INTRODUCED: December 14, 2015

AN ORDINANCE No. 2015-263

To authorize the Chief Administrative Officer, for and on behalf of the City of Richmond, to execute a Broad Street Bus Rapid Transit Project Development Agreement between the City of Richmond, the Greater Richmond Transit Co., the Virginia Department of Rail and Public Transportation, the Virginia Department of Transportation, and the County of Henrico to facilitate the implementation of the Broad Street Bus Rapid Transit project and to set forth the responsibilities of the parties.

Patron – Mayor Jones

Approved as to form and legality
by the City Attorney

PUBLIC HEARING: JAN 25 2016 AT 6 P.M.

THE CITY OF RICHMOND HEREBY ORDAINS:

§ 1. That the Chief Administrative Officer, for and on behalf of the City of Richmond, be and is hereby authorized to execute the Broad Street Bus Rapid Transit Project Development Agreement between the City of Richmond, the Greater Richmond Transit Co., the Virginia Department of Rail and Public Transportation, the Virginia Department of Transportation, and the County of Henrico to facilitate the implementation of the Broad Street Bus Rapid Transit project and to set forth the responsibilities of the parties. The Development Agreement shall be

| | | | | | |
|---|---|---|---|---|---|
| AYES: | 7 | NOES: | 1 | ABSTAIN: | 1 |
| ADOPTED: | FEB 8 2016 | REJECTED: | | STRICKEN: | |

approved as to form by the City Attorney and shall be substantially in the form of the document attached to this ordinance.

§ 2. This ordinance shall be in force and effect upon adoption.

4-4452

O & R REQUEST

NOV 19 2015

Chief Administration Office
City of Richmond

# CITY OF RICHMOND

## INTRACITY CORRESPONDENCE

**O&R REQUEST**

**DATE:** November 18, 2015 **EDITION:** 1

**TO:** The Honorable Members of City Council

**THROUGH:** Dwight C. Jones, Mayor

**THROUGH:** Selena Cuffee-Glenn, Chief Administrative Officer

**THROUGH:** John Buturla, Interim Deputy Chief Administrative Officer

**THROUGH:** Lee Downey, Interim Deputy Chief Administrative Officer

**FROM:** Amy Inman, Department of Economic and Community Development

DEC 10 2015

ATTORNEY

**SUBJECT:** **TO AUTHORIZE THE CHIEF ADMINISTRATIVE OFFICER TO EXECUTE A DEVELOPMENT AGREEMENT FOR THE BROAD STREET BUS RAPID TRANSIT PROJECT**

**ORD. OR RES. No.** _____

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**PURPOSE:** To authorize the Chief Administrative Officer to execute a development agreement between the City and the other project partners (the "Agreement") to facilitate the implementation of the Broad Street Bus Rapid Transit system ("BRT"). The other project partners are the Greater Richmond Transit Company ("GRTC"), the Commonwealth of Virginia (through its Department of Public Rail and Transportation) ("DRPT"), the Virginia Department of Transportation ("VDOT"), and Henrico County ("Henrico").

**REASON:** The Agreement facilitates the implementation of the BRT and sets forth the responsibilities of the project partners. The BRT will serve a 7.6 mile long corridor which connects greater Richmond to growth areas by providing increased access to major educational institutions, and numerous community facilities. The project will support the land use vision of the Adopted Richmond Downtown Master Plan by encouraging mixed-use and transit-oriented development. The Broad Street BRT "Pulse" will provide reduced travel time for existing riders

by 33%, support revitalization of economically distressed areas by spurring reuse and redevelopment of underutilized properties and provide access to major retail centers and social services.

**RECOMMENDATION:** Approval is recommended by the City Administration.

**BACKGROUND:**
The 7.6 mile long Broad Street Bus Rapid Transit (BRT), the "Pulse," project is a result of decades of local and regional planning. Beginning in 2003, the Richmond Metropolitan Planning Organization (MPO) began to plan for a region-wide rapid transit system that identified corridors for preliminary analysis and screening, including the Broad Street Corridor. In 2008, GRTC conducted a Comprehensive Operational Analysis (COA) that examined its current operating system and provided recommendations to improve future public transportation services, including the advancement of a BRT system along Broad Street in two phases. In 2009, the Department of Rail and Public Transportation (DRPT) and GRTC advanced the Broad Street BRT into the Federal Transit Administration (FTA) "Small Starts" Alternatives Analysis and Environmental Assessment planning and environmental process. Willow Lawn and Rocketts Landing were identified as the two end points of the BRT corridor, as they serve as key destination points that provided access to retail and residential mixed use developments that anchor the east and west ends of the corridor.

The BRT will improve transit service, increase livability, enhance economic opportunity, revitalize commercial properties, reduce travel times for existing riders by approximately 33%, improve the reliability of transit operations on Broad Street, expand the range of access to jobs for transit users, create additional opportunities to increase system-wide efficiency for GRTC, and further improve service on local transit routes.

Extensive public involvement has been the hallmark of the Broad Street BRT project, with numerous public and stakeholder meetings being held from 2009 to present. Business and Neighborhood Associations, including the Downtown Neighborhood Association and Shockoe Bottom Neighborhood Association were engaged early and often throughout the Alternatives Analysis and Environmental Assessment. Public and community involvement has continued throughout the Preliminary Engineering (PE) and Design phase of project development. Over 50 public and community stakeholder meetings have been held in 2015 alone. Additionally, since May of 2015, the City of Richmond's Chief Administrative Officer (CAO) has held individual meetings with stakeholder and community groups, including the leadership from the RVA Coalition for Smart Transit, who represents numerous associations, such as the Fan District Association and the West Grace Street Association. Representatives from Scotts Addition, business owners along Broad Street, and Urban Design Commission (UDC) have also attended regular project status meetings with the CAO and City staff. The project team has been available at all times to receive meaningful input and comments from stakeholders, provide information and answer questions related to the BRT project.

In 2014, the FTA and the State Historic and Preservation Office (SHPO) reviewed the Environmental Assessment documentation and determined that the project would have no adverse effects. The FTA granted a documented Categorical Exclusion (CE) and cleared the

corridor for construction and implementation of the Broad Street BRT. In September 2014, the United States Department of Transportation (USDOT) awarded the project a $24.9M grant from the Transportation Investment Generating Economic Recovery (TIGER) program. This TIGER grant provides 50% of the capital funding required to construct the BRT project. The remainder of the project capital funds will be received from the Department of Rail and Public Transportation (DRPT) $16.9M (34%), City of Richmond $7.6M (15%), Henrico County $400K (1%).

On September 15, 2015, GRTC signed and fully executed the $24.9M TIGER grant agreement with the USDOT. In June 2015, the Commonwealth Transportation Board (CTB) approved DRPT's Six-Year Improvement Program (SYIP), which authorizes $16.9M of DRPT's share of the project funding. On May 15, 2015, the City Council adopted the City of Richmond's FY 2016 – FY 2020 Capital Improvement Program (CIP), which budgeted the City's $7.6M share of the project funding in FY16 and FY17, which is consistent with the project construction schedule that was presented and adopted in the CIP BRT project description, see attachment. Henrico County has allocated $400K to the project, which represents 1% of the project budget.

In August 2014, the Richmond Transportation Planning Organization (TPO) adopted the fully funded Broad Street BRT into the Region's fiscally Constrained Long Range Transportation Plan (CLRTP). On November 5, 2015, the City of Richmond Urban Design Commission (UDC) unanimously approved the recommendation the 60% design to the City's Planning Commission (PC). On November 16, 2015, the City of Richmond Planning Commission unanimously approved the BRT 60% design with conditions to return to the UDC and PC with information regarding tree planting and landscape design.

**FISCAL IMPACT TO CITY/COST:** $7.6M funding has already been approved in the FY16 – FY20 Capital Improvement Program (CIP).

**FISCAL IMPLICATIONS:** FY16 $3.8M and FY17 $3.8M

**REVENUE TO THE CITY:** N/A

**DESIRED EFFECTIVE DATE:** Upon Adoption.

**REQUESTED INTRODUCTION DATE:** December 14, 2015

**CITY COUNCIL PUBLIC HEARING:** January 11, 2015

**REQUESTED AGENDA:** Consent Agenda

**RECOMMENDED COUNCIL COMMITTEE:** Land Use, Housing and Transportation Committee

**CONSIDERATION BY OTHER GOVERNMENTAL ENTITIES:** Commonwealth of Virginia Department of Rail and Public Transportation (DRPT), Virginia Department of Transportation (VDOT), Henrico County, and GRTC.

**AFFECTED AGENCIES:** Economic and Community Development, Public Works, Public Utilities, Planning and Development Review, Law Department

**RELATIONSHIP TO EXISTING ORD. OR RES: None**

**REQUIRED CHANGES TO WORK PROGRAM (S):** None

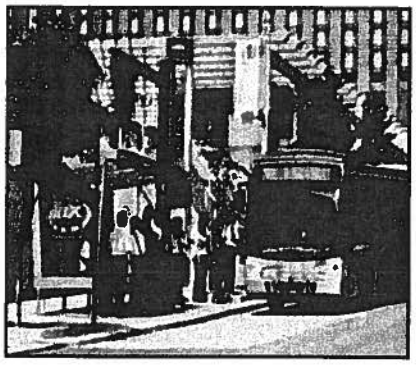
**ATTACHMENTS:** Broad Street Bus Rapid Transit Project Development Agreement

**STAFF:** Amy Inman, John Buturla, Lee Downey

# GRTC Bus Rapid Transit Project

**Category:** Transportation
**Focus Area:** Transportation; Economic growth
**Location:** Citywide
**Est. Completion Date:** FY 2017

**Department:** GRTC, ECD Public Works
**Service:** Infrastructure management
**Fund:** 0601
**Award #:** New



**Description & Scope:** The Federal Transit Administration (FTA), as the lead federal agency, and GRTC Transit System (GRTC) as the project sponsor, with support from the USDOT Tiger Discretionary Grant Program ($24.9 Million), the Virginia Department of Rail and Public Transportation ($16.9 Million), the City of Richmond ($7.6 Million) and the County of Henrico ($400 Thousand) to construct a Bus Rapid Transit System (BRT) along a 7.6 mile segment of Broad Street and Main Street in Richmond, VA. The GRTC BRT will become a high quality, high capacity rapid transit system that offers many of the advantages of rail but at a more affordable cost.

**Purpose:** In September 2014, GRTC was awarded a Transportation Investment Generating Economic Recovery (TIGER) discretionary grant in the amount of $24.9 Million (or 50% of the estimated construction cost) for the purpose of constructing the GRTC BRT. The TIGER grant requires local government support. The City's match requirement totals $7.6 Million.

**History & Key Milestones:** Preliminary Engineering completed July 2015, 60% Final Design completed April 2016, Construction begins May 2016 and completed by October 2017

## Financial Summary

| | FY 2015 | FY 2016 | FY 2017 | FY 2018 | FY 2019 | FY 2020 | Total FY 2016-2020 |
|---|---|---|---|---|---|---|---|
| **FY 2016 Adopted** | N/A | 3,800,000 | 3,800,000 | - | - | - | **7,600,000** |
| **FY 2015 Adopted** | - | - | - | - | - | N/A | - |
| **Change** | N/A | 3,800,000 | 3,800,000 | - | - | - | **7,600,000** |

**Operating Impact** TBD

| | |
|---|---|
| **Total Project Cost** | **7,600,000** |
| Prior Year Funding | - |
| Prior Year Available | - |
| FY 2016 Adopted | 3,800,000 |
| FY 2017 – FY 2020 Planned | 3,800,000 |
| **Remaining Need** | - |

| FY 2016 Budget Distribution | |
|---|---|
| | **Amount** |
| Planning/Design | - |
| Acquisition/Relocation | - |
| Site Improvements | - |
| Construction | 3,800,000 |
| Furniture/Fixtures/Equipment | - |
| Other | - |
| **Total** | **3,800,000** |

**Funding Source(s):** General Obligation Bonds

**Notes:**

# BROAD STREET BUS
# RAPID TRANSIT PROJECT
# DEVELOPMENT AGREEMENT
# BY AND AMONG
# GREATER RICHMOND TRANSIT CO.
# CITY OF RICHMOND, VIRGINIA
# HENRICO COUNTY, VIRGINIA
# VIRGINIA DEPARTMENT OF TRANSPORTATION
# AND
# VIRGINIA DEPARTMENT OF RAIL AND PUBLIC TRANSPORTATION

**_____, 201_**

# BROAD STREET BUS RAPID TRANSIT PROJECT DEVELOPMENT AGREEMENT

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**BROAD STREET BUS RAPID TRANSIT PROJECT**

**DEVELOPMENT AGREEMENT**

THIS BROAD STREET BUS RAPID TRANSIT PROJECT DEVELOPMENT AGREEMENT (the "Agreement") is made and entered into as of the __ day of _____, 201__ by and between the Greater Richmond Transit Co., a Virginia corporation ("GRTC"), the City of Richmond, Virginia, a municipal corporation of the Commonwealth of Virginia (the "City"), Henrico County, Virginia, a political subdivision of the Commonwealth of Virginia (the "County"), the Virginia Department of Transportation, an agency of the Commonwealth of Virginia ("VDOT"), and the Department of Rail and Public Transportation, an agency of the Commonwealth of Virginia ("DRPT").

WHEREAS, GRTC is the principal public transportation provider and transit-operator for the Richmond, Virginia urbanized area; and

WHEREAS, GRTC provides fixed-route, paratransit, and specialized transportation services to the City, the County, and express routes to other surrounding localities; and

WHEREAS, DRPT is the primary state level planning and funding agency for public transportation improvements in Virginia; and

WHEREAS, the City is part owner of GRTC and provides annual transit-operational funding for most GRTC routes; and

WHEREAS, the County is approximately 244 square miles in area and surrounds the City on three sides and provides operational funding for GRTC routes that serve both the east and west ends of the County; and

WHEREAS, GRTC, DRPT, the City, and the County (collectively, the "Project Partners") desire to cooperate in the development of the Broad Street Bus Rapid Transit ("Broad Street BRT") system, a 7.6 mile, $49.8 million Bus Rapid Transit service that will follow a route utilizing Broad Street and Main Street through the City and the County as shown in the Plan as defined herein (the "Project"); and

WHEREAS, the United States Department of Transportation ("USDOT") announced on September 12, 2014, that it intends to award a Transportation Investment Generating Economic Recovery ("TIGER") grant in the amount of $24.9 million (the "TIGER Grant") to GRTC as the Broad Street BRT Project Sponsor, and GRTC shall allocate the federal TIGER funds as described and defined in the TIGER Grant Application (as defined herein); and

WHEREAS, the Federal Transit Administration ("FTA") will administer the TIGER Grant on behalf of the USDOT; and

WHEREAS, the TIGER Grant provides 50 percent of the anticipated capital funding for the development and construction of the Project; and

WHEREAS, the Project Partners agree that GRTC should secure the grants and other capital funds needed for the Project, and, upon completion thereof, should be the transit-operator of the Broad Street BRT and provide maintenance of the Broad Street BRT; and

WHEREAS, the Project Partners and VDOT (collectively, the "Parties" and each a "Party") agree that VDOT should contract for and oversee the implementation of the contract for the Project, including the Design and Construction (each defined herein) of the Broad Street BRT, in accordance with the terms of this Agreement; and

WHEREAS, it is the intent of the Parties to establish the roles, duties, responsibilities, and rights of each party during the implementation of the Project of the Broad Street BRT; and

WHEREAS, the Project is being undertaken in the interest of public convenience and safety and will benefit the citizens and the economy of the City and the County.

NOW, THEREFORE, in consideration of the mutual terms, conditions, promises, covenants, and payments hereinafter set forth, the Parties agree as follows:

1. RECITALS.

The accuracy of the Recitals set forth above are acknowledged by the Parties and, along with the exhibits attached to this Agreement, are incorporated herein by reference.

2. DEFINITIONS.

2.1. "Available Capital Funds" shall mean the Total Capital Funds minus the Principal Contingency Fund.

2.2. "Betterments" shall mean improvements that are not shown on the Final Plan and that the Project Partners have determined are beyond the Project scope.

2.3. "Broad Street BRT" shall mean the 7.6 mile bus rapid transit system traversing in a primarily east-west direction along surface streets, primarily Broad Street, from Willow Lawn to Rocketts Landing, as more particularly shown on the Plan (and, after it is approved by the Executive Oversight Board, as the Final Plan) and any amendments thereto made in accordance with the terms of this Agreement.

2.4. "Capital Cost Overrun" shall mean all actual capital and administrative costs for goods or services included in the Final Plan which exceed the Total Capital Funds, and which are not due to a change in the scope of the Project.

2.5. "Construction" shall mean the construction activities necessary to complete the Project, including but not limited to those duties specifically delineated in this Agreement.

2.6. "Design" shall mean professional services, including, but not limited to, architectural, civil, operational, mechanical, transportation, electrical engineering,

environmental, and geotechnical services, necessary to complete the Final Plan and the Project.

2.7. Designated Project Partner Representatives" shall mean representatives from each Project Partner that shall carry out the duties described in Section 11.1.

2.8. "Executive Oversight Board" shall mean the board consisting of one representative of each Project Partner. The Board shall have the duties described in Section 12.3.

2.9. "Federal Grants" shall mean any current and future federal grants awarded by the USDOT for the Project, including the TIGER Grant.

2.10. "Federal Grant Agreements" shall mean the underlying agreement to any Federal Grant between the awarding federal agency and the grant recipient.

2.11. "Final Plan" shall mean the final Broad Street BRT plan as approved by the Executive Oversight Board in accordance with the terms of this Agreement.

2.12. "FTA" shall mean the Federal Transit Administration of the USDOT.

2.13. "Plan" shall mean the Broad Street BRT plan approved by the Planning Commission for the City of Richmond ("Planning Commission") on November 16, 2015, attached hereto as Exhibit A and incorporated herein by reference. The term "Plan" shall include the conditions of approval imposed by the Planning Commission.

2.14. "Principal Contingency Fund" shall mean a portion of the Total Capital Funds as set forth in this Agreement, which shall only be used for the completion of the Project upon the approval of the Executive Oversight Board.

2.15. "Project" shall mean the Planning, preliminary and final Design, Construction and other tasks necessary for the completion of the Broad Street BRT.

2.16. "Project Completion" shall mean the completion of all requirements of the Project in accordance with the Final Plan and the operational readiness of the Broad Street BRT. Project completion does not occur until the Executive Oversight Board approves project completion.

2.17. "TIGER Grant" shall mean the grant awarded by the USDOT and administered by the FTA under the Transportation Investment Generating Economic Recovery supplementary discretionary grant program included in the American Recovery and Reinvestment Act of 2009, to GRTC on September 13, 2014, in the amount of $24,900,000.

2.18. "TIGER Grant Agreement" shall mean the agreement between GRTC and FTA for the TIGER Grant fully executed as of September 14, 2015, including all Attachments and Exhibits thereto, attached hereto as Exhibit B and incorporated herein by reference.

2.19. "TIGER Grant Application Narrative" shall mean the project narrative included as a component of the TIGER Grant application transmitted to FTA on behalf of the Project Partners a copy of which is attached hereto as Exhibit C and incorporated herein by this reference.

2.20. "Total Capital Funds" shall mean the total funds committed by the Project Partners and the TIGER Grant for the completion of the Project. Total Capital Funds are exclusive of those costs associated with maintenance and operation of the Broad Street BRT upon Project Completion.

3. PURPOSE OF AGREEMENT.

The purpose of this Agreement is to outline the roles, responsibilities, and allocated funding for development of the Broad Street BRT and to provide a means by which Project Partners may provide approvals and disapprovals, where necessary, and express their opinions and concerns regarding the completion of the Project.

4. BROAD STREET BRT DESCRIPTION.

The Broad Street BRT will improve transit service, increase livability, enhance economic opportunity, revitalize commercial properties, improve environmental sustainability, and stimulate economic development in the City, the County and the greater Richmond, Virginia region. Starting from Rocketts Landing at the easternmost terminus of the system, the Broad Street BRT buses will connect major employment centers and primary activity centers and terminate at Willow Lawn to the west. The system is approximately 7.6 miles in length and will be served by 14 stations, as more fully described the TIGER Grant Application narrative and as further described in Section 2.3 of this Agreement.

5. FUNDS

5.1. The Total Capital Funds shall be $49,800,000, the sources of which are set forth in this section. The Project Partners acknowledge and agree that VDOT's ability to complete the Project is contingent upon GRTC receiving the following funds.

5.1.1. Federal Funds. $24,900,000 granted to GRTC for the Project pursuant to the terms of the TIGER Grant Agreement.

5.1.2. DRPT Funds. $16,900,000 granted to GRTC through the DRPT Capital Grant Funding Program pursuant to the terms of DRPT Grant Agreement 50017-01.

