Purpose of the Project

• Improve the mobility of transit users
• Develop a more efficient transit system
• Support existing transit-oriented land use
• Support plans to generate new transit oriented development
• Provide an attractive alternative for east-west travel
Project Description

The Bus Rapid Transit Project, sponsored by GRTC Transit System, is primarily in the City of Richmond with a guideway of dedicated median and curbside bus lanes, with mixed-flow traffic, extending from Willow Lawn in Henrico County to Rocketts Landing.
Service Route: 7.6 Miles

- 14 Station Locations (5 Median, 9 Curbside)
  - 3.2 Miles of Dedicated Bus-Only Lanes
Pulse Service

• Minimum Hours of Operation:
  • Weekdays: 5:30 AM – 11:30 PM
  • Weekends: 6:00 AM – 11:30 PM

• Service Frequency:
  • Every 10 Minutes On-Peak
    (7:00 AM – 9:00 AM and 4:00 PM – 6:00 PM)
  • Every 15 Minutes Off-Peak

• Projected Line Travel Time: 29 to 31 Minutes

• Fare: Same As Local Fare (Currently $1.50)

• Estimated Daily Ridership: 3,500
Project Funding $49.8 Million

(Additional $4 Million Was Used During Preliminary Engineering Phase)

Funding Contribution

- FTA / USDOT: $24,900,000 (50%)
- DRPT: $16,900,000 (34%)
- City of Richmond: $7,600,000 (15%)
- Henrico County: $400,000 (1%)

TIGER Grant – Transportation Investment Generating Economic Recovery
Where We Are Now

• Semi-Final Design Phase Underway

• VDOT Is Project Manager
  ▪ Administers project on behalf of GRTC & partners
  ▪ Performs semi-final & final design
  ▪ Manages construction process: Design-Build
    • Develops & awards contracts
    • Efficient process
    • Provides cost-savings for the project
  ▪ Actively participates in public engagement
Why Design-Build?

• Provides cost-savings
• Mitigates risks
  ▪ Utility work
  ▪ Right-of-way work
• Improves construction efficiency
  ▪ Shorter duration of impact
DB Construction Preview

- Who: Team of Contractors
  - Designers and Builders

- What: Completes Remaining Design Work & Starts Construction

- When: Primarily Summer 2016 – Summer 2017
Construction Timeline

- Early Construction Activities Begin: March 2016
- Construction Complete: August 2017
- Pulse Operations Begin: October 2017
UDC/PC Comments & Responses

• Technical responses to comments & recommendations.
• In order as noted.
Q1: Median-Running Downtown

• Response: Not Recommended
Investigated Median-Running Downtown (N. Foushee St to N. 9th St)

Two bus lanes Downtown increases general traffic congestion.
Investigated Median-Running Downtown (N. Foushee St to N. 9th St)

- Increased Construction Cost: Approximately $1.8 Million more.
- Downtown Richmond has highest concentration of GRTC’s connections between bus routes.
- High vehicular traffic volume in corridor here.
- Want pedestrian cycle length of 90 seconds.
- Loss in left-turn locations.
- Loss in existing median landscaping.
- No negative impact for Future Light-Rail in median.
Q2: Investigate Governor Street

• Response: Not Granted Access
Investigated Utilizing Governor Street To Make Connection To E. Main Street.

- Commonwealth does not grant access onto Governor St. for safety and security reasons.
Q3 (Q6, Q7, Q23): Parking & Left-Turns

• Response:
  - Left-Turn: WB at Boulevard Recommended
  - Curb Cuts: Inventoried Options
  - Off-Broad Parking Inventory & New Options
  - East End Inventory
  - Sidewalk Buffer Where Parking Removed
  - Scott’s Addition
Studied Opportunities To Provide Additional Left-Turns From Broad St

- City Traffic Engineer Studied These Requested Turns:
  - EB at Summit St – not recommended
    - Station cannot be relocated due to an adjacent high pressure gas line running beneath Broad St.
    - City Traffic Engineer reviewing Scott’s Addition circulation.
  - WB at Boulevard – recommended, except during peak.
    - Loss of approximately 13 parking spaces
  - WB at Lombardy St – not recommended
    - Broad St widening on one side at a cost of approximately $200,000.
    - Reduction of existing sidewalk width by 3-4 feet.
    - Causes poor traffic operations in the short block between Lombardy Street and Bowe Street. More vehicles turning onto Bowe than Lombardy.
Examined Closing/Narrowing Curb Cuts To Allow For More Parking

