development and redevelopment
    - Accommodations will be needed for the future grid of streets
  - Connecting Communities with additional walkways, trails, bicycle/scooter facilities to BRT
    - Adjacent projects funded by others
    - Developer proffers

- **Coordination with Richmond Hwy Urban Design Standards**
  - Under development
  - Influences Station Design/Station Area
Design Considerations

• Coordination with Other Stakeholders
  - FTA
    • Apply for Entry into Project Development
    • Apply for Grant funding
  - Fort Belvoir
    • New BRT station on Ft. Belvoir property
    • Shuttle onto Ft. Belvoir may be needed
  - WMATA
    • BRT Station at Huntington Metro Station
    • New WMATA Joint Development planned at Huntington Station
  - Richmond Highway Neighborhoods
    • Keeping community engaged
Public Outreach

RICHMOND HIGHWAY
Bus Rapid Transit (BRT)

While the Richmond Highway BRT system has not yet been designed, key elements of BRT systems will likely include those shown on the graphic below.

1. Exclusive BRT transitway
2. Articulated BRT buses
3. Real-time bus tracking
4. Off-board fare collection
5. Near-level boarding platforms
6. High visibility crosswalks
7. ADA accessible boarding
8. Enhanced bicycling and walking connections

This graphic is provided for illustrative purposes only and does not represent a proposed station design.
Schedule and Funding

Richmond Highway Bus Rapid Transit
## Funding Commitment for BRT

<table>
<thead>
<tr>
<th>Cost Estimate (M)</th>
<th>Programmed Funding (M)</th>
<th>Funding Gap &amp; Proposed Sources</th>
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*Cost based on an approximate 5-10% design (currently where the project is) and are still subject to change and refinement as more engineering/design is completed.*
County of Fairfax, Virginia

Note: Time frames and durations for Detailed/Final design, utilities, right-of-way and construction are subject to further refinement.

For Reference: Richmond Highway Corridor Improvements (VDOT Widening) Schedule

- NEPA Studies: 1. Draft Environmental Assessment, 2. FHWA Finding of No Significant Impact expected
- Detailed / Final Design
- ROW Acquisition and Utility Relocation
- Construction

Note: Time frames and durations for Detailed/Final design, utilities, right-of-way and construction are subject to further refinement.
Questions?