5.1.3. City Funds. $7,600,000 to be made available by City to GRTC as follows: $3,800,000 made available during City Fiscal Year 2016 and deposited into an account held by GRTC within 30 days after the execution of this Agreement and $3,800,000 made available during City Fiscal Year 2017 and deposited into an account held by GRTC within 30 days after the first day of the City Fiscal Year 2017.

5.1.4. County Funds. $400,000 to be made available by County to GRTC as follows: $200,000 made available during County Fiscal Year 2016 and deposited into an account held by GRTC within 30 days after the execution of this Agreement and $200,000 made available during County Fiscal Year 2017 and deposited into an account held by GRTC within 30 days after the first day of the County Fiscal Year 2017.

5.2. Principal Contingency Fund.

5.2.1. Ten percent of the Total Capital Funds ($4,980,000) shall be initially designated as the Principal Contingency Fund. Once the Final Plan is completed and approved by the Executive Oversight Board, the Principal Contingency Fund may decrease to five percent of the Total Capital Funds ($2,490,000).

5.2.2. Once the Final Plan is completed and the Construction is 50 percent complete, the Principal Contingency Fund may decrease to two percent of the Total Capital Funds ($996,000).

5.2.3. Once the Final Plan is completed and the Construction is ninety percent complete, the remaining funds in the Principal Contingency Fund may be released upon the approval of the Executive Oversight Board.

5.2.4. Neither the Principal Contingency Fund nor any portion thereof shall be utilized by or provided to VDOT unless approved by the Executive Oversight Board.

5.3. Available Capital Funds. The amount of the Available Capital Funds is the Total Capital Funds minus the Principal Contingency Fund. Subject to the fiscal year one limitations set forth in subsections 5.1.3 and 5.1.4, the Available Capital Funds may be utilized by the GRTC or VDOT without the approval of the Executive Oversight Board, except as specified in Section 5.2 of this Agreement.

5.4. Increase in Total Capital Funds.

5.4.1. VDOT may, but is under no obligation to, increase the Total Capital Funds by providing its own funding or, with the approval of the Project Partners, by securing funding from sources other than the Project Partners. VDOT may request additional funding, of up to $1,400,000 from the Commonwealth Transportation Board, which will be used solely to provide incentives, as described in Section 6.4.1.2 of this Agreement and will not otherwise increase the Total Capital Funds. Such incentive funding is subject to availability of appropriated funds and allocation by the Commonwealth Transportation Board.

5.5. The Project Partners are not obligated in any way to contribute funds to increase the Total Capital Funds; provided, however, that VDOT is not obligated to provide any Betterment unless the Project Partner or Partners requesting the Betterment provide the funds to increase the Total Capital Funds to cover the cost of the Betterment. The Project Partners may voluntarily provide funds to increase the Total Capital Funds; provided,

however, that any funds provided by the City and County must be appropriated by their respective governing bodies.

5.6. Surplus Funds. If Project Completion is achieved without utilizing all of the Total Capital Funds, then the remaining funds provided to GRTC, under this Agreement or any other related agreement, shall be returned to the appropriate Party in an amount equal to the pro-rata share of each applicable Party's contribution of funds.

5.7. Capital Cost Overruns. DRPT shall be responsible for any Capital Cost Overruns exceeding the Total Capital Funds, except those that are explicitly stated in this Agreement to be the responsibility of another Party, to the extent funds are appropriated and allocated as provided in this Agreement.

6. PROJECT MANAGER

6.1. General. In accordance with this Agreement, and without exceeding the Total Capital Funds, VDOT shall implement and complete the Project, including the Design, Construction, and other tasks necessary to achieve Project Completion.

6.2. Design. VDOT shall complete the Design and Final Plan of the Broad Street BRT. The Final Plan shall include the procurement, design, and installation of all vehicles and off-board fare collection infrastructure or ticket vending machines associated with the Project as provided by GRTC. The Executive Oversight Board must approve the Final Plan. Each member of the Executive Oversight Board shall either approve or disapprove any proposed final plan and state all reasons for disapproval within 10 days of receiving such plan from VDOT. The parties acknowledge that in the event that the Final Plan is inconsistent with the Plan, the City Charter for the City of Richmond may require further Location, Character and Extent approval by the City's Planning Commission, depending upon the scope of the inconsistencies.

6.2.1. If the estimated cost of implementing a proposed Final Plan exceeds the Total Capital Funds, VDOT shall provide the Executive Oversight Board an itemization of all costs included in the proposed final plan, along with VDOT's recommended alternative whose estimated cost does not exceed the Total Capital Funds. Under no circumstances shall the Executive Oversight Board approve a Final Plan which exceeds the Total Capital Funds unless the VDOT obtains additional funding.

6.3. Construction. VDOT shall complete the Construction of the Project in accordance with the approved Final Plan. The project shall not be deemed complete unless and until the Executive Oversight Board has determined that Project Completion has been achieved. VDOT shall make its best efforts to achieve Project Completion by October 31, 2017; however, failure to achieve Project Completion by that date shall not, in and of itself, be construed as a breach of this Agreement.

6.4. Non-exhaustive List of Duties. In completing the Design, Construction, and other tasks necessary for the completion of the Project, and in accordance with the approved Final Plan, VDOT shall:

6.4.1. Provide all necessary conceptualization, planning, design, engineering, contract administration, procurement, construction supervision, and administrative services for the Project. VDOT shall be solely responsible for the competitive selection, award, and administration of all professional and consultant services, and those construction contracts necessary for the completion of the Project. All contracts shall comply with the FTA Master Agreement and all applicable state and federal procurement laws , including, but not limited to: 49 C.F.R. pt. 18.36, 49 C.F.R.§ 200 et seq., 49 U.S.C. § 5301-5340, Pub. L. 105-178, FTA Cir. 4220.1F, FTA Cir. 5010.1D, and FTA Cir. 9030.1C.

6.4.1.1. VDOT may contract with third parties to provide those services necessary to design, implement or review the goods and services necessary to achieve Project Completion.

6.4.1.2. VDOT may, in any Request for Proposal or contract, include incentives that may, in VDOT's discretion, encourage the completion of the Project in a timely and cost effective manner. Such incentives may be in addition to the Total Capital Funds, provided the cost is paid as described in Section 5.4.1.

6.4.1.3. For procurements VDOT is conducting on the Project, GRTC will: a) be given the opportunity to review the procurement documents prepared by VDOT to ensure all required FTA clauses are included and required FTA procurement processes are being followed; b) promptly provide the necessary resources to conduct such reviews; c) receive and maintain copies of all executed contracts and procurement documents, to include, but not be limited to, price/cost analyses, so that GRTC can readily produce them should FTA request to audit the Project's procurement records; and d) be provided with a copy of all executed change orders issued by VDOT, including any request for change order documents, VDOT's independent cost estimates, and contractor's cost proposals.

6.4.2. Acquire all permits necessary to complete the Project. The costs of such permits shall be reimbursable in accordance with section 7.2 of this Agreement.

6.4.3. Not be responsible for the procurement and design of all vehicles and off-board fare collection infrastructure or ticket vending machines, validation equipment, and real-time bus arrival signs and related equipment associated with the operation of the Broad Street BRT. These excluded duties shall be the responsibility of the GRTC in accordance with section 7.6 of this Agreement.

6.4.4. Pay all fees necessary for the completion of the Project including, but not limited to, utility connection fees, communication installation fees, and all fees associated with the permitting and installation of the equipment and infrastructure for the Broad Street BRT that are not otherwise paid for by the owner

of such utilities, equipment and infrastructure. The payment of such fees shall be reimbursable in accordance with section 7.2 of this Agreement.

6.4.5. Ensure all plans and specifications for the Broad Street BRT comply with industry best practices, including without limitation reliability and maintainability, for all Project elements.

6.4.6. Provide or make available to each Project Partner, upon Project Completion, a complete set of full-sized reproducible record drawings and, if requested, electronic copies.

6.4.7. Retain and make available for audit all records and accounts related to the Project for all time periods required by any grant used for the Project, the Virginia Public Records Act, VDOT's applicable record retention schedule, and any other applicable law.

6.4.8. In accordance with the standards and requirements of the jurisdiction in which the utilities reside, ensure that all utility facilities, private and public, impacted by the Project are protected in place or timely removed, relocated, or otherwise adjusted, to the extent the Party in control of the right-of-way has not protected, removed, relocated or otherwise adjusted such utility facilities. This duty shall include the payment of any cost necessary to comply with this subsection. The payment of such costs shall be reimbursable in accordance with section 7.2 of this Agreement.

6.4.9. Provide to the Project Partners documentation of cultural, archeological, and paleontological resources encountered.

6.4.10. To the extent allowed under the TIGER Grant Agreement and all applicable laws, acquire those interests in real property, including resolution of all easements or other clouds on title to property owned or under the control of VDOT or any of the Project Partners at the time of this agreement, necessary for the completion of the Project. This duty shall include the payment of any cost for acquiring such real property interest which shall be reimbursed by GRTC in accordance with Section 7.2 of this Agreement. Any real property interests acquired by VDOT under this section shall be conveyed to the Party in control of the right-of-way prior to Project Completion.

6.4.11. Communicate, in good faith, with the Project Partners regarding the status of the Project including, but not limited to, providing such documents, updates, and information required elsewhere in this Agreement.

6.4.12. Ensure that the performance of the obligations hereunder is in accordance with the terms of the TIGER Grant, all other applicable FTA requirements, any other applicable grant, and all applicable state and federal laws.

6.4.13. Remediate any hazardous materials encountered during Construction. The costs of such remediation shall be reimbursed by GRTC in accordance with section 7.2 of this Agreement.

6.5. VDOT shall maintain the control of traffic operations and traffic signals within VDOT's jurisdiction and control, including those related to the Broad Street BRT, unless otherwise agreed to in writing by VDOT.

7. SPONSOR

7.1. Funds. GRTC will be the grant recipient of funds awarded under the TIGER Grant as well as all remaining Total Capital Funds and shall adhere to all local, state and federal laws and regulations associated with the use of such funding. Any payments for the capital costs of the Project will be consistent with the associated State and Federal Grant Agreements.

7.1.1. GRTC shall deposit and maintain funds provided by City and County (the "City Funds" and the "County Funds") in separate accounts, and shall not comingle those funds with any other funds during the Project. GRTC may use such funds to pay the City and County's respective proportionate share of costs to complete the Project as set forth in Section 7.2 of this Agreement and shall account for the use of those funds upon request from the City or County.

7.2. Payment. GRTC shall remit portions of the Available Capital Funds and, upon approval of the Executive Oversight Board, portions of the Principal Contingency Fund, to VDOT and the Project Partners as described in this section. All payments for costs incurred in relation to the Project shall be made from the funds provided in Sections 5.1.1 through 5.1.4 on a pro-rata basis in proportion to the amount of Total Capital Funds committed be each Party. GRTC shall not be obligated to remit any funds that exceed the Total Capital Funds. If VDOT or any Project Partner, as applicable, submits to GRTC an invoice for any matter(s) that are outside of the scope of the Final Plan, as determined by the Executive Oversight Board, then GRTC shall not be obligated to remit funds to the party presenting such invoice.

7.2.1. Upon receipt of proper invoices from contractors working on the Project, VDOT shall provide payment in compliance with applicable state and federal prompt payment requirements.

7.2.2. VDOT (or Project Partner, as applicable) shall send an invoice to GRTC monthly for payments made to contractors or for other reimbursable costs incurred for their work on the Project.

7.2.3. GRTC shall review all invoices and contact VDOT (or Project Partner, as applicable) within seven business days if GRTC requires additional supporting or corrected information.

7.2.4. If no changes to an invoice or supporting information are required, if GRTC shall seek reimbursement from the FTA or DRPT, as appropriate, within

seven business days of receipt of the invoice. If changes to the invoice or supporting information are necessary, GRTC shall seek reimbursement from the FTA or DRPT within seven business days of receipt of the revised invoice from VDOT (or Project Partner, as applicable).

7.2.4.1. GRTC shall seek Federal funds from the TIGER Grant award through the FTA online system, in accordance with the policies and procedures of the FTA.

7.2.4.2. GRTC shall send supporting documentation and a reimbursement request to DRPT in order to receive state funding committed by DRPT. This request for reimbursement shall follow the process GRTC typically uses in requesting funding from DRPT on other projects.

7.2.4.3. DRPT shall reimburse GRTC within 30 calendar days, in accordance with DRPT's normal operating procedure.

7.2.5. If no changes to the invoice or supporting information are required, GRTC shall process the portion of such reimbursement due from the City Funds and County Funds, as appropriate, within 30 business days of receipt of the invoice. If changes to the invoice or supporting information are necessary, GRTC shall process the portion of such reimbursement due from the City Funds and County Funds, as appropriate, within seven business days of receipt of the revised invoice from VDOT (or Project Partner, as applicable). GRTC shall document all transactions relating to such funds and shall make such documentation available to any Project Partner.

7.2.6. GRTC shall reimburse VDOT (or Project Partner, as applicable) for expenditures within three business days after the receipt of reimbursement funds from all funding sources and the processing of the City and County Funds as set forth in Section 7.2.5.

7.3. Grants. GRTC shall be responsible for ensuring completion of the Project complies with the requirements of the TIGER Grant Agreement and any other applicable grant agreement. This responsibility shall include making requests for amendment of the project schedule contained in the TIGER Grant Agreement and making any modifications to any documents that may be required pursuant to the National Environmental Policy Act of 1969, 42 U.S.C. § 4321 *et seq.* GRTC shall provide a primary point contact to VDOT, the FTA, and any other government agency to assist in complying with all of the grants.

7.4. Public Outreach. GRTC shall engage in all appropriate public outreach and solicit public input related to the Project and the Broad Street BRT.

7.5. Operation and Maintenance. GRTC shall operate and maintain the Broad Street BRT in accordance with any applicable provisions of this Agreement, all applicable laws, and any subsequent agreement between GRTC and the remaining Parties regarding the operation and maintenance of the Broad Street BRT. Notwithstanding the foregoing, the City, the County, and VDOT shall maintain control of their respective traffic operations

and traffic signals, including those related to the Broad Street BRT, unless otherwise agreed by the City, the County, or VDOT in writing.

7.6. GRTC shall be responsible for the procurement and design of all vehicles, off-board fare collection infrastructure and ticket vending machines, validation equipment, real-time bus arrival signs and related equipment associated with the Project or with the operation of the Broad Street BRT. GRTC shall provide to VDOT all information necessary to include such items in the proposed final plan submitted to the Executive Oversight Board. GRTC shall be the owner of all such items procured in accordance with this paragraph.

7.6.1. GRTC shall request and receive reimbursement for its activities performed under Section 7.6 of this Agreement, including its administrative costs for such activities, through the same process described in Section 7.2 of this Agreement.

7.7. Within 30 days of the execution of this Agreement, VDOT must submit a final invoice to DRPT for all Project costs incurred by VDOT prior to the date of this Agreement. Within 30 days of receipt of such final invoice from VDOT, DRPT shall submit a request for reimbursement to GRTC, for such costs incurred by VDOT prior to the execution of this Agreement that DRPT is responsible to pay to VDOT. Such reimbursement by GRTC shall be proportioned among the collected funds, except that GRTC shall not reimburse DRPT the portion of funds that would have been paid from DRPT funds under this Agreement.

8. CITY

8.1. Contribution of Funds. Subject to appropriation of the Council for the City of Richmond ("City Council"), the City shall make available to GRTC the City's portion of the Total Capital Funds as set forth in Section 5 of this Agreement.

8.2. Utilities. Notwithstanding section 6.4.8, the City may remove, replace, or otherwise protect certain utility facilities impacted by the Project upon approval by VDOT, the cost of which shall be reimbursed in accordance with Section 7.2 of this Agreement (such reimbursement shall include costs incurred prior to the execution of this Agreement).

8.3. Public Outreach. The City shall engage in all appropriate public outreach and solicit public input related to the Project and Broad Street BRT.

8.4. Review. The City acknowledges that time is of the essence regarding this Project and, subject to all legal requirements, the City agrees to work in good faith to review applications for permits and any other necessary authorizations for use of City right-of-way; or for any permits or approvals otherwise required for the completion of the Project. The City agrees to appoint a designated representative to coordinate with VDOT related to the requirements to acquire such permits and authorizations.

8.5. Operation and Maintenance. The City shall continue to maintain control of its traffic operations and traffic signals in the City, including those related to the Broad Street BRT.

8.6. The City shall notify VDOT, at least 10 days in advance, of any events of any kind, of which the City has knowledge, within the portion of the Project area under City's jurisdiction, which may require temporary suspension of Construction activities. In such cases where the City does not have knowledge 10 days in advance including, but not limited to, situations in which the City must temporarily suspend Construction activities to protect health, safety, and welfare, the City will notify VDOT as soon as reasonable in such circumstance.

9. COUNTY

9.1. Contribution of Funds. Subject to appropriation of the Board of Supervisors for Henrico County ("County Board"), the County shall make available to Sponsor the County's portion of the Total Capital Funds as set forth in Section 5 of this Agreement.

9.2. Review. The County acknowledges that time is of the essence regarding this Project and, subject to all legal requirements, the County agrees to work in good faith to review applications for permits and any other necessary authorizations for use of County right-of-way or for any permits or approvals otherwise required for the completion of the Project. The County agrees to appoint a designated representative to coordinate with VDOT related to the requirements to acquire such permits and authorizations.

9.3. The County shall notify VDOT, at least 10 days in advance, of any events of any kind, of which the County has knowledge, within the portion of the Project area within the County's jurisdiction, which may require temporary suspension of Construction activities. In such cases where the County does not have knowledge 10 days in advance including, but not limited to, situations in which the County must temporarily suspend Construction activities to protect health, safety, and welfare, the County will notify the VDOT as soon as reasonable in such circumstance.

9.4. Operation and Maintenance. The County shall continue to maintain control of its traffic operation and traffic signals in the County, including those related to the Broad Street BRT.

10. DRPT

10.1. Funds. Subject to the terms of the DRPT Grant Agreement 50017-01, DRPT shall make available to GRTC DRPT's portion of the Total Capital Funds as set forth in Section 5 of this Agreement, to be provided to GRTC as set forth in Section 7.2 of this Agreement.

10.2. DRPT may consult with VDOT, and any applicable contractors under agreement with VDOT in relation to the Project, in implementing the Project consistent with any applicable federal grants, including the TIGER Grant.

10.3. DRPT shall make available for use by VDOT any on-call contracts DRPT may have for services that VDOT may desire for the implementation of the Project, as permitted under any applicable procurement laws or regulations. VDOT shall comply with the terms and obligations of such contracts when using the services of those vendors under such DRPT on-call contracts.

## 11. COORDINATION AND COOPERATION.

The Project Partners and VDOT recognize the need for cooperation to expedite the development of the Project. The Project Partners and VDOT agree to coordinate their participation in the Project through those designated representatives appointed by each Project Partner.

11.1. Designated Project Representatives. Within 10 days following the date of this Agreement, the Project Partners and VDOT shall each designate one representative ("Designated Project Representative"), who shall be authorized to:

11.1.1. Coordinate the use of the Project Partner and VDOT staff assigned to the Project, and the resources allocated to the Project.

11.1.2. Communicate on behalf of their respective organization with other Designated Project Representatives.

11.1.3. Serve as the central point of contact for their respective organization with regards to the Project.

11.1.4. Present any issues affecting timely progress of the Project to their respective organization with appropriate recommended courses of action to any issues as they arise.

11.2. Designated Project Representatives are not authorized to amend this Agreement and cannot bind their respective organization to terms not specifically agreed to by the Parties pursuant to this Agreement, or to make other agreements, as may be required by the Project.

11.3. Changes in Designated Project Representative. The Parties reserve the right to change their respective Designated Project Representatives, upon written notice to the other Project Partners and VDOT, at any time. GRTC shall maintain an up-to-date list of Designated Project Representatives.

11.4. Additional Agreements. The Project Partners and VDOT agree to work in good faith to enter into any additional agreements, as may be necessary, to effectuate the terms of this Agreement, and to ensure the effective operation and maintenance of the Broad Street BRT. Any additional agreements with terms that conflict with the language in this Agreement shall not override the intent herein.

## 12. PROJECT OVERSIGHT

12.1. The Project Partners shall be afforded an active oversight role for the Project. VDOT shall provide to the Project Partners, copies of, or access to, all major Project deliverables and Project management documents related to Design, engineering, procurement, Construction, budget, schedule, risk management and other project management documents, reports, and deliverables.

12.2. The Project Partners may initiate and conduct oversight reviews and activities which may approximate those typically conducted by the FTA under its PMOC program for major capital projects; and VDOT agrees to fully coordinate and participate with such oversight reviews and activities. The Project Partners agree to conduct such oversight reviews and activities in such a manner so as to limit any unnecessary interference with VDOT's ability to perform its duties under this Agreement.

12.3. An Executive Oversight Board for the Project shall be established consisting of representatives from the Project Partners. Unless otherwise specifically provided, the approval of any item or issue by the Executive Oversight Board requires approval of all members.