• Inventoried where unused, redundant, &/or unnecessarily wide curb cuts exist.
  - EB Broad St between Mulberry St & Robinson St
  - EB Broad St between DMV Drive & Strawberry St
  - EB Broad St between Alison St & Meadow St/Hermitage Rd
  - WB Lombardy St to Allen St
  - EB Broad St between Belvidere St & Henry St
Pine Street Conversion SB

- City of Richmond will convert Pine St to a one-way southbound to add another 10 to 12 parking spaces. (6 parking + 3 loading today).
VCU will offer the following for public parking:

- **WBSD, 1111 West Broad St** - 30 spaces
- **HH Lot, 928 West Grace St** - 20 spaces
- **BB Lot, 925 West Grace St** - 25 spaces
- **HB Lot, 1201 West Broad St** - 27 spaces
- **SC Lot, 411 West Broad St** - 26 spaces
VCU helping mitigate loss of on-Broad St parking between Harrison & Pine Streets
# East End Parking Plan

<table>
<thead>
<tr>
<th>Subarea</th>
<th>Existing Parking Spaces</th>
<th>Proposed Change in Number of Spaces</th>
<th>Preserved Parking Spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>14th Street from Broad Street to Main Street</td>
<td>42</td>
<td>0</td>
<td>42</td>
</tr>
<tr>
<td>Main Street from 14th Street to Williamsburg Avenue</td>
<td>193</td>
<td>-20</td>
<td>173</td>
</tr>
<tr>
<td>Main Street from Williamsburg Avenue to Orleans Street</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Old Main Street from Main Street to Orleans Street</td>
<td>32</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td>Orleans Street from Old Main Street to Main Street</td>
<td>17</td>
<td>-10</td>
<td>7</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>284</strong></td>
<td><strong>-30</strong></td>
<td><strong>254</strong></td>
</tr>
</tbody>
</table>
Enhance Pedestrian Streetscape

- City of Richmond will address buffer areas through separate streetscape projects.
- Inventory of streetscape trees already in place where parking is proposed to be removed.
Q4: Station Dimensions, Materials & Finishes

• **Response: Accepted**
  - Bridging documents are being prepared for the DB procurement process.
  - DB Team will receive these instructions for compliance.
Q5: Station Locations

• Response: Documentation showing station locations that are adjacent to businesses/buildings.
Staples Mill EB Station

Asphalt Surface

STAPLES MILL - EAST

Asphalt Drive

Enterprise
1 Sty. Masonry
#4715

Title Max
1 Sty. Brick
#4711

Asphalt Parking Lot

Page 3 of 26
Cleveland WB Station

Page 5 of 26
Robinson EB Station

Science Museum of VA Parking Lot

Commercial Storefronts

Gus' Bar & Grill

Lalo's Cocina Bar and Grill

Page 6 of 26
Robinson WB Station

SCIENCE MUSEUM OF VA PARKING LOT

PARKING LOT

BANK OF AMERICA

ROBINSON WEST

BUS

NO TRESSPASSING

Page 7 of 26
Allison EB Station

PLEASANTS HARDWARE PARKING LOT

ALLISON = EAST

RENAISSANCE HAIR SALON  SAVORY GRAIN  ALLEY/PARKING  COMMERCIAL STOREFRONTS

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Shafer WB Station
Adams WB Station
3rd/4th Street WB Station
3rd/4th Street EB Station
9th Street WB Station
12th Street EB Station
Main Street WB Station
Main Street EB Station

[Diagram of Main Street Station - East]

[Images of Main Street Station during daytime and nighttime]
24th Street EB Station

- 24TH STREET - EAST
- RETAINING WALL
- APARTMENT BUILDING PARKING LOT

Page 23 of 26
Route 5 WB Station
Rocketts Landing Station
Q8: Tree Survey - Location, Size & Species

- Response: Accepted
- Mr. Luke McCall, City Arborist
Q9: Deciduous, Shade Producing Trees