12.3.1. Members of the Executive Oversight Board shall include:

DRPT: Director, or his/her designee.

Chief Administrative Officer ("CAO") for the City of Richmond or such City employee designated by the CAO.

Henrico County: County Manager or his/her designee.

GRTC: Chief Executive Officer or his/her designee.

12.3.2. Principal Contingency Fund. The Executive Oversight Board shall control the Principal Contingency Fund in accordance with Section 5.2 of this Agreement. No funds shall be expended or released from the Principal Contingency Fund without approval of the Executive Oversight Board.

12.3.3. Any individual expenditure or change order whose value exceeds five percent of the Project contract value, excluding any incentives in the design-build contract, must be approved by the Executive Oversight Board. Additionally, when the aggregate value of all change orders exceeds ten percent of the Project contract value, excluding any incentives in the design-build contract, any subsequent change orders must be approved by the Executive Oversight Board.

12.3.4. Final Plan. Any proposed project final plan shall not be the Final Plan unless approved by the Executive Oversight Board. After a Final Plan is established, the Final Plan may be amended with the approval of the Executive Oversight Board and concurrence by VDOT.

12.3.5. Project Completion. VDOT shall provide notice of Project Completion to the Executive Oversight Board. The official date of Project

Completion shall be the date such completion is approved by the Executive Oversight Board.

12.3.6. Betterments. No Betterments shall become part of the Final Plan unless an amendment to the Final Plan to add the Betterment is approved by the Executive Oversight Board; provided, however, that the Executive Oversight Board shall approve the Betterment if the requesting Party provides the necessary additional funds for adding the Betterment to the Final Plan and the Betterment does not cause construction delays. The additional amount provided shall include sufficient funds to cover any costs to complete the Project which would not have been incurred but for the approval of the Betterment.

12.4. VDOT shall set up accounting methods that are reasonably acceptable to the Executive Oversight Board and which are in compliance with applicable state and federal laws to track all expenditures specific to the Project. VDOT will also provide for accounting of all funds received, expended and available throughout the life of the Federal Grant Agreements, as required by DRPT and the USDOT.

12.5. Until Project Completion, GRTC shall, in consultation with VDOT, prepare detailed monthly financial reports and submit such reports to the Project Partners within 30 days of the reporting period end date. These reports shall have an executive summary which shall clearly identify any changes to the Project budget realized during the reporting period.

13. PERMIT AND ENFORCEMENT AUTHORITY.

Each Project Partner shall, to the extent legally permitted, use commercially reasonable efforts, acting in good faith, to expedite any and all permit reviews for the Project.

14. EQUIPMENT AND INFRASTRUCTURE.

Upon installation and acceptance, all Broad Street BRT equipment, appurtenances, and infrastructure shall be the property of the jurisdiction (i.e., the City or the County) in which they are located except as otherwise specifically provided herein or as may be otherwise specifically provided in any subsequent agreement between the applicable parties. All vehicles, ticket vending machines and station communication equipment associated with the Project shall be the property of GRTC.

14.1. If for any reason after the commencement of Construction (including after the commencement of revenue service of the Broad Street BRT, but prior to Project Completion) the Project or the operation of the Broad Street BRT is terminated (or any individual piece of equipment, appurtenance, or infrastructure component becomes obsolete or unnecessary for operation of the Broad Street BRT for reasons other than negligent Design, Construction, or installation), the owner of the particular piece of equipment, appurtenance, or infrastructure component, shall be responsible for the timely removal of such item in accordance with applicable laws. Subject to and unless otherwise specified by the terms of any subsequent operations and maintenance agreement between the relevant Parties, the owner of the particular piece of equipment, appurtenance, or

infrastructure component, shall be responsible for the timely removal of such item provided that funds are available to such Party for such removal or replacement.

14.2. The City and GRTC agree to share use of fiber communication facilities and resources installed as part of the Project in accordance with the terms of an anticipated subsequent and separate agreement between the City and GRTC.

## 15. INDEMNIFICATION BY THIRD PARTIES.

VDOT shall require all private third party vendors providing any goods or services related to the Project to defend, indemnify, and hold harmless the Project Partners, and each of their respective officers, directors, agents, and employees, whether elected, appointed, or otherwise (collectively referred to as the "Indemnitees" and individually as the "Indemnitee") from and against any and all liabilities, losses, damages, costs, expenses, claims, obligations, penalties, and causes of action (including without limitation, reasonable fees and expenses for attorneys, paralegals, expert witnesses, and other consultants, at their respective prevailing market rates for such services) (collectively, "Damages") whether based upon negligence, strict liability, absolute liability, product liability, misrepresentation, contract, implied or express warranty, or any other principle or theory of law or equity, that are imposed upon, incurred by, or asserted against an Indemnitee or the Indemnitees or which an Indemnitee or the Indemnitees may suffer or be required to pay and which arise out of or relate in any manner from the respective third party's performance of any work (or failure to perform any obligation or duty associated with such work) associated with the Project, and which is caused in whole or in part by the respective third party, or any of its agents, employees, officers, directors, contractors, subcontractors, affiliates, or anyone directly or indirectly employed by any of them, or anyone for whose acts or omissions any of them may be liable. Nothing contained in this section shall constitute or be construed to mean or result in any indemnification of any matter by any Project Partner to any other party. Nothing in this Agreement shall inure to the benefit of any third party for the purpose of allowing a claim otherwise barred by sovereign immunity or other operation of law, nor shall any portion of this Agreement be construed as a waiver of sovereign immunity or a waiver of the right to assert a defense of sovereign immunity by any of the Parties.

## 16. THIRD PARTY INSURANCE.

VDOT shall require all private third party vendors providing any goods or services related in any way to the Project and in any way related to the Broad Street BRT to provide and maintain insurance in accordance with the insurance coverage policies of GRTC or applicable state or federal laws for such third party goods and services providers. The respective policy or policies must name each of the Parties as an additional insured. Nothing contained herein shall require any Project Partner or VDOT to itself obtain any insurance. Nothing in this Agreement, including the requirement to list the Parties as "additional insureds" on any insurance policy shall constitute a waiver by the City, the County, or the Commonwealth of its grants and privileges under the principles of sovereign immunity, including the limitations of liability contained therein. GRTC shall provide evidence of insurance required by this Section to any Project Partner upon its request, which shall not be more frequently than twice per year.

17. RESOLUTION OF DISPUTES.

It is the desire and intent of the Parties to avoid, if possible, the expense and delay inherent in litigation. Therefore, the Parties agree that whenever any of the Parties cannot resolve an issue amongst another Party or other Parties, including negotiations amongst the designated project representatives or through the Executive Oversight Board, the affected Parties will engage in the alternative dispute resolution process described below prior to resorting to litigation.

17.1. Any Party may give another Party written notice of any dispute not resolved in the normal course of business, with copies to the other non-disputing Parties ("Notice"). Within 10 business days after delivery of the Notice, the receiving Party shall submit to the disputing Party a written response with copies to the other Party ("Response"). The Notice and Response shall each include: (1) a statement of the position of the Party delivering the Notice or the Response, as the case may be, and a summary of arguments supporting the Party's position; and (2) the name and title of the person who will represent that Party in the negotiation to resolve the dispute and of any other person who will accompany the representative.

17.2. In the event there is a dispute, within 10 business days after delivery of the Response, the representatives of the Parties shall meet at a mutually acceptable time and place, and thereafter as often as they reasonably deem necessary, to attempt to resolve the dispute. All reasonable requests for information made by one Party to the other will be honored. In an effort to facilitate the negotiation process, such representatives may agree to have an unrelated third Party moderate and facilitate the negotiations. If a Party intends to be accompanied at a dispute resolution meeting by an attorney, the other Party shall be given at least three business days' notice of such intention. Attorneys will follow the Virginia State Bar's Rules of Professional Conduct regarding attendance at meetings.

17.3. If the dispute has not been resolved within 30 calendar days after delivery of the Notice, or if the parties fail to meet within 20 calendar days, any of the Parties directly involved in the dispute may give written notice to the other Parties declaring the dispute resolution process terminated.

17.4. The Parties regard the obligations to notify other Parties of a dispute and to negotiate such dispute pursuant to this Section as an essential provision of this Agreement and one that is legally binding on each of them. In case of a violation of such obligation by any Parties, the other Parties may bring an action to seek enforcement of such obligation to any court of law having jurisdiction. Each Party shall bear its own costs and expenses incurred in connection with any negotiations and dispute resolution and litigation arising out of this Agreement.

17.5. Upon failure to resolve any dispute in accordance with this Section, the Parties may engage in mediation, or any other dispute resolution process at their discretion, or pursue other legal remedies.

18. TERM.

18.1. Effective Date. This Agreement shall be effective when executed by all Parties.

18.2. Expiration; Termination. This Agreement shall immediately terminate and be of no further effect upon the Parties, other than obligations which expressly survive the term hereof, upon the soonest to occur of the following (as applicable, the "Termination Date"):

18.2.1. Upon Project Completion, provided that the applicable Parties have executed and delivered a valid and effective agreement concerning the operations and maintenance of the Project.

18.2.2. Upon notice from GRTC to the parties hereto following termination by USDOT of the TIGER Grant Agreement pursuant to Section 5 thereof.

18.2.3. Upon 12 months following the Grant Termination Date, as such term is defined in the TIGER Grant Agreement.

19. MISCELLANEOUS.

19.1. Modification. This Agreement may only be amended or modified prior to the Termination Date by written agreement executed and delivered by each of the parties hereto.

19.2. Effective Date. This Agreement shall be effective when executed by all Parties.

19.3. Construction of this Agreement. This Agreement is intended by the Parties to be construed as whole and indivisible and its meaning is to be ascertained from the entire instrument. In the event any provision of this Agreement is capable of more than one reasonable interpretation, one which render the provision invalid and one that would render the provision valid, the provision shall be interpreted so as to render it valid. All parts of the Agreement are to be given effect with equal dignity, including but not limited to the recitals at the beginning of this Agreement, and all such parts, including the recitals, are to be given full force and effect in construing this Agreement. No provision of any recital shall be construed as being controlled by or having less force than any other part of this Agreement because the provision is set forth in a recital.

19.4. Captions, Headings, and Table of Contents. The captions, headings, and the table of contents of this Agreement are for convenience of reference only and in no way define, limit, or otherwise describe the scope or intent of this Agreement nor shall in any way affect this Agreement or the interpretation or construction thereof.

19.5. Governing Law. This agreement shall be construed under the laws of the Commonwealth of Virginia.

19.6. Assignment. No Party may assign this Agreement, or any portion thereof, without the prior, written consent of each of the Parties.

19.7. Third Parties. There shall be no third party beneficiaries with respect to this Agreement, and no right, nor any cause of action, shall accrue to or for the benefit of any third party.

19.8. Compliance. Except as explicitly provided for herein, any provision that permits or requires a Party to take action shall be deemed to permit or require, as the case may be, the Party to cause the action to be taken.

19.9. Further Assurances. The Parties shall cooperate and work together in good faith to the extent reasonably necessary to accomplish the mutual intent of the Parties as expressed and anticipated herein.

19.10. No Joint Venture or Agency. Nothing contained in this Agreement or any other document executed in connection herewith is intended or shall be construed to establish any of the Parties as a joint venturer or partner, team member, contractor, agent or assign of the other Parties. Each Party represents and warrants that it cannot create any obligation or responsibility on behalf of any other Party, nor bind them in any manner. Each Party is acting on its own behalf, and have made its own independent decision to enter into this Agreement, and have likewise determined that the same is appropriate, proper, and in its own self-interest based upon its own judgment and the advice from such advisers as it may deem necessary and proper. Additionally, the Parties, along with their respective agents, contractors, and subcontractors, shall perform all activities that are required and anticipated by this Agreement as separate and independent entities and not as agents of the other Party hereto.

19.11. Authority to Execute and Comply. The Parties each represent and warrant that their respective signatories hereunder have been duly and lawfully authorized by the appropriate body or official(s) to execute this Agreement. Additionally, the Parties each represent and warrant that they have respectively complied with all applicable requirements and preconditions of law necessary to enter into and be bound by this Agreement, and that they have full power and authority to comply with the terms and provisions of this Agreement.

19.12. Except as specifically otherwise set forth in this Agreement, the Chief Administrative Officer for the City of Richmond or the designee thereof may provide any authorization, approvals, and notices contemplated herein on behalf of the City.

19.13. All payments and other performance by the City under this Agreement are subject to appropriations by the City Council; consequently, this Agreement shall bind the City only the extent the City Council appropriates sufficient funds for the City to perform hereunder.

19.14. All payments and other performance by the County under this Agreement are subject to appropriations by the County Board of Supervisors; consequently, this Agreement shall bind the County only the extent the County Board of Supervisors appropriates sufficient funds for the County to perform hereunder.

19.15. All payments and other performance by DRPT or VDOT under this Agreement are subject to appropriations by the General Assembly and approval of allocations by the Commonwealth Transportation Board; consequently, this Agreement shall bind DRPT or VDOT only the extent the General Assembly appropriates and the Commonwealth Transportation Board allocates sufficient funds for DRPT or VDOT to perform hereunder.

19.16. Binding Nature of this Agreement. This Agreement shall be binding upon and shall inure only to the benefit of the Parties hereto.

19.17. Computation of Time. In computing any period of time prescribed or allowed under this Agreement, the day of the act, event, or default from which the designated period of time begins to run shall not be included. The last day of the period so computed shall be included unless it is a Saturday, Sunday, or legal holiday, in which case the period shall run until the end of the next day which is neither a Saturday, Sunday, or legal holiday. When the period of time prescribed or allowed is less than seven days, intermediate Saturdays, Sundays, and legal holidays shall be excluded in the computation.

19.18. Counterparts; Copies. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same agreement. True and accurate photocopies, facsimiles, or other mechanical reproductions shall have the same force and effect as the validly executed original, and, in lieu of the validly executed original, any party hereto may use such reproduction of this Agreement in any action or proceeding brought to enforce or interpret any of the provisions contained herein.

[SIGNATURE PAGES FOLLOW]

**IN WITNESS WHEREOF**, the undersigned Parties have duly and lawfully approved this Agreement and have authorized its execution and delivery by their respective authorized agents, who have set their hands and had their seals affixed below, all as of the date first written hereinabove.

**GRTC:**

**GREATER RICHMOND TRANSIT CO.,**
a Virginia corporation

DATE: _____

By: _____(SEAL)
Name: _____
Title: _____

**VDOT:**

**VIRGINIA DEPARTMENT OF TRANSPORTATION,** an agency of the Commonwealth of Virginia

DATE: _____

By: _____(SEAL)
Name: _____
Title: _____

**DRPT:**

**THE DEPARTMENT OF RAIL AND PUBLIC TRANSPORTATION,** an agency of the Commonwealth of Virginia

DATE: _____

By: _____(SEAL)
Name: _____
Title: _____

[*Counterpart to Broad Street Bus Rapid Transit Project Development Agreement*]

**CITY:**

**THE CITY OF RICHMOND, VIRGINIA,**
a municipal corporation of the Commonwealth of Virginia

DATE: _____

By: _____(SEAL)
Name: _____
Title: _____

APPROVED AS TO FORM:

_____
City Attorney

**COUNTY:**

**HENRICO COUNTY, VIRGINIA,**
a municipal subdivision of the Commonwealth of Virginia

DATE: _____

By: _____(SEAL)
Name: _____
Title: _____

APPROVED AS TO FORM:

_____
County Attorney

[***Counterpart to Broad Street Bus Rapid Transit Project Development Agreement***]

# EXHIBIT A

**The Broad Street BRT plan approved by the Planning Commission for the City of Richmond on November 16, 2015**

Attached hereto

# Application for URBAN DESIGN COMMITTEE Review

Department of Planning and Development Review
Planning & Preservation Division
900 E. Broad Street, Room 510
Richmond, Virginia 23219
(804) 646-6335
http://www.richmondgov.com/CommitteeUrbanDesign

## Application Type

- ☐ Addition/Alteration to Existing Structure
- ☑ New Construction
- ☐ Streetscape
- ☐ Site Amenity
- ☐ Encroachment
- ☐ Master Plan
- ☐ Sign
- ☐ Other

## Review Type

- ☐ Conceptual
- ☑ Final

Project Name: GRTC Bus Rapid Transit (BRT) Project

Project Address: Broad Street (Staples Mill Rd to 14th St.) and East Main Street (14th Street to Rockett's Landing)

Brief Project Description (this is not a replacement for the required detailed narrative): The Bus Rapid Transit project sponsored by the Greater Richmond Transit Company (GRTC) is to be located primarily in the City of Richmond with a guideway of dedicated median bus lanes and curb lanes extending 7.6 miles from Willow Lawn in the west to Rockett's Landing in the east. A total of 14 station will be constructed along the guideway - 13 in the city.

## Applicant Information

(on all applications other than encroachments, a City agency representative must be the applicant)

Name: Douglas C. Dunlap Email: Douglas.Dunlap@richmondgov.com

City Agency: Economic and Community Development Phone: 804.646.5663

Address: City Hall, 800 East Broad Street, Richmond VA

Main Contact (if different from Applicant): Sid Pawar

Company: VDOT Richmond District Phone: 804.524.6095

Email: sid.pawar@vdot.virginia.gov

## Submittal Deadlines

All applications and support materials must be filed no later than 21 days prior to the scheduled meeting of the Urban Design Committee (UDC). Please see the schedule on page 3 as actual deadlines are adjusted due to City holidays. **Late or incomplete submissions will be deferred to the next meeting.**

## Filing

Applications can be mailed or delivered to the attention of "Urban Design Committee" at the address listed at the top of this page. **It is important that the applicant discuss the proposal with appropriate City agencies, Zoning Administration staff, and area civic associations and residents prior to filing the application with the UDC.**

## UDC Background

The UDC is a ten member committee created by City Council in 1968 whose purpose is to advise the City Planning Commission on the design of projects on City property or right-of-way. The UDC provides advice of an aesthetic nature in connection with the performance of the duties of the Commission under Sections 17.05, 17.06 and 17.07 of the City Charter. The UDC also advises the Department of Public Works in regards to private encroachments in the public right-of-way.

Kimley»Horn

URBAN DESIGN COMMITTEE and PLANNING COMMISSION REVIEW
GRTC Bus Rapid Transit (BRT) Project Cover Letter

City of Richmond
Urban Design Committee
c/o Ms. Andrea Almond, PLA, ASLA
900 East Broad Street
Room 510
Richmond, VA 23219

## 1) Current Status

The GRTC BRT conceptual design was completed in May 2015. The project subsequently received conditional approval from Urban Design Committee (UDC) and Planning Commission (PC) in August and September, respectively. Since then, the project team has been responding to UDC and PC comments and making necessary revisions to the conceptual plans and associated technical documents.

Recently, the project's funding partners decided that the project would be delivered via a Design-Build method as opposed to a traditional Design-Bid-Build method. The key difference in this delivery method is that in a Design-Build project delivery method the contractor and the designer will be working concurrently as one team to deliver the GRTC BRT project in a shorter timeframe. Design-Build can be more cost effective as the contractor has opportunities for innovation in both design and construction and construction can begin while design process is still being developed potentially reducing the overall project duration.

VDOT will be managing the delivery of the Design-Build project on behalf of GRTC, the City of Richmond, and Henrico County. VDOT has a proven track record of successfully implementing Design-Build projects on-time and within budget.

## 2) Design-Build Project Schedule

The Design-Build schedule for the GRTC BRT project is as follows:

- Statement of Qualifications Submission Date 11/4/2015
- Notification of Shortlist 11/18/2015
- Anticipated Request for Proposal (RFP) Release Date 11/24/2015
- Anticipated Award Date 03/16/2016
- Final Project Completion 08/16/2017

## 3) Urban Design Committee and Planning Commission Comments and Approval

All UDC and PC comments are being addressed through definitive responses to each comment. The GRTC BRT Project team has addressed each comment and requests that the UDC and PC provide clear final design requirements, if any, that VDOT can convey to the Design-Build team.

The UDC/PC requirements will be included in the RFP so that the Design-Build contractor has the necessary information to construct the BRT project in accordance with any final requirements. The Design-Build team plans to update the project stakeholders throughout the delivery of the project. This will ensure that the most efficient and cost effective design that meets the specifications of the BRT project is delivered to the public. In the event that any major changes are made to the station architecture and

urban design components of the project, the Design-Build team will be required to submit a final plan for UDC/PC approval. If there are no significant changes to the station and urban design plans, project construction will commence with the approved UDC/PC approval conditions

The project team is requesting that the UDC and PC provide final approval with any amendments to the approval conditions so that a clear and detailed scope of work can be presented to the potential Design-Build teams. Revising the plans to implement the agreed upon changes will come through the efforts of the Design-Build team in implementing the agreed upon scope of work.

| Item | UDC/PC Comment | Stakeholder Response |
|---|---|---|
| 1 | That the BRT planning team investigates utilizing a median-running operation from N. Foushee Street to N. 9th Street and what potential impacts not doing so would have on plans for a future light-rail system, fully recognizing the need for two general purpose lanes and the addition of left turn lanes and local transit stops as needed. | A technical memorandum addressing this comment has been prepared and will be submitted to UDC/PC. Median running operation is not recommended on this section of Broad Street due to the following main issues: (1) There is insufficient right-of-way to accommodate the median running guideway on this section of the corridor and allow for local bus service to operate on a curb lane (2) There are a significant number of transfers that take place on this section of Broad Street, which would require having local running buses on the curb (3) There are street light poles that are not feasible to relocate away from the median in this section of Broad Street due to conflict with the General Assembly building basement (4) The project budget did not include the cost of a median running guideway or stations along this section of Broad Street. It is estimated to be an increase of $1.8M that would need to be funded completely by the City of Richmond (5) Operating BRT in the curb running lane will not preclude a light rail system from being constructed in the median of Broad Street at a future time. |
| 2 | That the BRT planning team investigates utilizing Governor Street as opposed to N. 14th Street to make the connection to E. Main Street. | A letter from the Department of General Services, the Virginia State Police, and the Division of Capitol Police addressing this comment will be submitted to UDC/PC. These departments do not support the use of Governor Street for BRT service. |
| 3 | That the BRT planning team continues to study opportunities to provide additional left turn movements from Broad Street, particularly at N. Boulevard and N. Lombardy Street, fully recognizing the impact to parking totals and the important role that parking provides as a buffer for pedestrians from moving travel lanes. | A technical memorandum addressing this comment has been prepared and will be submitted to UDC/PC. Of the left turns requested, project stakeholders have agreed to provide only the westbound left turn at Boulevard. Conceptual plans will be updated and submitted to UDC/PC. |

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| Item | UDC/PC Comment | Stakeholder Response |
|---|---|---|
| 4 | That the final plans include details for each station showing the dimensions, materials and finishes of all structural components and amenities. | A technical memorandum and renderings addressing this comment has been prepared and will be submitted to UDC/PC. Design-build bridging documents and technical requirements will be prepared to stipulate station dimensions, materials, and finishes. |
| 5 | That the final plans show the location of each station and the businesses/buildings adjacent to them to determine the impact of the station on the adjacent private properties. | A technical memorandum addressing this comment has been prepared and will be submitted to UDC/PC. The memorandum documents the location of each station and the businesses/buildings adjacent to them. Conceptual plans have been completed and are attached to the technical memo. |
| 6 | That the BRT planning team and applicable City agencies develop a plan to provide a buffer (planters/street trees/bike racks, etc.) in areas along the corridor where on-street parking will be removed in order to enhance the streetscape for pedestrians. | This will be accomplished via a separate Capital Improvement Project that will be developed by the City of Richmond. |
| 7 | That the City Department of Public Works coordinates with GRTC to examine areas where curb cuts could be closed or reduced in width to allow for additional on-street parking. | A technical memorandum addressing this comment has been prepared and will be submitted to UDC/PC. A parking mitigation plan will be prepared as part of the BRT Project to examine management of on-street parking and the potential closure of existing curb cuts. |
| 8 | That the final plans include a tree survey, showing the location, size and species of all trees that will be removed along the project corridor as a result of this project. | Design-build bridging documents and technical requirements will be prepared. The BRT planning team has coordinated with City Department of Urban Forestry as requested. |
| 9 | That the City Department of Public Works Urban Forestry Division coordinates with GRTC to provide deciduous, shade-producing street trees in areas adjacent to those where existing trees will be removed, of, if space if not available in the vicinity, in order areas along the BRT corridor. | Design-build bridging documents and technical requirements will be prepared. The BRT planning team has coordinated with City Department of Urban Forestry as requested, and a tree survey will be completed that shows the location, size, and special of all trees that will be removed along the project corridor as a result of this project. |
| 10 | That the final plans include a signage package, to include signs placed upon or adjacent to the roadway as well as station identifying signage. This package should include materials, finishes and dimensions of the signs. | Design-build bridging documents and technical requirements will be prepared. Wayfinding guidance will be added. The design-build firm will be required to provide submittals including materials, finishes and dimensions of the signs. |

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| Item | Comment Text | Stakeholder Action Items |
|---|---|---|
| 11 | That the final plans include a lighting plan for the stations, to include make, model and finish of any light fixture; light source and light color temperature. LED lights with a color temperature of 3000k are recommended. The lighting plan should also include a representative photometric diagram for at least one of the stations. | A representative photometric diagram will be prepared and submitted to UDC/PC for a typical station. No ornamental light replacements will be needed per the City of Richmond Department of Public Utilities. Design-build bridging documents and technical requirements will be prepared to specify these lighting requirements. |
| 12 | That the BRT planning team provide a plan showing how the existing bus stops along the BRT route will be impacted and how they connect into the BRT stations. | The City of Richmond and GRTC will conduct a Comprehensive Operations Analysis (COA) that will evaluate the entire GRTC system. The COA will provide system-wide recommendations that will more fully address the questions and concerns regarding local route connectivity to the BRT system. |
| 13 | That the plant palette is adjusted to include more drought tolerant and native species. | Design-build bridging documents and technical requirements will be prepared. The BRT planning team has coordinated with City Department of Urban Forestry as requested to identify an acceptable plant palette. |
| 14 | That the BRT planning team considers an alternate design for the walk-through stations that would provide better pedestrian flow. | A technical memorandum addressing this comment has been prepared and will be submitted to UDC/PC. The design team considered alternate station configurations and has identified an alternative that provides better pedestrian flow. |
| 15 | That the BRT planning team ensure that the totem design does not block views. | A technical memorandum addressing this comment has been prepared and will be submitted to UDC/PC. The design team has documented how visual obstruction by the totem will be minimal. |
| 16 | That the BRT planning team considers more options to uplight the BRT stations. | The design team has worked out details for how to provide uplight to the ceiling of the stations. Design-build bridging documents and technical requirements will be prepared to stipulate these lighting designs. |
| 17 | That the BRT planning team seeks to reduce the mass of the station roof form, particularly for the three downtown curb-running locations. | A technical memorandum and renderings addressing this comment has been prepared and will be submitted to UDC/PC. The design team has refined the station design to reduce the overall thickness of the roof by 4". Design-build bridging documents and technical requirements will be prepared to stipulate station roof mass. |
| 18 | That the BRT planning team considers providing higher capacity bike racks at stations. | A technical memorandum and renderings addressing this comment has been prepared and will be submitted to UDC/PC. The design team will ensure that the design-build technical requirements call for bike racks that are of a design approved by the City. |

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| Item | Comment Text | Stakeholder Action Items |
|---|---|---|
| 19 | That the BRT planning team and the City considers locating bike share stations near the BRT stations. | The design team will include instructions in the technical requirements for the design-builder of the BRT project that coordination on bike share locations with the City shall continue. |
| 20 | That the BRT planning team investigate providing better connectivity and service to communities in the east end. | The City of Richmond and GRTC will conduct a Comprehensive Operations Analysis (COA) that will evaluate the entire GRTC system. The COA will provide system-wide recommendations that will more fully address the questions and concerns regarding local route connectivity to the BRT system. |
| 21 | That a 10' vehicular lane width is maintained except for bus lanes. | A technical memorandum addressing this comment has been prepared and will be submitted to UDC/PC. A 10-foot vehicular lane width will be maintained along the GRTC BRT project corridor with the exception of travel lanes that will carry local buses or BRT buses. |
| 22 | That the BRT planning team investigate using adaptive technology for left turn movements. | The design team has investigated the use of adaptive technology for left turn movements and documented findings in a technical memorandum to be submitted to UDC/PC. |
| 23 | That a review at the 60% design stage include connectivity to the neighborhoods, access to the Scott's Addition particularly at Summit Avenue, and the median running design of the system | A technical memorandum addressing this comment has been prepared and will be submitted to UDC/PC. An eastbound left-turn lane is not recommended at Summit Avenue due to the location of the adjacent BRT station. Conceptual plans will be updated and submitted to UDC/PC. |

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October 15, 2015

**To: Urban Design Committee, City of Richmond**

RE: ***Median-Running BRT from Foushee Street to 9th Street***

**UDC/PC Comment 1:** That the BRT planning team investigates utilizing a median-running operation from N. Foushee Street to N. 9th Street and what potential impacts not doing so would have on plans for a future light-rail system, fully recognizing the need for two general purpose lanes and the addition of left turn lanes and local transit stops as needed.

**Applicant Response:** Utilizing a median-running operation from N. Foushee Street to N. 9th Street through Downtown would have negative impacts on the Broad Street corridor and is not recommended for the following reasons:

- Operating a BRT in the curb running lane will not preclude a light rail system from being constructed in the median of Broad Street at a future time.
- The project budget did not include the cost of a median running guideway or stations along this section of Broad Street. It is estimated to be an additional cost of $1.8 million in City funds.
- There are a significant amount of transfers that take place on this section of Broad Street. It is essential that transfers between the BRT and local bus be safe and efficient, which is best done curbside rather that from the median.
- Left turns as allowed in the downtown section of Broad Street today would be limited to accommodate median-running BRT.
- There is insufficient right-of-way to accommodate the median running guideway and allow for local bus service to operate on a curb lane.

## SUPPORTING DOCUMENTATION

### Potential for Future Light-Rail

The configuration of Broad Street for median-running BRT would require modifications to the existing median from Foushee Street to 9th Street. The raised and landscaped median would be narrowed to provide 11 foot wide dedicated BRT lanes. A future light-rail transit (LRT) system operating in the median would require extensive modifications beyond those required for BRT operations. Full reconstruction of the center of Broad Street would be necessary to lay tracks and proper foundations for heavier transit vehicles (BRT vehicles weigh approximately 20 tons loaded while LRT vehicles weight approximately 50 tons loaded). The width of dedicated guideway required for light-rail is greater than that of BRT to account for larger vehicles, overhead catenary system support poles for power, and desired separation from vehicular traffic for safety. Any improvements constructed for median-running BRT would not meet the needs for a future light-rail system without major reconstruction.

## Increased Cost of Construction

The construction of median-running BRT lanes from Foushee Street to 9th Street would cost approximately $1.8 Million more than the current proposed concept for mixed flow and curb running operations within the same segment. The additional four blocks of construction from Foushee Street to 4th Street is not currently in the project budget, as the current plan proposes no roadway modifications for this stretch where the BRT will operate in mixed flow conditions.

Median-running BRT requires stations be located in the center of Broad Street. The current proposed 9th Street stations would require the westbound station be located in the block between 8th Street and 9th Street and the eastbound station be located in the block between 9th Street and 10th Street. Therefore continuing median-running BRT to 9th Street would actually require dedicated lanes through 10th Street.

Median-running from 4th Street to 10th Street would require greater and more costly median modifications than curb-running operations. The current curb-running concept is able to preserve much of the existing median from 4th Street to 8th Street, whereas median-running would require additional paving and construction of new concrete curb, median, and landscaping in these blocks. Median-running BRT would also require the reconstruction of several traffic signal poles and mast arm sign poles that are currently located in the median; these poles are proposed to remain with curb-running operations. Relocated signal poles would need to be placed on the curb where existing utilities, underground electric power vaults, and basements of adjacent buildings, including the General Assembly Building on the southeast corner of Broad Street and 9th Street, could all be impacted at the project's expense.

**Table 1: Summary of approximate cost impacts**

| BRT Component | Additional Cost for Median-Running* |
|---|---|
| Roadway (median, guideway, landscaping, etc.) | $1,050,000 |
| Stations | $200,000 |
| Utilities (relocations and upgrades) | $150,000 |
| Signals and Systems | $400,000 |
| **TOTAL** | **$1,800,000** |

*Applies to downtown Broad Street corridor from Foushee Street to 11th Street only

## Transfers to Local Routes

Downtown Richmond has the highest concentration of GRTC's transfers between local bus routes. Consequently the area will serve a high volume of transfers between local bus routes and the BRT system. Figure 1 shows a map of the five routes with the most transfers to GRTC's Route 6, which most closely resembles the proposed BRT route. Each of these routes has between 135 and 235 transfers per day to Route 6, all within the Foushee Street to 14th Street Downtown corridor.

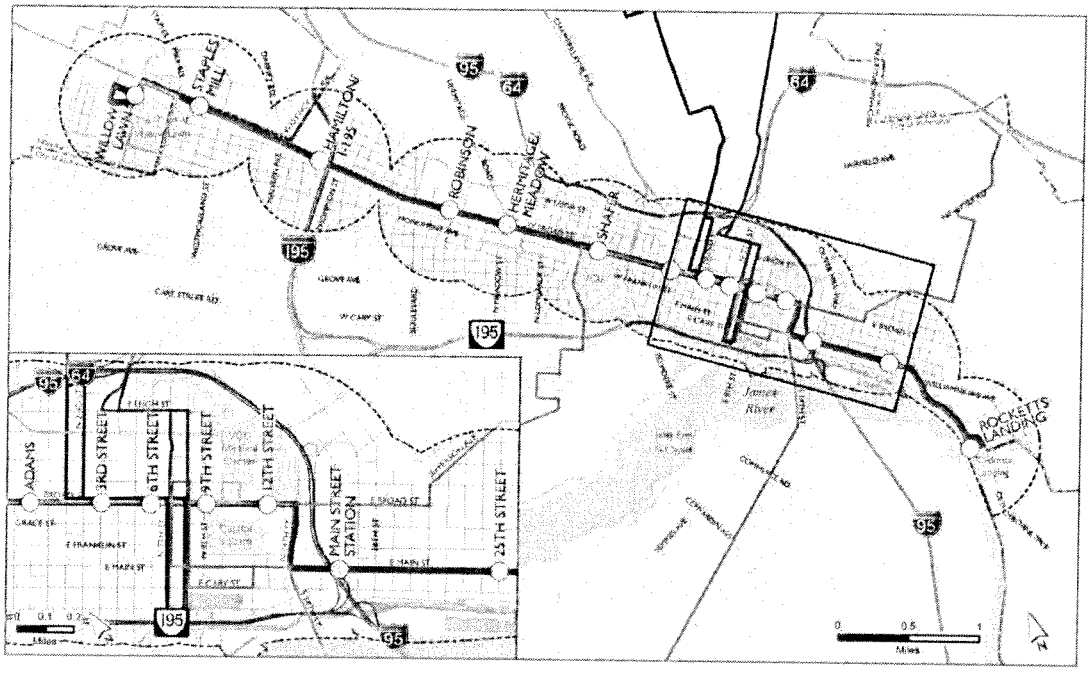


**Figure 1: Local routes with most transfers to proposed BRT**

A separate GRTC BRT Technical Services study is currently underway to examine how to best accommodate connections between local routes and the BRT. Preliminary findings of this study prepared by Nelson/Nygaard proposed consolidating several local stops currently spread across a few blocks into one stop located adjacent to the BRT station to facilitate transfers. This is referred to as a consolidated stop.

If the BRT stations are located on the curb as currently proposed, passengers will be able to make a safer connection to local routes via the sidewalk. Passengers may have to cross a minor north-south street at some locations to make these transfers. However, if the BRT stations are located in the median for median-running BRT, passengers will have to cross Broad Street to access curbside local route stops whether they are consolidated or not. While these passengers will be utilizing crosswalks on Broad Street, exposing a larger volume of transferring passengers to Broad Street vehicular traffic is less safe than connections that don't require a major street crossing. Creating higher pedestrian crossings of Broad Street also will impact traffic operations as turning vehicles are delayed by pedestrians in crosswalks. This safety issue is less of a concern in the median-running section of

BRT from Thompson Street to Foushee Street due to the much lower volume of expected transfers to local routes.

### Left Turn Access

As demonstrated in the current concept, providing left-turn access in a median-running segment of BRT requires dedicated turn lanes. The following typical sections demonstrate how a BRT station and a left turn lane cannot be accommodated at the same location without roadway widening. Broad Street is approximately 82' from curb to curb and any widening to either side would be very costly due to the high concentration of public and private utilities and drainage structures within 3 feet of the curb. Figure 2 shows what a typical section of Broad Street at a BRT station would be for the 5th Street or 9th Street stations. Figure 3 shows what a typical section of Broad Street would be at a dedicated left turn lane. Lane widths shown in each section reflect the minimums agreed upon by project partners after extensive consideration, conversation, and review.

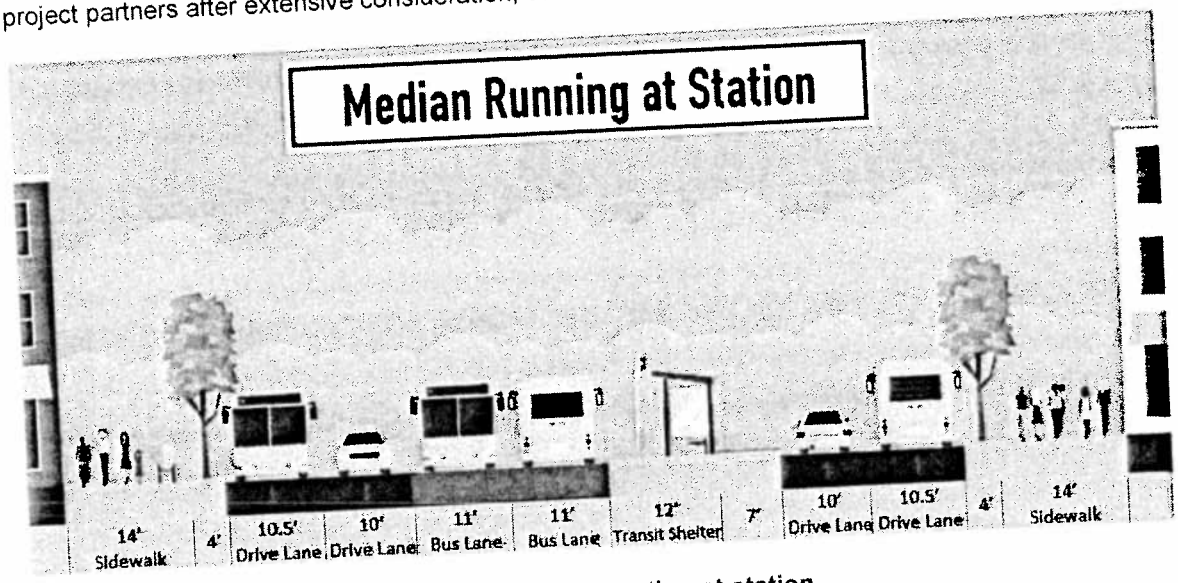


**Figure 2: Typical section at station**

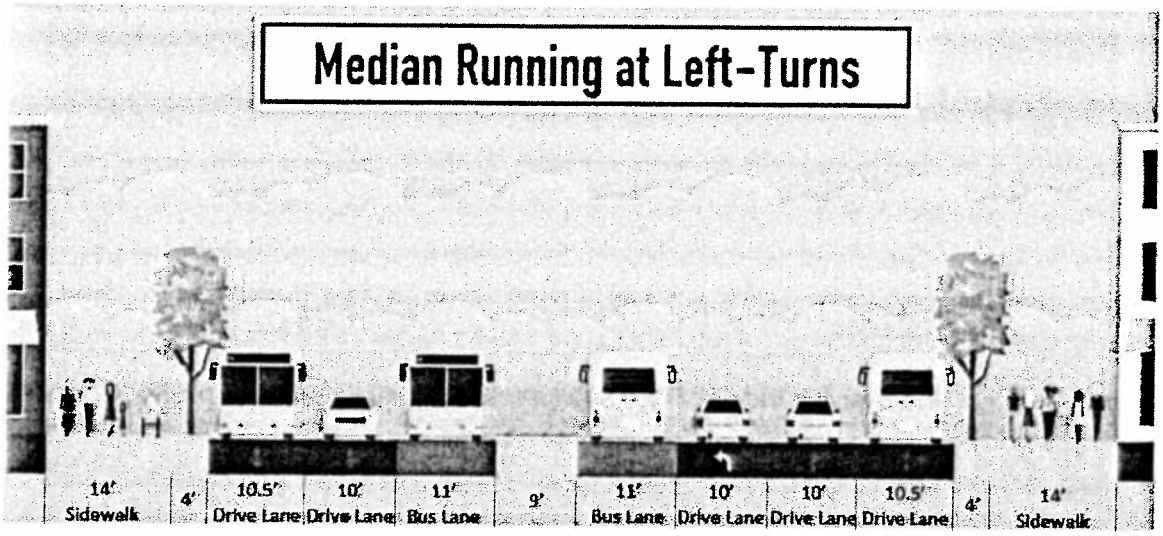


**Figure 3: Typical section at left-turn lane**

In Figure 2 at the BRT station, there is only 7' in the median unallocated to lanes or stations, narrower than the 10' required for a turn lane. In Figure 3 there is only 9' in the median unallocated to lanes, narrower than the 12' required for a station. Therefore left turns cannot be accommodated in the blocks where stations are located.