- Response: Recommended
  - Coordinate with Urban Forestry to specify trees.
  - Mr. Luke McCall, City Arborist
Q10: Signage

- Response: Accepted
  - Signage in accordance with Manual on Uniform Traffic Control Devices (MUTCD) guidelines.
  - Signage in accordance with City wayfinding signage program.
  - Signage in accordance with GRTC signage program.
Q11: Lighting Plan

- Response: Accepted
  - LED lighting
  - Color Temperature: 3000K
Interior View

Track Up-lighting
Q12 (Q20): Consolidated Stations

• Project Requirement
  ▪ Four Proposed Consolidated Stations
    • Willow Lawn Drive
    • 9th Street
    • 12th Street
    • 24th Street

• East End Connectivity

• Comprehensive Operations Analysis (COA)
  ▪ City & GRTC will conduct a COA for system-wide recommendations
Routes Connecting Into BRT

Figure 2  Daily Peak Ridership by Stop with Transfer Volumes To/From the Route 6

GRTC Weekday Peak Ridership Activity on BRT Route
- Circle size indicates total activity (ONs + OFFs)
- GRTC stop locations
- BRT Route Alternative
- Half-Mile Buffer

Daily Transfers To/From Rt 6
- 0
- 10
- 100

Data Source: Ridership activity from GRTC automated passenger counters. Transfer data collected October 2015.
Proposed Consolidated Stations

- Willow Lawn
Proposed Consolidated Stations

- 9th Street
Proposed Consolidated Stations

- 12th Street
Proposed Consolidated Stations

- 24th Street
GRTC Local Bus Routes Study

- Study is on-going. First draft almost ready.
- City of Richmond refining the scope of work.
  - Ladders of Opportunity Grant – East End
  - Routes 52-53: connection to Pulse
  - 4 consolidated stations
- Expected release date: Early 2016.
Q13: Plant Palette

- Response: Accepted
  - Coordinate with Public Works Urban Forestry Division & Specified to DB Team
    - Ensure drought tolerant and native species trees
Q14: Alternate Design Walk-Through Station

- Response: Accepted
  - More walk-through space
    - Wider Ramps
      - Slope less than 5%, eliminating need for handrails
    - Smaller Landscaped Wedges
    - Smaller Width of Brick Knee Walls
30% Design vs. Semi-Final Design

30% DESIGN

OPTION Z DESIGN
Q15: Totem Pole Size

• Response: Reduction not recommended
  ▪ Front station view
    • 1 foot 8 inches in width
  ▪ Approaching station
    • 2 feet 8 inches wide
  ▪ Department of Historic Resources found no adverse effects
Robinson Eastbound (Day)
Q16: Up-lighting

- Response: Accepted
Station Up-lighting
Q17: Reduce Mass of Station Roof

- Response: Recommended
  - Reduction from 1’-10” to 1’-6” (20% reduction)
  - Changes incorporated into technical documents for Design-Builder.
Station Design Update

Old: 1'-10" Roof
New: 1'-6" Roof
Q18: High Capacity Bike Racks

• Response: Accepted
  ▪ 52 dual bike racks
  ▪ 6 additional quad bike racks (station locations to be determined)
  ▪ On-bus increased storage (front & interior being explored)
  ▪ Sidewalk bike storage will go through City review process.
Q19: Bike Share locations & BRT Stations

• Response: Accepted
  ▪ City of Richmond bike-share locations will be positioned at/near Pulse stations
Q21: 10’ Vehicular Lane Width

• Response: Accepted
  ▪ 10 foot vehicular lanes maintained
    • Exceptions include:
      – Local Bus Lane
      – BRT lane
  ▪ Curb & median BRT lanes
    • 11 foot lanes
10’ Vehicular Lane Width

(a) Sheppard to Foushee – Proposed Typical

(b) Sheppard to Foushee – Left Turns
Q22: Adaptive Technology

• Response: Not Recommended Now
  ▪ Current available transit and traffic technology not available yet where adaptive left-turn phasing can be safely implemented with median-running BRT operations.
  ▪ Flashing Yellow Arrow (FYA) signal indications could be installed.
    • FYA could operate when BRT buses are not.
    • Concern: more FYA left-turns could increase BRT travel time.
ARRIVING OCTOBER 2017!