Left turn movements adjacent to a median-running transit lane, BRT in this case, must be protected left-turns (when the signal shows only a green arrow, yellow arrow, or red arrow) from dedicated left-turn lanes. Allowing permitted-protected left turns (when the signal shows a green ball and the driver decides if a left turn is safe in front of oncoming traffic) is not advisable and creates a safety issue when a left-turning vehicle must look behind them to see if a BRT bus is coming. Figure 4 shows an example of protected left turn lanes adjacent to dedicated median-running BRT lanes.

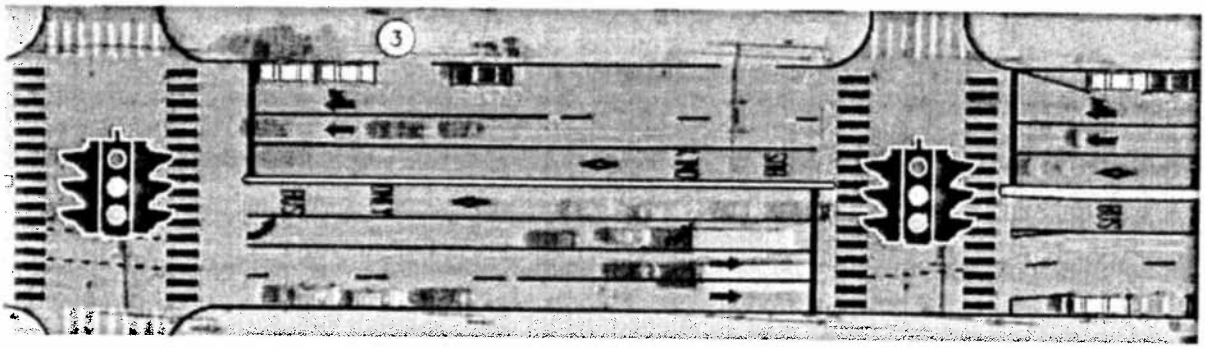

**Figure 4: Example of dedicated left turn lane adjacent to median-running BRT**

Table 2 details the existing left turns allowed from Broad Street today between Foushee Street and 10th Street and which turns could be accommodated with median-running BRT operations.

**Table 2: Summary of changes to left turn locations**

| Turn | Existing | Proposed Curb-Running | Proposed Median-Running |
|---|---|---|---|
| WB to Foushee Street | ● * | X | X |
| WB to 1st Street | ● | ● | ● |
| EB to 2nd Street | ● | ● | ● |
| EB to 3rd Street | ● | ● | X |
| WB to 3rd Street | X | X | ● |
| WB to 5th Street | ● | ● | X |
| EB to 6th Street | ● * | ● * | X |
| WB to 6th Street | ● * | ● * | ● |
| EB to 7th Street | ● * | ● * | ● |
| WB to 8th Street | ● | ● | X |
| EB to 9th Street | ● | ● | X |

Key: ● = Allowed, X = Prohibited, * = Time Restricted

The loss of left turn access at some locations due to BRT station locations could have critical impacts on traffic flow within Downtown. The westbound left-turn onto 8th Street is the first allowable left turn off of Broad Street for vehicles exiting from Interstate 95 and carries approximately 280 vehicles/hour in the peak hour. 8th Street is a four-lane, principal arterial providing a vital connection to the Manchester Bridge and Richmond's Southside. These vehicles would be forced to travel two more blocks and utilize 6th Street, a two-lane local street with far less capacity than 8th Street. The additional loss of the westbound left-turn at 5th Street (80 vehicles/hour in the peak hour) would push these left turning vehicles westward on Broad Street. To alleviate the additional left turn demand, a dedicated westbound left at 3rd Street could be added; however as many as 360 additional vehicles in the peak hour would be displaced to smaller streets between the loss of 8th Street and 5th Street left turn access.

Some lost left turns could be maintained by shifting the BRT stations to an adjacent block. However, moving stations would adversely affect left turns on the adjacent blocks and could place the stations at less desirable locations for transit service. For example the westbound left turn onto 8th Street could be maintained; however this would push the 9th Street BRT stations from the blocks between 8th Street and 10th Street to the blocks between 9th Street and 11th Street – very close to the proposed 12th Street BRT stations. This station shift would also prohibit the eastbound left turn onto 11th Street and shift the end of dedicated BRT lanes to 11th Street having additional cost implications.

## Local Buses in Shared Lanes

Curb-running BRT vehicles will share dedicated lanes with local bus routes, whereas median-running BRT vehicles would have a lane dedicated solely to BRT. While this is a potential improvement for BRT operations, it would require general traffic to share the outside travel lane with local buses. Figure 5 below shows what the typical section could look like when local buses are present. Today more than twenty GRTC local routes have at least one stop on Broad Street between Foushee Street and 12th Street. When local buses are making stops, general traffic in the outside travel lane must to wait behind the stopped bus or be forced into the one lane available for general traffic. Additionally, traffic analysis shows that peak hour vehicle queues are expected to extend beyond the dedicated lane and into general travel lane. Queue spillback into inside travel lanes coupled with local bus service running in the outside travel lanes would significantly reduce through capacity on Broad Street assuming a median-running BRT.


**Figure 5: Broad Street with both BRT buses and local buses**

## Median Landscaping

Landscaping in the existing median of Broad Street is aesthetically pleasing and serves as an enhancement to this place-making corridor. Continuing median-running BRT from Foushee Street to 10th Street would require greater reduction of the existing median than curb-running BRT. The current plan for curb-running BRT preserves all medians and landscaping from Foushee Street to 8th Street, with the exception of one block. Median-running BRT would reduce the width of the median due to the presence of a station or dedicated left turn lane, and thus eliminate more of the existing landscaping.

October 2, 2015

City of Richmond
Urban Design Committee
900 East Broad Street
Room 510
Richmond, VA 23219

**RE: Response to UDC/Planning Commission Comments from September 9, 2015 PC Meeting Minutes**

UDC/PC Comment #2: ***That the BRT planning team investigates utilizing Governor Street as opposed to N. 14th Street to make the connection to E. Main Street.***

Applicant Response: Governor Street currently is in active use as a state access-only road on which authorized state vehicles traverse for business purposes and which is utilized for permanent state parking. The proposal to utilize Governor Street for the BRT project was presented to the Virginia Department of General Services (DGS). DGS did not support this proposal for government security reasons. A letter explaining their concerns was sent to the UDC on September 8, 2015.

## SUPPORTING DOCUMENTATION

Letter from the Department of General Services.

# COMMONWEALTH of VIRGINIA

*Department of General Services*

Richard F. Stilwosld, P.E.
Director

Joseph F. Damico
Deputy Director

1100 Bank Street
Suite 420
Richmond, Virginia 23219
Voice (804) 786-3311
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September 8, 2015

City of Richmond
Planning & Development Review
Urban Design Committee, Chairman
900 E. Broad Street, Room 511
Richmond, VA 23219

Dear Sir or Madam:

Please accept this letter in response to the outcome of your meeting on August 20, 2015, recommending that the Greater Richmond Transit Company (GRTC) consider realignment of the Bus Rapid Transit (BRT) route from 14th Street to Governor Street.

As was submitted by GRTC for consideration at the August 20, 2015 meeting, their current plan uses 14th St. to turn south from Broad St. in order to connect with Main St. to continue to further stops south and east. A change from the current plan to instead use Governor St. for southward access is troublesome to the state.

First, the realignment of the BRT route to Governor Street would pose a security to sensitive state facilities.

Second, Governor St. is actively used as a state access-only road on which authorized state vehicles traverse for business purposes and utilize for permanent parking. The location of the BRT route along Governor St. would force the relocation of current parking in order to accommodate bus lanes due to the road's relative narrowness (as compared to 14th St.). These parking spots serve a critical function of providing close and secure parking access for some of the state's top officials and, as such, would result in a shortage of available parking to meet current state demand.

Please contact me with any questions.

Sincerely,

Marc S. Wiley
First Sgt. Marc S. Wiley
Virginia State Police

Col. Steven Pike
Div. of Capitol Police

Joseph F. Damico
DGS Deputy Director

Kimley»Horn

October 15, 2015

**To: Urban Design Committee, City of Richmond**

RE: ***Parking Related Comments for GRTC Bus Rapid Transit Project***

**UDC/PC Comment 3, 6, and 7:**

- That the BRT planning team continues to study opportunities to provide additional left turn movements from Broad Street, particularly at N. Boulevard and N. Lombardy Street, fully recognizing the impact to parking totals and the important role that parking provides as a buffer for pedestrians from moving travel lanes.
- That the City Department of Public Works coordinates with GRTC to examine areas where curb cuts could be closed or reduced in width to allow for additional on street parking.
- That the BRT planning team and applicable City agencies develop a plan to provide a buffer (planters/street trees/bike racks, etc.) in areas along the corridor where on-street parking will be removed in order to enhance the streetscape for pedestrians.

**Applicant Response:**

- The BRT planning team has accounted for parking impacts due to all of the proposed left-turn movements within the median running segment of the BRT corridor from Thompson Street to Foushee Street.
- The BRT planning team has reviewed existing curb cuts and has made recommendations within this memorandum for where closure or reduction of the curb cuts could be implemented by the City.
- The BRT planning team has documented, through attached figures, where additional buffers will be needed due to the proposed removal of on-street parking. The City of Richmond will address buffer areas via streetscape projects separate from the BRT Project.

## SUPPORTING DOCUMENTATION

### Background

The construction of the GRTC BRT Project and associated roadway geometric modifications will require alteration to the supply of on-street parking along some segments of the proposed BRT corridor within the Museum District/VCU, Downtown, and East End areas. Significant efforts have been made to minimize these impacts through a variety of strategies. The proposed parking impacts on Broad Street between Thompson Street and 14th Street have been presented to the public, the Urban Design Committee, the Planning Commission, and other project stakeholders. Three Public Meetings have been held since January 2015 and over 30 neighborhood / civic association meetings and presentations regarding the GRTC BRT Project have also been offered to the public. This memorandum provides an update on proposed parking impacts as of the July 2015 Parking Report and expands the focus area to include the entire BRT alignment.

## Parking Occupancy

Parking inventory and occupancy studies were completed in the fall of 2014 between Thompson Street and 14th Street along Broad Street and extending one block on each side street. Peak on-street parking utilization on Broad Street is summarized in **Table 1** – Summary of Peak On-Street Parking Utilization.

**TABLE 1 – SUMMARY OF PEAK ON-STREET PARKING UTILIZATION**

| Subarea | Maximum Utilization (%) | | | Maximum Existing Spaces Used |
|---|---|---|---|---|
| | Daytime | Nighttime | Weekend | |
| Thompson Street to Sheppard Street | 7% | 3% | 5% | 9 |
| Sheppard Street to Lombardy Street | 32% | 30% | 48% | 118 |
| Lombardy Street to Foushee Street | 71% | 67% | 89% | 218 |
| Foushee Street to 4th Street | 63% | 47% | 76% | 29 |
| 4th Street to 14th Street | 54% | 29% | 86% | 48 |
| Corridor-Wide Peak | 43% | 39% | 57% | 406 |

Occupancy data on Broad Street between Byrd Avenue and Thompson Street, referred to herein as the West End, was not collected because on-street parking is currently not permitted in this section of the corridor. Similarly, occupancy data along Main Street between 14th Street and 26th Street, referred to herein as the East End, was not collected because BRT impacts to on-street parking in this area are expected to be minimal, confined only to BRT stations and local bus stop relocation.

## Proposed Parking Impacts

The primary causes of impacts to on-street parking include:

- addition of exclusive BRT lanes through areas of the alignment with narrow right-of-way;
- addition of exclusive left-turn lanes;
- median BRT stations;
- curb-side BRT stations at 3rd Street and in the East End;
- new or re-located local route bus stops proposed in the GRTC BRT Technical Assistance Study, a parallel study considering changes to existing local service;
- unsignalized pedestrian crossings maintaining north-south connectivity within median-running segment.

As described above, there will be no parking impact in the West End; however, the section between Thompson Street and 14th Street will be affected by all of the aforementioned parking impacts. Since the BRT will operate in mixed-flow in the East End, on-street parking will only be impacted by construction of curbside BRT stations and relocation of local bus stops.

Estimated on-street parking impacts along Broad Street between Thompson Street and 14th Street are summarized in draft form in **Table 2** below and are illustrated in **Figure 1A** and **Figure 1B**. The

numbers presented in this table are as of the most recent Parking Report, published in July 2015, with adjustments based on the Technical Assistance Study discussed above.

**TABLE 2 – SUMMARY OF PROPOSED ON-STREET PARKING IMPACTS, THOMPSON STREET TO 14TH STREET**

| Subarea | Existing Parking Spaces | Proposed Change in Number of Spaces | Preserved Parking Spaces |
|---|---|---|---|
| Thompson Street to Sheppard Street | 124 | -98 | 26 |
| Sheppard Street to Lombardy Street | 244 | -95 | 149 |
| Lombardy Street to Foushee Street | 246 | -86 | 160 |
| Foushee Street to 4th Street | 38 | 28 | 66 |
| 4th Street to 14th Street | 56 | -56 | 0 |
| **TOTAL** | **708** | **-316** | **401** |

**Table 3** below summarizes the existing on-street parking inventory on the East End of the BRT alignment and proposed impacts to those spaces. **Figure 2A**, **Figure 2B**, and **Figure 2C** illustrate the parking loss documented within this table.

**TABLE 3 – SUMMARY OF PROPOSED ON-STREET PARKING IMPACTS IN THE EAST END**

| Subarea | Existing Parking Spaces | Proposed Change in Number of Spaces | Preserved Parking Spaces |
|---|---|---|---|
| 14th Street from Broad Street to Main Street | 42 | 0 | 42 |
| Main Street from 14th Street to Williamsburg Avenue | 193 | -20 | 173 |
| Main Street from Williamsburg Avenue to Orleans Street | 0 | 0 | 0 |
| Old Main Street from Main Street to Orleans Street | 32 | 0 | 32 |
| Orleans Street from Old Main Street to Main Street | 17 | -10 | 7 |
| **TOTAL** | **284** | **-30** | **254** |

Detailed parking occupancy data by time of day and day of week can be found in the July 2015 Parking Report.

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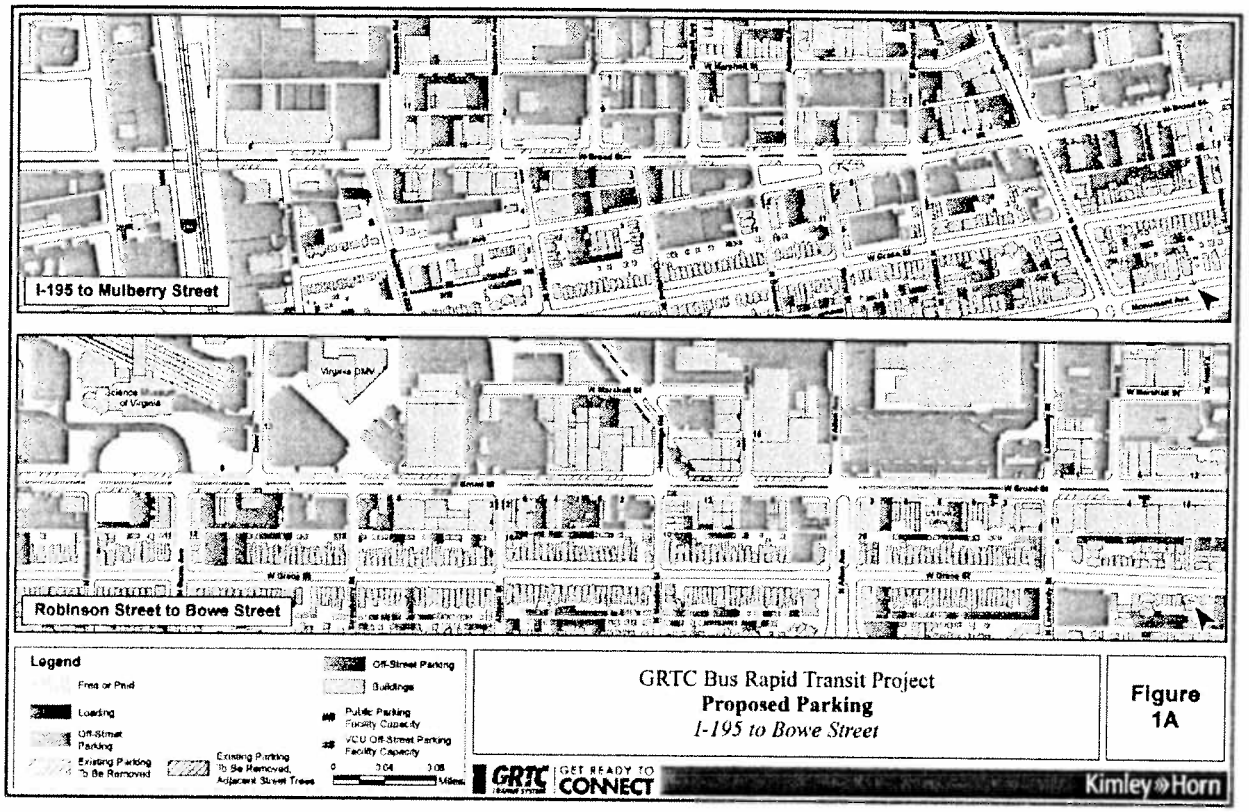
FIGURE 1A – PROPOSED PARKING WITH EXISTING STREET TREES INDICATED WHERE PARKING IS TO BE REMOVED, I-195 TO BOWE STREET

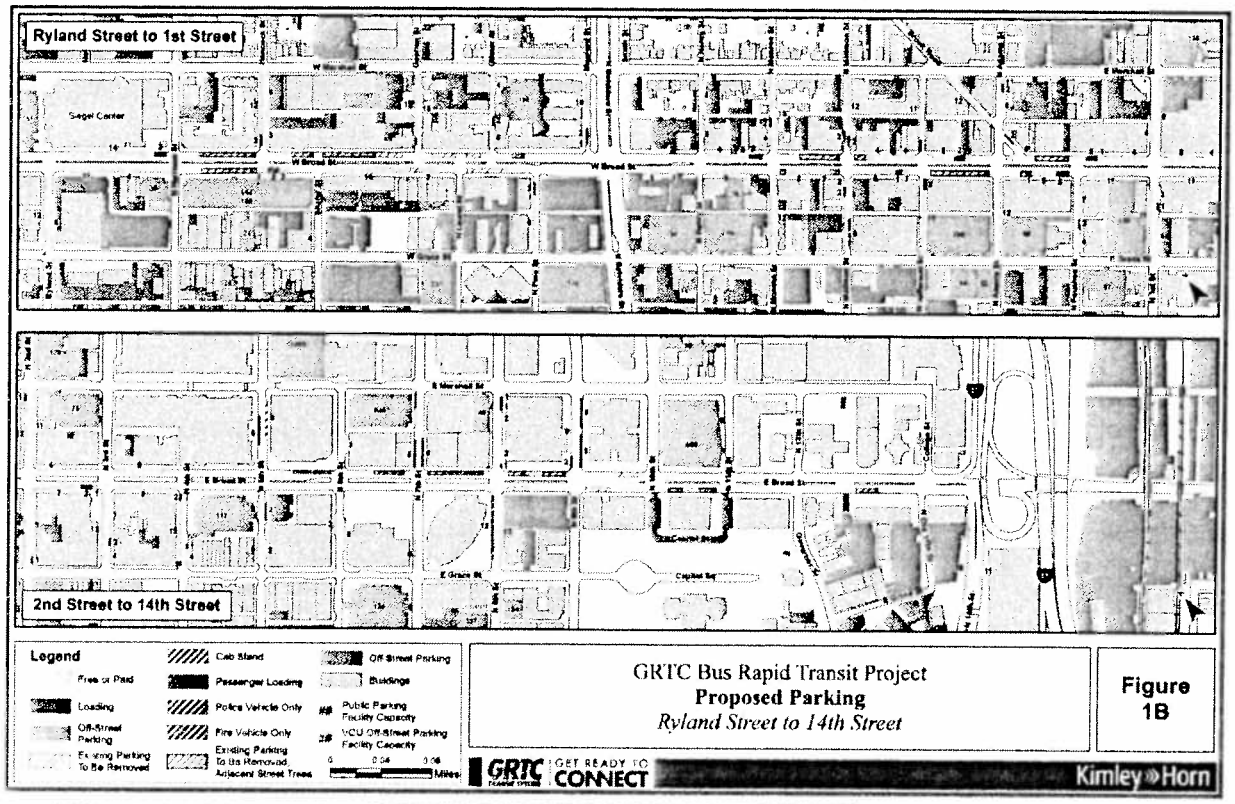





GRTC Bus Rapid Transit Project
**Proposed Parking**
*I-195 to Bowe Street*

**Figure 1A**

FIGURE 18 – PROPOSED PARKING WITH EXISTING STREET TREES INDICATED WHERE PARKING IS TO BE REMOVED, RYLAND STREET TO 14TH STREET



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### Potential for Additional Left-Turn Access

Since the UDC meeting on August 20, 2015, impacts of additional left-turn movements on Broad Street have been studied – eastbound at Summit Street, westbound at Boulevard, and westbound at Lombardy Street. Project stakeholders have agreed to the addition of a westbound left-turn lane at Boulevard. The left turns at Summit Street and Lombardy Street are not recommended.

Adding a westbound left-turn lane at Boulevard would reduce the proposed on-street parking by 6 spaces in order to achieve the proper lane widths and transitions within the existing roadway cross section. This reduction in parking inventory is in addition to the parking loss accounted for within **Table 2**.

### Narrowing and Closing Curb Cuts

A number of unused, redundant, and/or unnecessarily wide curb cuts exist along the BRT corridor. Closing or reducing these curb cuts could result in an increase in on-street parking and improvement in corridor safety through better access management. Locations where this may be possible, pending thorough vetting with property owners and City of Richmond staff, include:

- Eastbound Broad Street between Mulberry Street and Robinson Street
  - Close one of the two eastern most curb cuts for Bank of America; this would require alterations to parking lot and teller lane circulation
- Eastbound Broad Street between DMV Drive and Strawberry Street
  - Close two of four curb cuts for Chicken Fiesta and Arby's; this would require alterations to parking lot and drive-thru circulation and may require a shared use agreement
- Eastbound Broad Street between Allison Street and Meadow Street/Hermitage Road
  - Close one curb cut between car rental business and the Mansion Room at Fielden's private club; this small private lot can be accessed from the alley
- Westbound Broad Street between Lombardy Street and Allen Street
  - Close one of two curb cuts for the Sunoco/Fast Break Store
  - Close one of two curb cuts for Lowe's, which has two other access points
- Eastbound Broad Street between Belvidere Street and Henry Street
  - Reduce width or close larger of two curb cuts in front of former Hess station, now VCU property
  - Close curb cut in front of former restaurant, which has two access points on Henry Street

### Converting Pine Street to One-Way

The City of Richmond is pursuing conversion of the two-way section of Pine Street to one-way. There are currently nine on-street parking spaces, six free and three loading, along Pine Street between Grace Street and Broad Street. Converting this street to one-way could allow another ten to twelve on-street parking spaces in the VCU area, where on-street parking demand is very high.

### Sidewalk Buffer

Street trees, planters, bicycle racks, and other permanent fixtures between the sidewalk and roadway provide a buffer that enhances the streetscape experience for pedestrians. On-street parking also provides a buffer between the sidewalk and the roadway that enhances pedestrian comfort by creating a feeling of separation between moving vehicular traffic and pedestrians. **Figure 1** indicates the parking spaces currently proposed between Thompson Street and 14th Street, the spaces that are proposed to be removed, and the locations where parking is proposed to be removed and street trees are already in place. The City of Richmond will address buffer areas via streetscape projects separate from the BRT Project.

### Parking Mitigation Plan

The City of Richmond will prepare a parking mitigation plan to address impacts to on-street parking along the BRT corridor. This plan will address proposed changes to the City of Richmond Parking Ordinances. Concepts like hourly parking regulations, shared parking, wayfinding and signage, payment and validation strategies, pricing, technology, and coordinated management will be evaluated and employed as needed upon completion of BRT construction. The BRT planning team recommended that the City of Richmond modify parking signage in areas of high occupancy to indicate shared-use parking by time-of-day for loading zones and for customer parking. The BRT planning team also recommended an evaluation of parking regulations along the BRT corridor to provide the most effective daytime parking turnover rates for businesses and nighttime parking availability for residents. Additionally approximately 35 off-street spaces have been identified for public parking in a proposed VCU parking lot at Broad Street and Harrison Street.

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FIGURE 2A - EAST END PARKING IMPACTS DUE TO BRT STATION PLATFORMS


FIGURE 2B – EAST END PARKING IMPACTS DUE TO BRT STATION PLATFORMS

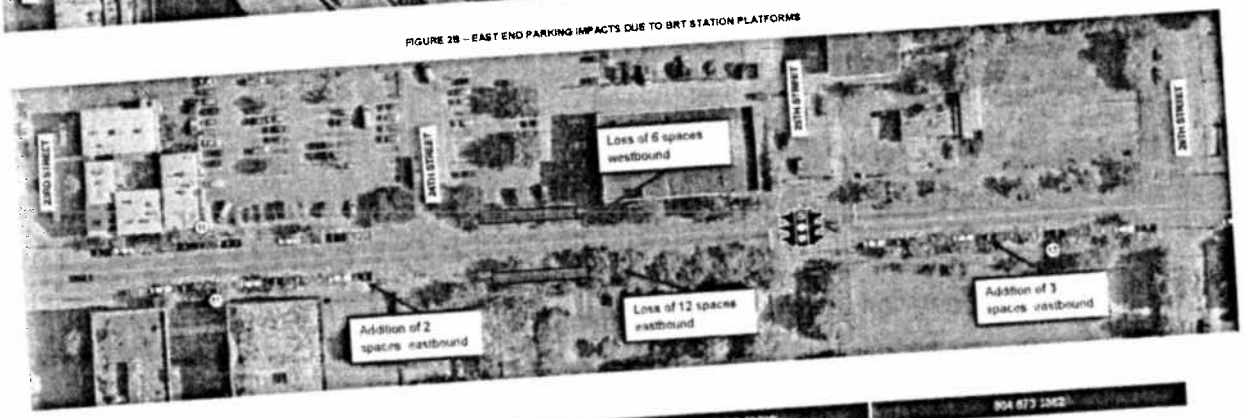

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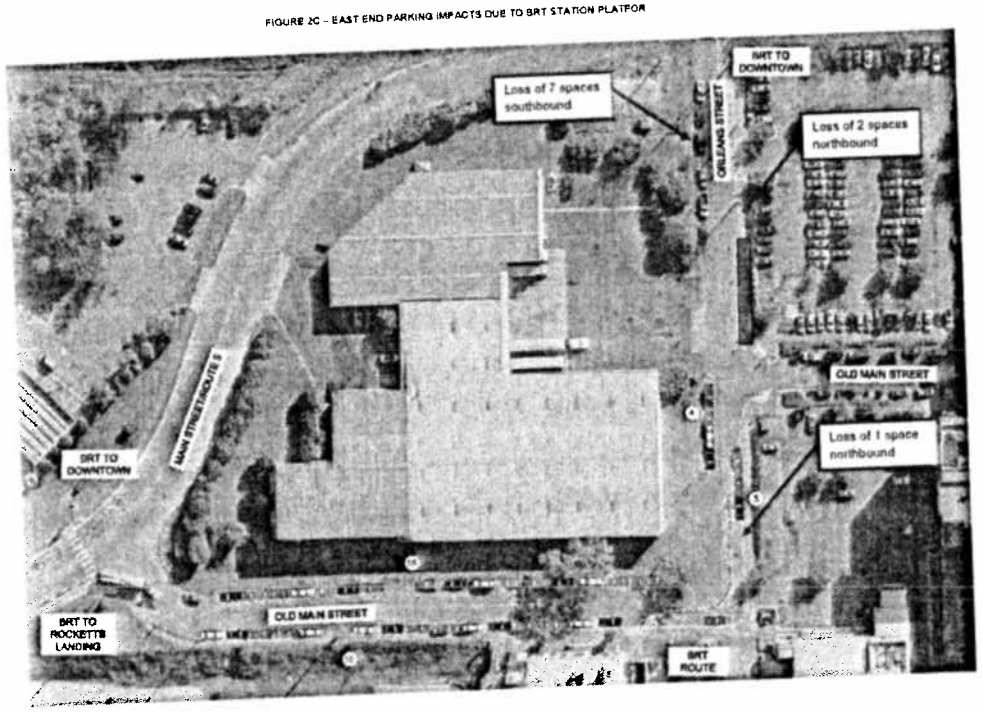
FIGURE 2C – EAST END PARKING IMPACTS DUE TO BRT STATION PLATFOR



Kimley»Horn

October 15, 2015

To: Urban Design Committee, City of Richmond

RE: *Left-Turn Allowances for GRTC Bus Rapid Transit Project*

**UDC/PC Comment 3 and 23:**

- That a review of the 60% design stage include connectivity to the neighborhoods, access to the Scott's Addition particularly at Summit Avenue, and the median running design of the system

- That the BRT planning team continues to study opportunities to provide additional left turn movements from Broad Street, particularly at N. Boulevard and N. Lombardy Street, fully recognizing the impact to parking totals and the important role that parking provides as a buffer for pedestrians from moving travel lanes

**Applicant Response:**

- An eastbound left-turn lane is not recommended at Summit Avenue. The path of an eastbound left-turn movement at Summit Avenue would cross into the proposed BRT station. The proposed station cannot be relocated due to an adjacent high pressure gas line running beneath Broad Street.

- A westbound left-turn lane is not recommended at Lombardy Street. A turn lane at Lombardy Street would be costly, require reduction of existing sidewalk width by 3-4 feet, and cause poor traffic operations in the short block between Lombardy Street and Bowe Street. Left-turning traffic will become trapped between the two intersections without an opportunity to make a permissive left-turn at the end of the Broad Street signal phase, potentially extending beyond the dedicated turn lane during the peak hours.

- A westbound left-turn movement from Broad Street onto N. Boulevard is recommended during the off-peak periods. A westbound left-turn will be prohibited from 7:00 AM to 9:00 AM, and from 4:00 PM to 6:00 PM Monday through Friday, but allowed at all other times, pending further detailed traffic analysis. This left-turn movement supports access to major cultural attractions including the VMFA, Historical Society, and Byrd Park as well as preserves the land use patterns on this ceremonial street.

## SUPPORTING DOCUMENTATION

Left-turn movements along the Broad Street corridor currently occur from shared left/through lanes. Vehicles often queue in the shared left/through lanes while turning vehicles wait for a gap in opposing traffic, forcing through traffic to utilize the two outside lanes to efficiently move through the corridor. Since the BRT project will eliminate the inside shared left/through lanes between Thompson Street and Foushee Street to accommodate exclusive BRT lanes, alternate left-turn accommodations were considered.

Turning movement count data was collected in October 2014 at 29 intersections along the proposed BRT alignment. These traffic counts were supplemented by traffic counts performed in October 2008 as part of the City's Retiming of Traffic Signals Phase III program. Not all intersections were counted again in 2014 since traffic volumes and patterns in the study area remained relatively stable, and 2008 data could be balanced with 2014 data. Count data allowed the study team to better assess demand for left-turn access at various locations along the BRT corridor.

Left-turn accommodations from Thompson Street to Foushee Street (where the BRT buses will operate in dedicated median transit lanes) were carefully considered for efficient movement of traffic, safety, and neighborhood and business access. For efficient movement of traffic, exclusive left-turn lanes should be constructed to provide storage for left-turn queues and minimize congestion in the adjacent through lane. For safety, left-turn movements across dedicated transit guideways should occur at signalized intersections and use protected-only left-turn phasing, as documented in the American Public Transportation Association (APTA) Recommended Practice "Designing Bus Rapid Transit Running Ways." Protected left-turn phasing is recommended in order to prevent driver interactions with head-on vehicular traffic, head-on BRT vehicles, and BRT vehicles approaching from behind. In mixed-flow or curb running segments of the corridor, there will no reduction of left-turn access.

Based on a detailed review of existing traffic volumes and operations between Thompson Street and Foushee Street as well as community input received from numerous public meetings, it is recommended that left-turn movements from exclusive left-turn lanes be allowed at the following locations:

- Eastbound left turn at Roseneath Road
- Westbound left turn at Tilden Street
- Eastbound and westbound left turns at Sheppard Street
- Eastbound left turn at Terminal Place
- Westbound left turn at Robinson Street
- Eastbound left turn at Davis Avenue
- Eastbound left turn at DMV Drive
- Eastbound left turn at Allison Street
- Eastbound and westbound left turns at Hermitage Road/Meadow Street
- Eastbound left turn at Allen Avenue
- Eastbound left turn at Bowe Street

- Westbound left turn at Harrison Street
- Eastbound and westbound left turns at Belvidere Street
- Westbound left turn at Monroe Street

Three additional locations for exclusive left-turn lanes were investigated for feasibility.

- Eastbound left turn at Summit Avenue
- Westbound left turn at Lombardy Street
- Westbound left turn at Boulevard Avenue

## Eastbound Left Turn at Summit Avenue (Scott's Addition access)

An eastbound left-turn movement at Summit Avenue would provide access into Scott's Addition. Scott's Addition is located north of Broad Street while the Museum District is located south of Broad Street, each lying between I-195 and Boulevard. The BRT station was strategically located to balance left-turn access to both neighborhoods with convenient transit accessibility. Currently, there are proposed eastbound left-turn movements for access to Scott's Addition at Roseneath Road and at Sheppard Street. There are proposed westbound left-turn movements for access to the Museum District at Sheppard Street and Tilden Street.

An eastbound left turn is not recommended for Summit Avenue. The path of an eastbound left-turn movement at Summit Avenue would cross into the proposed BRT station. The raised concrete median for the station extends beyond Summit Avenue, as denoted by the grey marking in Figure 1. Additionally, the BRT station location physically prevents a traffic signal at Summit Avenue, which would also be required to accommodate an eastbound left-turn onto Summit Avenue. The BRT station cannot be relocated due to the presence of a high pressure gas line to the west of Cleveland Street, located along Broad Street and Highpoint Avenue which poses safety risks to a potential BRT station. City Transportation and Planning staff acknowledge that circulation in Scott's Addition could be improved; therefore, a circulation study for Scott's Addition is being considered separate from the GRTC BRT Project.

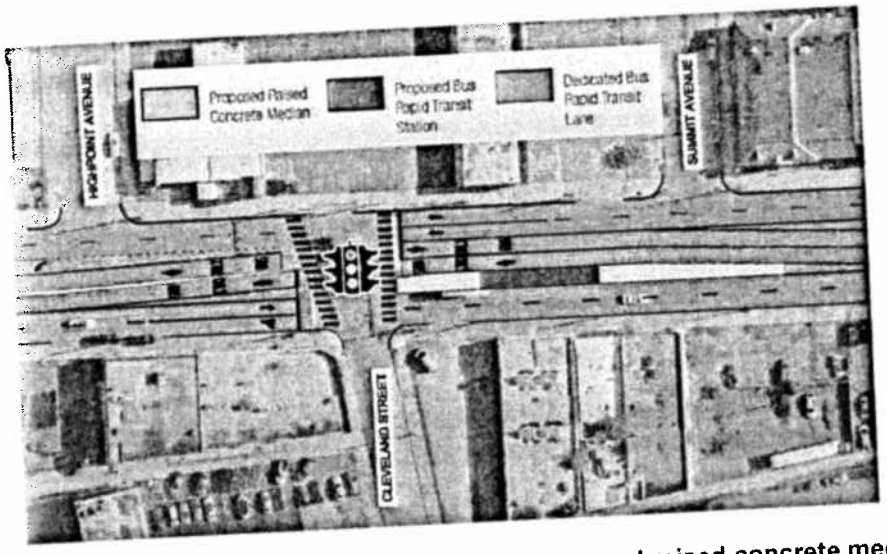



**Figure 1. The location of the proposed BRT station and raised concrete median extended beyond Summit Avenue.**

Several jughandle options were considered as an alternative to an exclusive left-turn lane on Broad Street at Summit Avenue. A jughandle is a slip road on the right side of the main roadway prior to an intersection. Left-turning traffic is diverted onto the slip road to turn left, as illustrated in Figure 2. Jughandle configurations were considered at Summit Avenue, Altamont Avenue, and Wayne Street (via Cutshaw Avenue) to provide access into Scott's Addition. However, in all three instances property acquisition would be required. The project's Transportation Investment Generating Economic Recovery (TIGER) Grant will not allow for property acquisition. Therefore, a long-term solution should be pursued for Scott's Addition separate from the GRTC BRT Project.

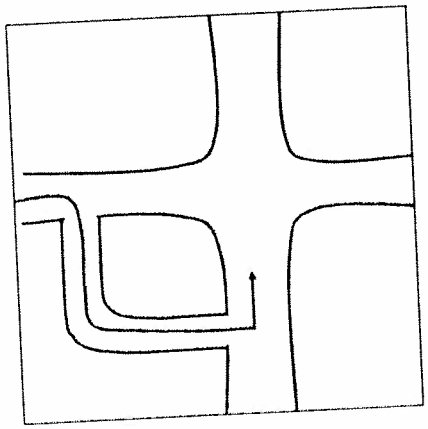


**Figure 2. A simple jughandle intersection configuration sketch.**

## Westbound Left Turn at Lombardy Street

A westbound left-turn movement at Lombardy Street would provide access to the Fan District which is located south of Broad Street between Boulevard and Belvidere Street. Westbound left-turn access into the Fan District is currently proposed at Robinson Street, Hermitage Road/Meadow Street, and Harrison Street.

The minimum required travel lane, parking lane, and median widths are currently proposed at Lombardy Street; therefore construction of a left-turn lane at this intersection would require acquiring approximately 3-4 feet of sidewalk space, as shown in Figure 3. Construction of a left-turn lane would involve widening Broad Street to one side at a cost of approximately $200,000. A major component of this cost is the relocation of two traffic signal poles, two light poles, and one drainage drop inlet.

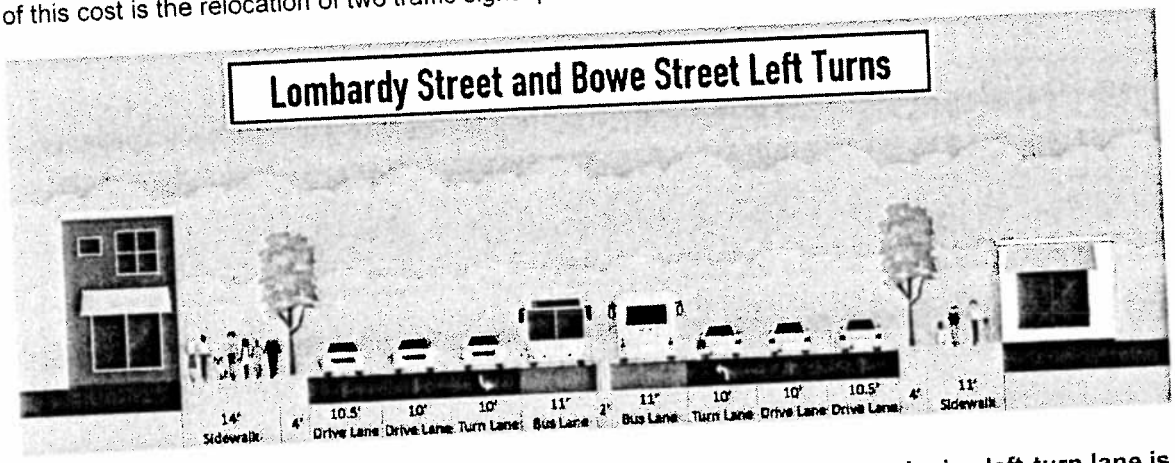



**Figure 3. The cross-section of Broad Street at Lombardy Street if an exclusive left-turn lane is installed. Note lanes are at minimum require widths and sidewalk space must be acquired on one side of the roadway.**

In addition to sidewalk width reductions and project cost implications, traffic flow is a concern in this congested area of the BRT corridor. There is approximately 270 feet between Lombardy Street and Bowe Street. The close proximity of these two intersections will result in inefficient traffic flow if both intersections include simultaneous protected left-turn phases. Left-turning traffic will become trapped between Lombardy Street and Bowe Street without an opportunity to make a permissive left-turn at the end of the Broad Street signal phase. This operation will result in accommodating only left-turn traffic that is stored between the two intersections at the beginning of the left-turn phase. Left-turn traffic that is not accommodated during the protected phase would be served in the next signal cycle resulting in additional queuing, potentially extending beyond the dedicated turn lane during the peak hours. Additionally, a decision was made to install an eastbound left-turn at Bowe Street since the existing eastbound left-turn volume turning onto Bowe Street is greater than the existing westbound left-turn volume turning onto Lombardy Street. For these reasons, a westbound left-turn movement is not recommended at Lombardy Street.

## Westbound Left Turn at Boulevard

A westbound left-turn movement at Boulevard would support access to major cultural attractions including the Virginia Historical Society, Virginia Museum of Fine Arts, Byrd Park, and Maymont as well as preserve the land use patterns along this ceremonial street. However, the addition of a westbound left-turn phase and dedicated turn lane combined with BRT median running operation will result in on-street parking loss and level of service (LOS) degradation from a LOS E to a LOS F. The delay and LOS for the intersection of Broad Street at Boulevard with and without a westbound left-turn phase is shown in Table 1. A 90 second cycle was assumed per direction of City Transportation staff.

**Table 1. Delay and Level of Service (LOS) of Broad Street at Boulevard Avenue with and without an exclusive westbound left-turn lane (worst-case PM peak hour)**

| Options for Broad Street at Boulevard | Delay | Level of Service | Notes |
|---|---|---|---|
| 90 second cycle | 63.3 | E | -- |
| 90 second cycle with westbound left-turn onto Boulevard | 114.3 | F | Addition of left-turn lane, signal phase and additional timings required for this phase pushes the intersection over-capacity. |

The advantages of a westbound left-turn lane at Boulevard are as follows:

- More access for vehicles to historical locations and to attractions such as the Virginia Museum of Fine Arts
- Shorter queue lengths at both Boulevard and Sheppard

The disadvantages of a westbound left-turn lane at Boulevard are as follows:

- Additional loss of parking (approximately 13 additional parking spaces)
- Additional signal phase and therefore an increased cycle length will cause more pedestrian delay on some approaches and along the corridor
- Left-turn only phase will reduce green time for the Pulse BRT

Time of day restrictions on a westbound left-turn movement at Boulevard would be feasible and consistent with existing operations along Boulevard south of Broad Street.

Based on the advantages and disadvantages of left-turn access, it was determined by City Planning and Transportation staff to allow a westbound left-turn from Broad Street onto Boulevard during the off-peak periods. Essentially, a westbound left-turn will be prohibited from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM Monday through Friday and allowed at all other times, pending further detailed traffic analysis.

October 2, 2015

City of Richmond
Urban Design Committee
900 East Broad Street
Room 510
Richmond, VA 23219

**RE: Response to UDC/Planning Commission Comments from September 9, 2015 PC Meeting Minutes**

**UDC/PC Comment #4:** ***That the final plans include details for each station showing the dimensions, materials and finishes of all structural components and amenities.***

**Applicant Response:** The design team has begun to prepare bridging documents that will enable the BRT project to advance under a design build method of procurement.

City of Richmond Administrative Directive titled "GRTC Bus Stops, Amenities and Routes: Process for changes in the City of Richmond" should be followed.

## SUPPORTING DOCUMENTATION

None

October 2, 2015

City of Richmond
Urban Design Committee
900 East Broad Street
Room 510
Richmond, VA 23219

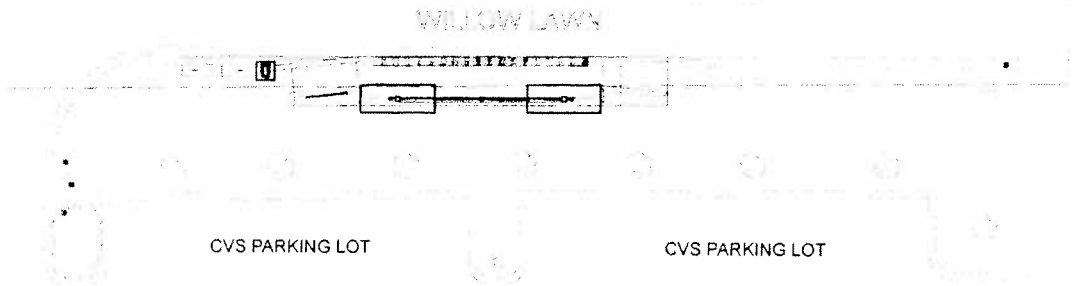
**RE: Response to UDC/Planning Commission Comments from September 9, 2015 PC Meeting Minutes**

UDC/PC Comment#5: ***That the final plans show the location of each station and the businesses/buildings adjacent to them to determine the impact of the station on the adjacent private properties.***

Applicant Response: The design team has prepared documentation showing the location of each station and the businesses/buildings adjacent to them.

## SUPPORTING DOCUMENTATION

See attached 11 x 17 plans (26 pages).



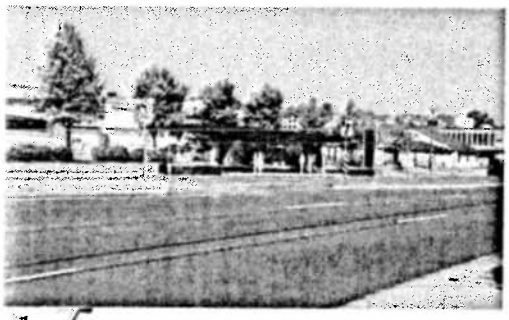

## WILLOW LAWN

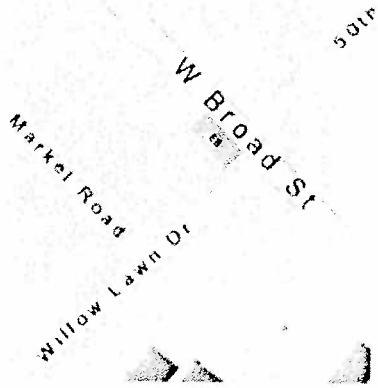
**Location:**
Station located on the south side of W. Broad Street just west of the intersection with Willow Lawn Drive

**Adjacent Property Descriptions:**
The property adjacent to the station is a parking lot for a CVS Drugstore.

The design team met with the property owner (The Rebkee Company) and tenant (CVS) and presented the location of the station and conceptual design. Both the property owner and tenant have indicated their acceptance of the facility.

The station will occupy the entire width of the sidewalk and pedestrians will walk through the station.



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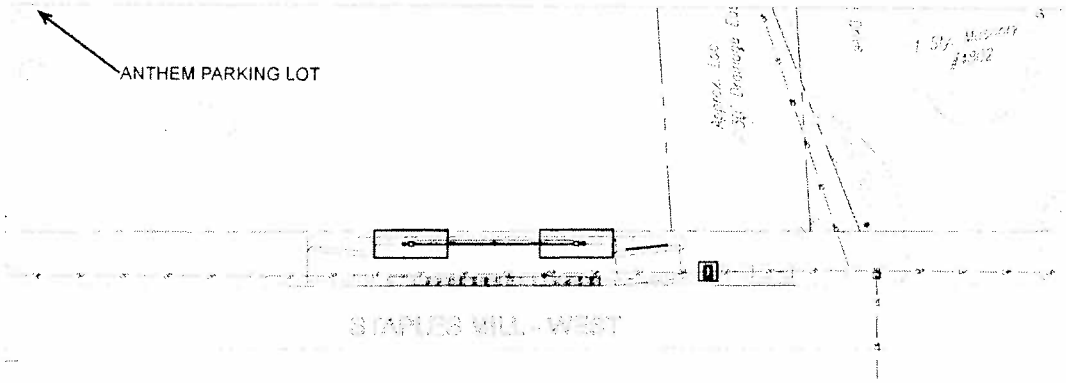


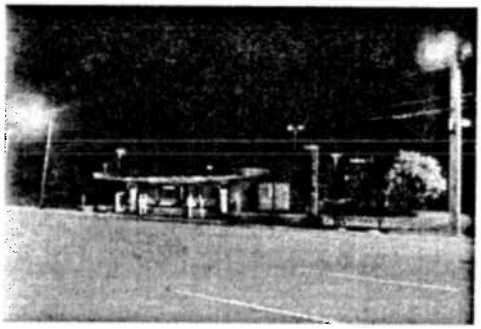

## STAPLES MILL - WEST

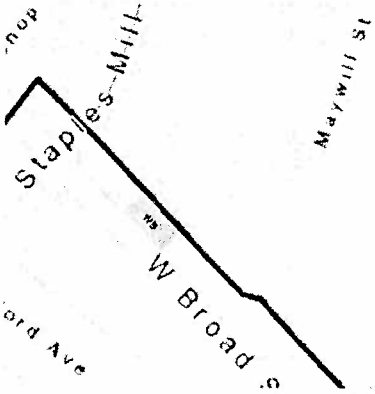
**Location:**
Station located on the north side of W. Broad Street, west of Chantilly Street.

**Adjacent Property Descriptions:**
The property located adjacent to the station is a parking lot for Anthem.

The design team contacted Anthem and drawings were sent for their review. Anthem has indicated their acceptance of the facility.

The Station will occupy the entire width of the sidewalks and pedestrians will walk through the station.





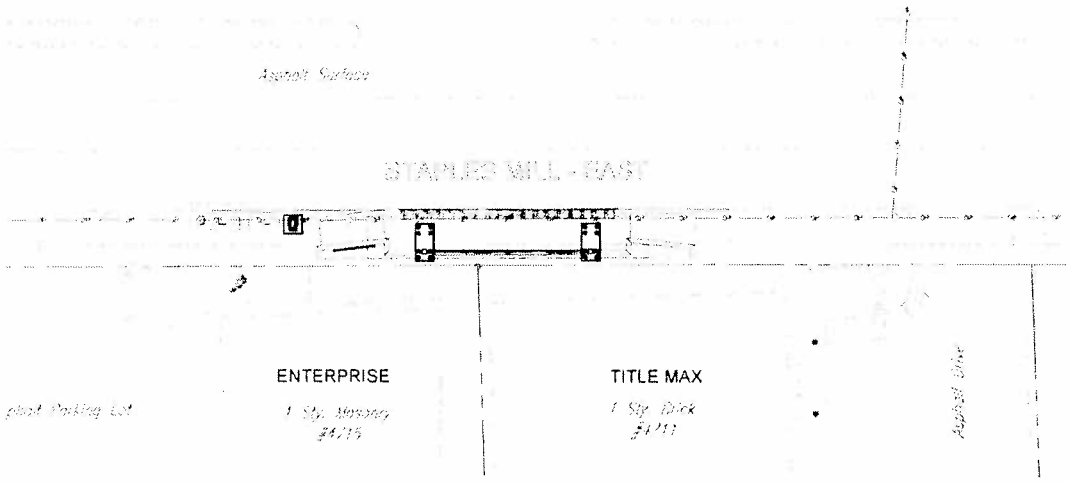
## STAPLES MILL - EAST

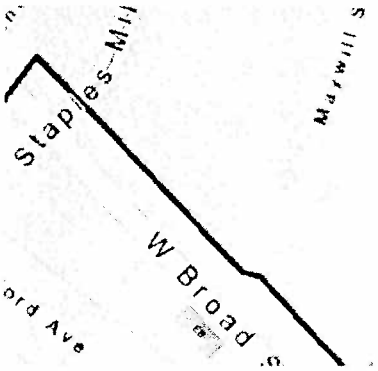
**Location:**
Station located on the south side of W. Broad Street, 200 feet east of Chantilly Street.

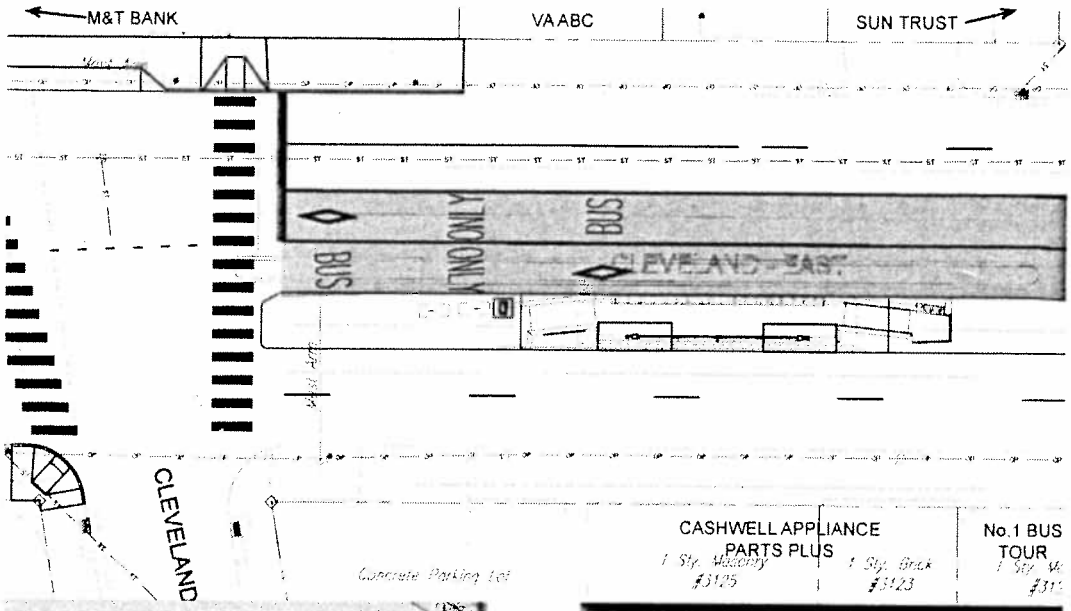
**Adjacent Property Descriptions:**
The property located adjacent to the station contains two buildings. One is occupied by Enterprise Car Rental and the second building is occupied by a Title Max store. Both buildings have their main entrances on the side and neither has an entrance facing Broad Street.

The design team contacted the property owners and met with the tenants (Enterprise and Title Max). Enterprise and Title Max have indicated their acceptance of the facility.

The station will occupy the entire width of the sidewalk and pedestrians will walk through the station.



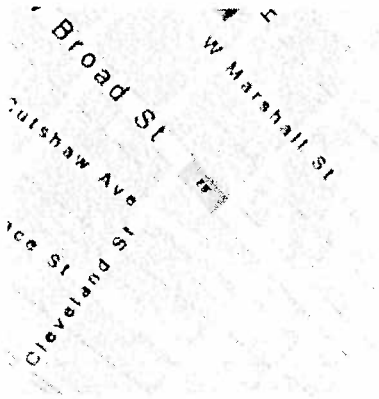


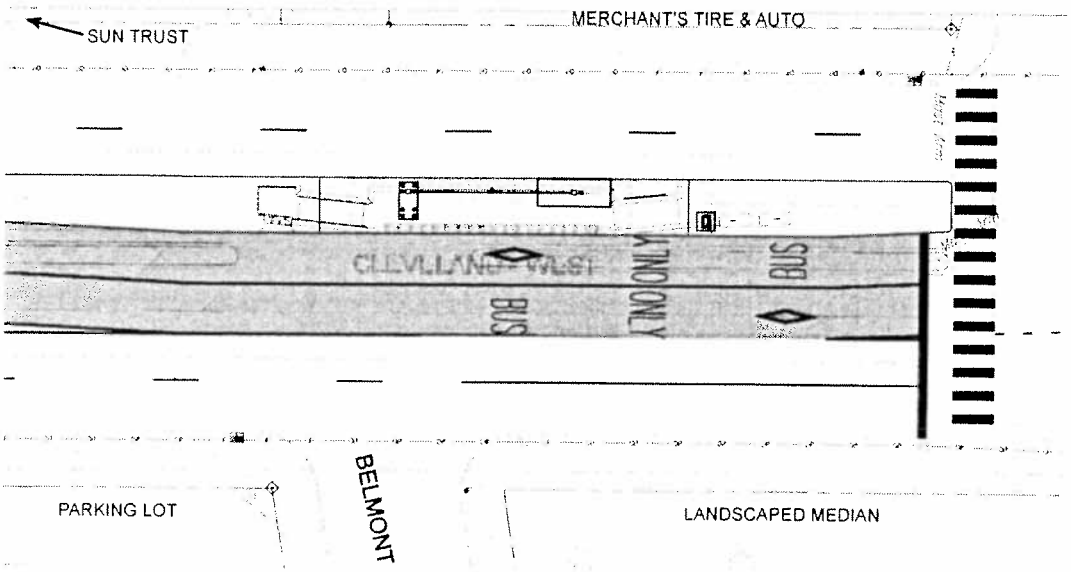

## CLEVELAND - EAST

**Location:**
Station located in W. Broad Street median between Cleveland St and Summit Ave.

**Adjacent Property Descriptions:**
Surrounding properties include a Virginia ABC Store, a SunTrust Bank building, an M&T Bank building, a parking lot, a private intercity bus station and office and an appliance store.

Property owners were contacted by GRTC by mail and tenants were visited by GRTC staff in person. No objections to the station were expressed.



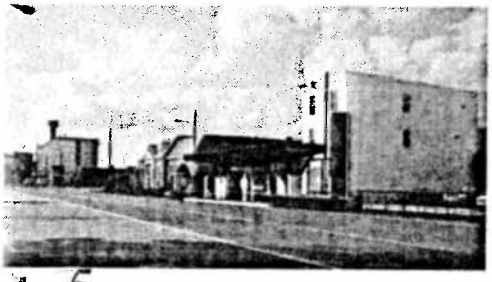


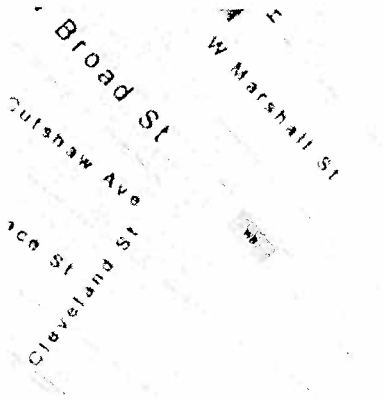

## CLEVELAND - WEST

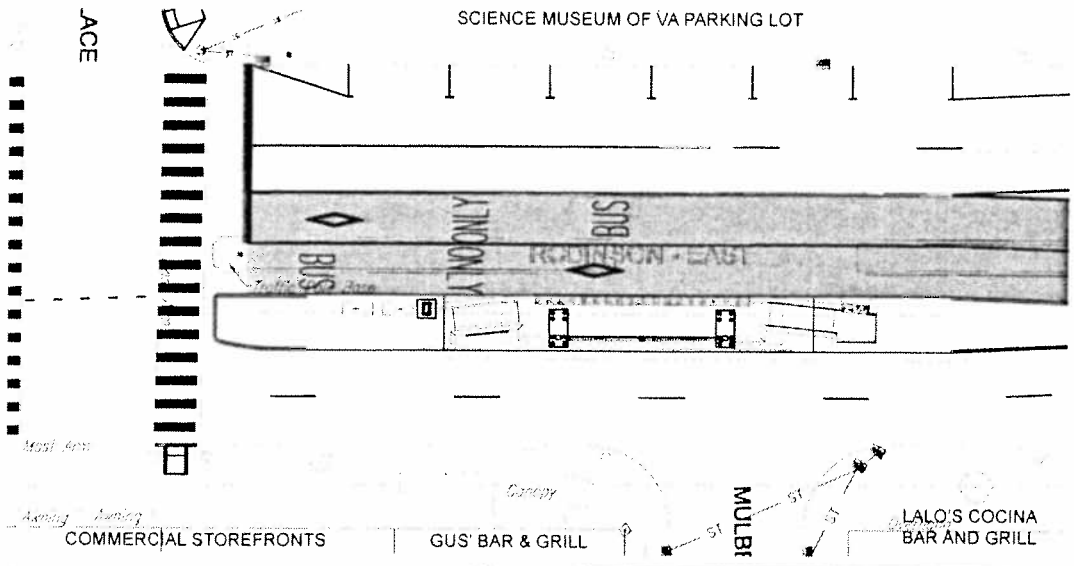
**Location:**
Station located in W. Broad Street median between N. Belmont Ave and Altamont Ave.

**Adjacent Property Descriptions:**
Surrounding properties include a Merchant's Tire & Auto, a SunTrust Bank building, a parking lot and a landscaped median.

Property owners were contacted by GRTC by mail and tenants were visited by GRTC staff in person. No objections to the station were expressed.





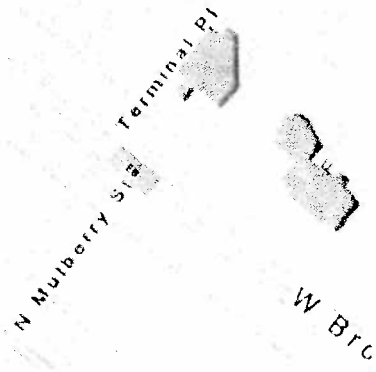



## ROBINSON - EAST

**Location:**
Station located in W. Broad Street median at N. Mulberry St.

**Adjacent Property Descriptions:**
Surrounding properties include the parking lot for the Science Museum of Virginia to the north, Gus' Bar and Grill, Lalo's Cocina Bar and Grill to the south.

Property owners were contacted by GRTC by mail and tenants were visited by GRTC staff in person. A meeting was held with the Science Museum of Virginia who has indicated their support for the station. No objections to the station were expressed.

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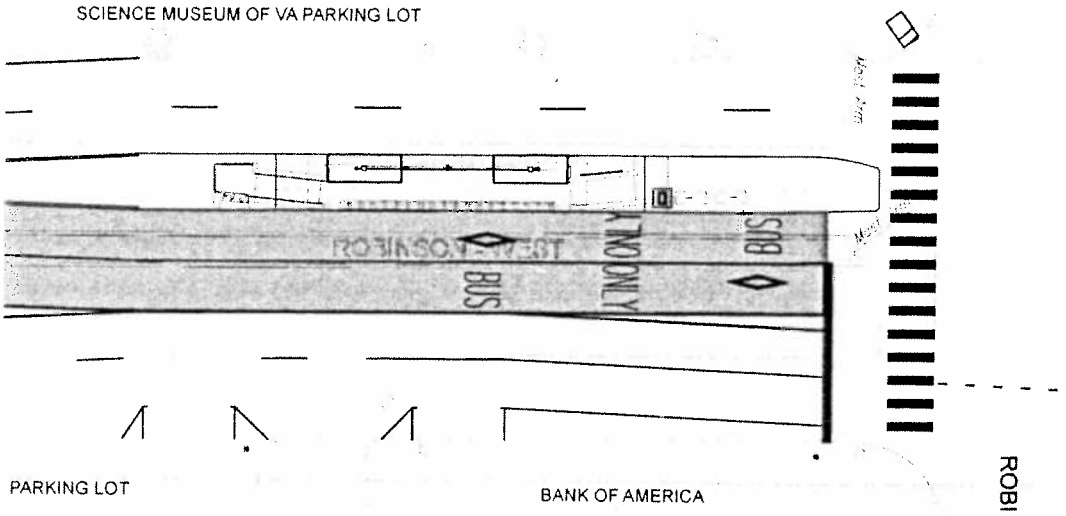
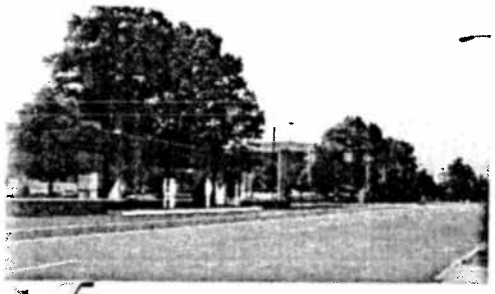


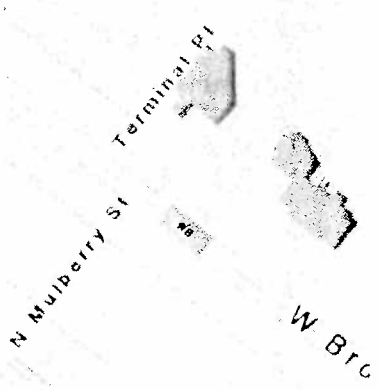

## ROBINSON - WEST

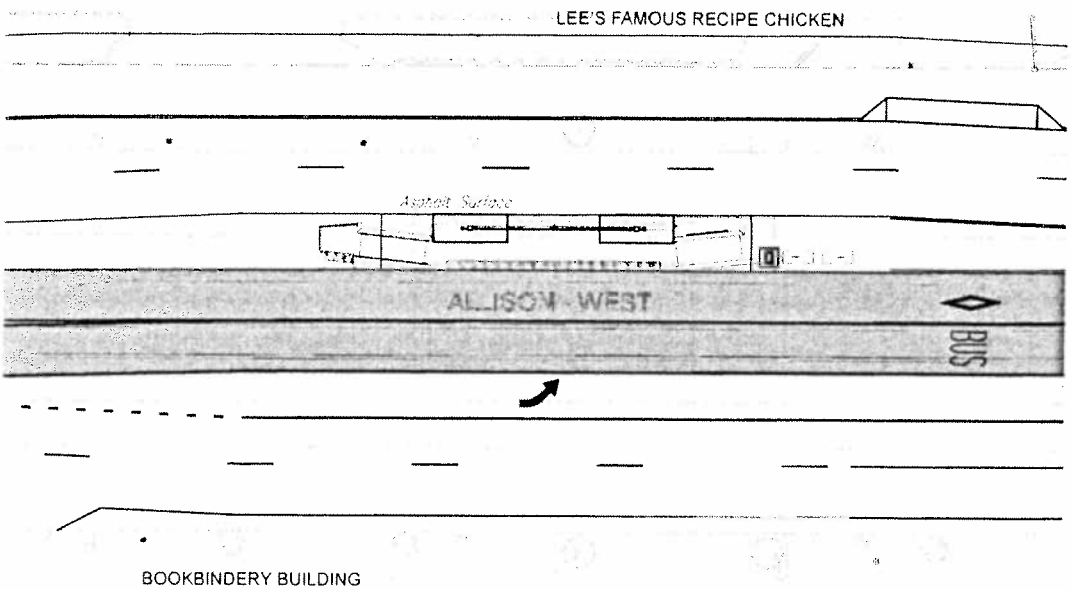
**Location:**
Station located in W. Broad Street median just west of Robinson Street.

**Adjacent Property Descriptions:**
Surrounding properties include the parking lot for the Science Museum of Virginia to the north, a Bank of America Building and Lalo's Cocina Bar and Grill to the south.

Property owners were contacted by GRTC by mail and tenants were visited by GRTC staff in person. A meeting was held with the Science Museum of Virginia who has indicated their support for the station. No objections to the station were expressed.







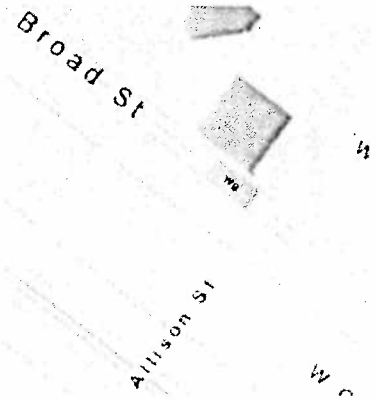

BOOKBINDERY BUILDING

## ALLISON - WEST

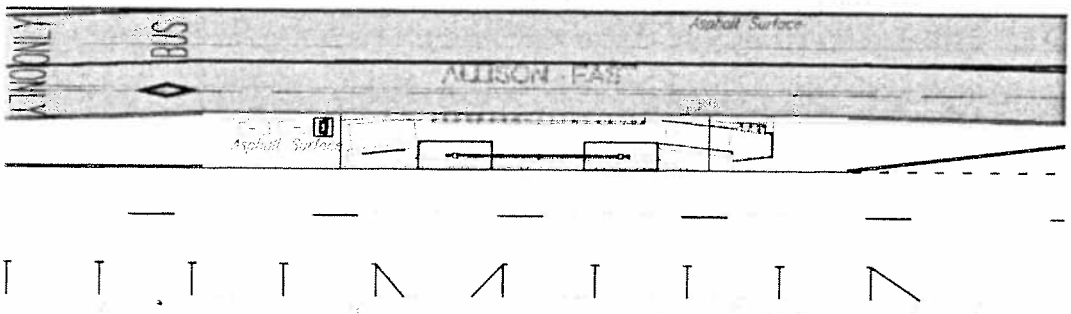
**Location:**
Station located in W. Broad Street median just west of N. Allison Street.

**Adjacent Property Descriptions:**
Surrounding properties include the Bookbindery Building, a Lee's Famous Recipe Chicken restaurant, and Renaissance Hair Salon.

Property owners were contacted by GRTC by mail and tenants were visited by GRTC staff. Meetings were held with Sauer Company and changes were made to accommodate concerns. One tenant, Savory Grain Coffee Shop has expressed opposition to the BRT project. No objections to the station were expressed by the other owners or tenants.



PLEASANTS HARDWARE PARKING LOT



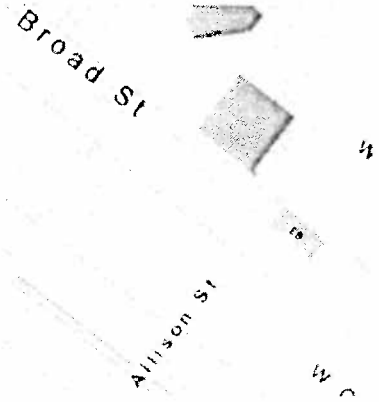


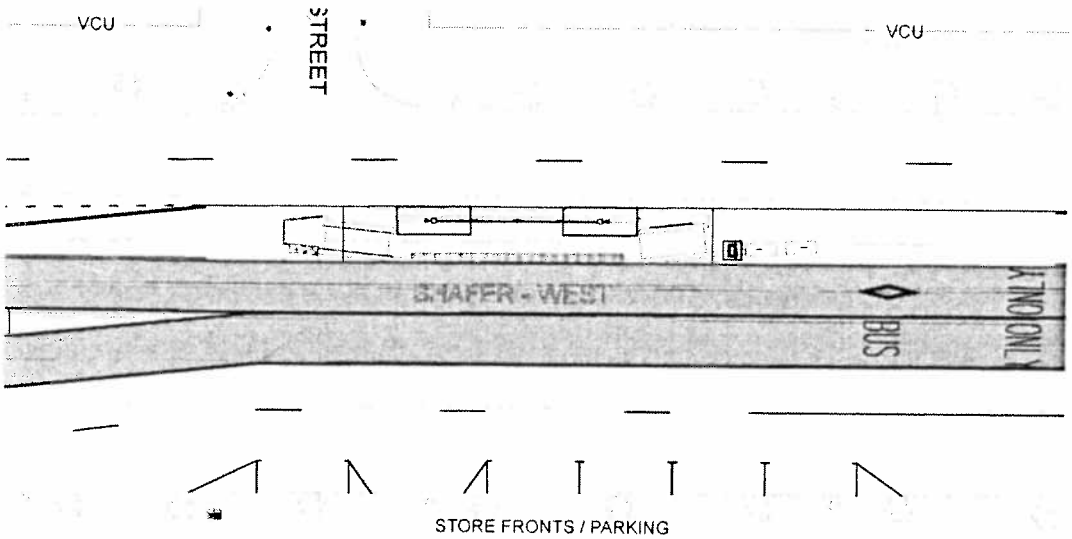
## ALLISON - EAST

**Location:**
Station located in W. Broad Street median just west of N. Allison Street.

**Adjacent Property Descriptions:**
Surrounding properties include a Pleasants Hardware Store (closed) parking lot, the Bookbindery Building, a Lee's Famous Recipe Chicken restaurant, and Renaissance Hair Salon.

Property owners were contacted by GRTC by mail and tenants were visited by GRTC staff. Meetings were held with Sauer Company and changes were made to accommodate concerns. One tenant, Savory Grain Coffee Shop has expressed opposition to the BRT project. No objections to the station were expressed by the other owners or tenants.



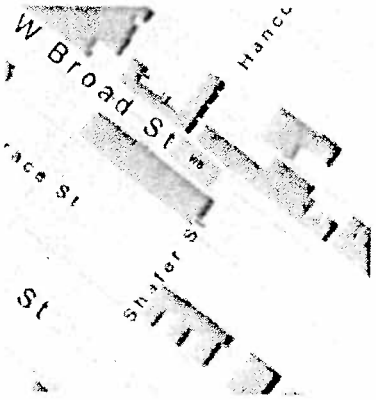



## SHAFER - WEST

**Location:**
Station located in W. Broad Street median just west of Shafer Street.

**Adjacent Property Descriptions:**
Surrounding properties include a parking deck with store fronts and buildings owned by Virginia Commonwealth University.

Property owners were contacted by GRTC by mail and tenants were visited by GRTC staff in person. Multiple meetings were held with VCU. No objections to the station were expressed.

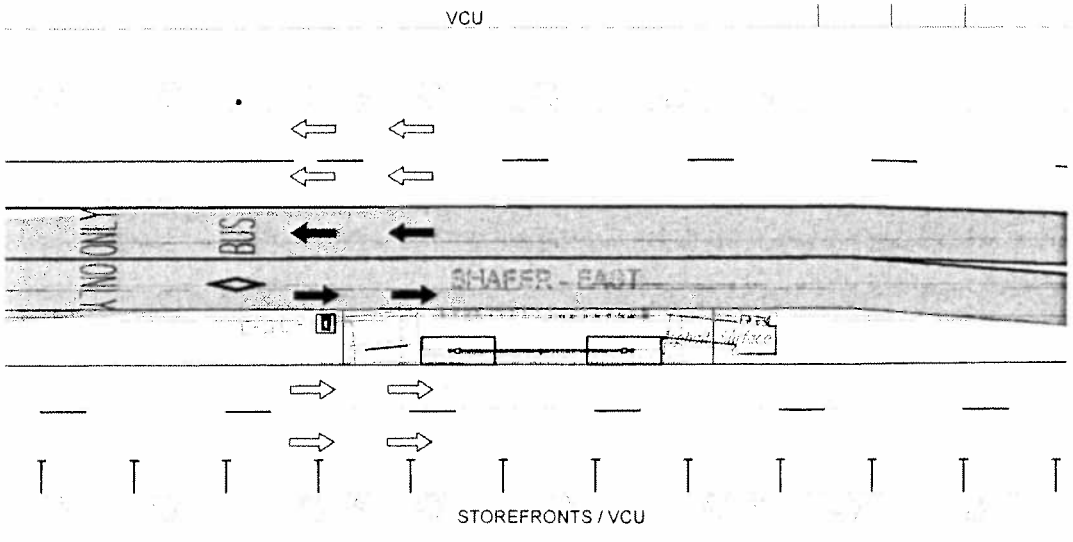


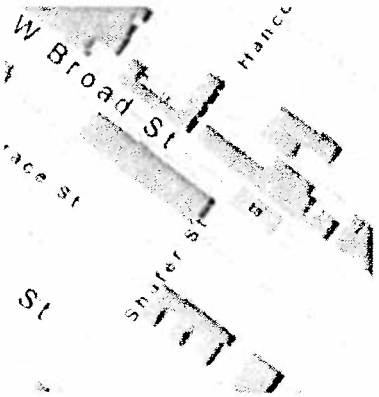
## SHAFER - EAST

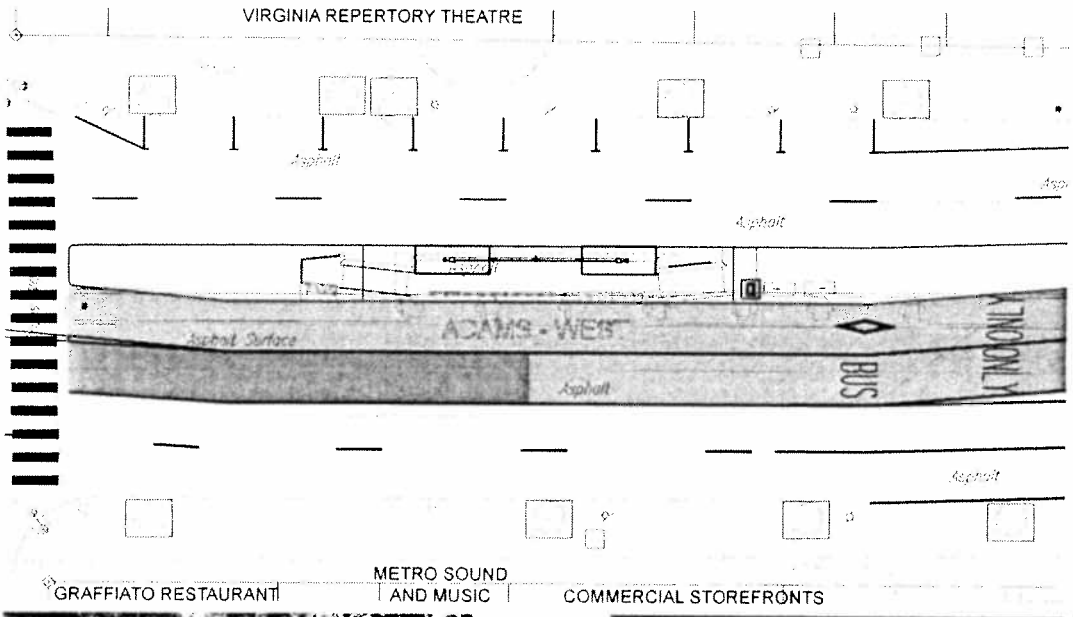
**Location:**
Station located in W. Broad Street median just east of Shafer Street.

**Adjacent Property Descriptions:**
Surrounding properties include a parking deck with store fronts and buildings owned by Virginia Commonwealth University.

Property owners were contacted by GRTC by mail and tenants were visited by GRTC staff in person. Multiple meetings were held with VCU. No objections to the station were expressed.






## ADAMS - WEST

**Location:**
Station located in W. Broad Street median between N. Jefferson Street and N. Adams Street.

**Adjacent Property Descriptions:**
Surrounding properties include VA Repertory Theatre, a small mini park, and several buildings with commercial storefronts.

Property owners were contacted by GRTC by mail and tenants were visited by GRTC staff in person. No responses to the letters were received. A tenant of one of the storefronts (Renovation Resources) has indicated concerns with the station location through direct contact with GRTC.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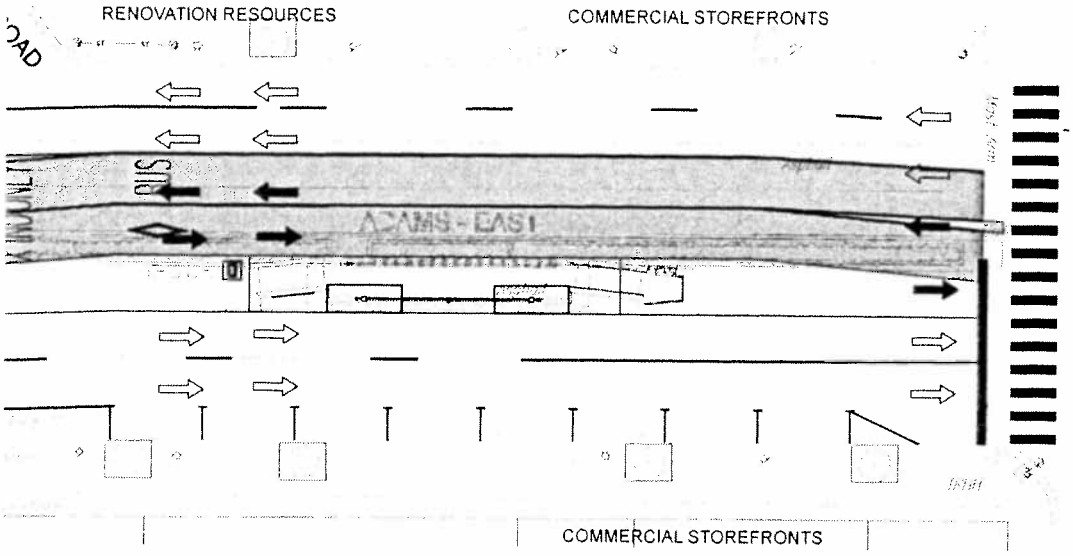
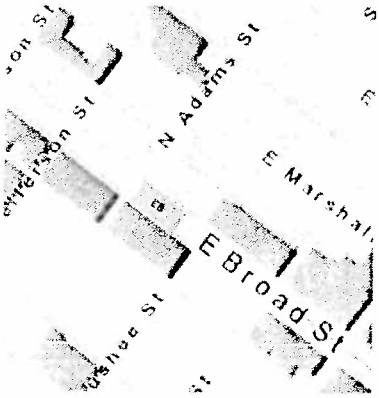



## ADAMS - EAST

**Location:**
Station located in W. Broad Street median just east of N. Adams Street at Brook Road.

**Adjacent Property Descriptions:**
Surrounding properties include a small mini park, and several buildings with commercial storefronts including Renovation Resources.

Property owners were contacted by GRTC by mail and tenants were visited by GRTC staff in person. A tenant of one of the storefronts (Renovation Resources) has indicated concerns with the station location.

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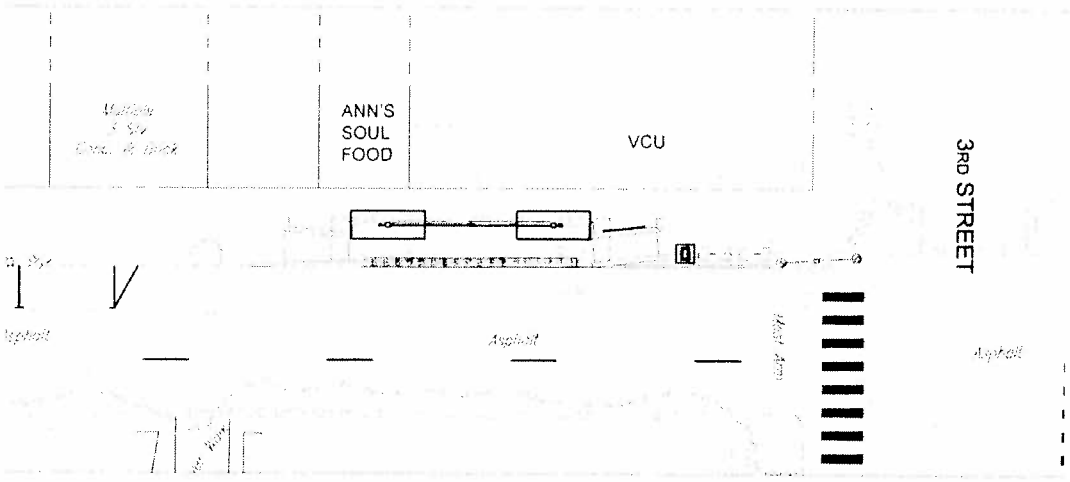


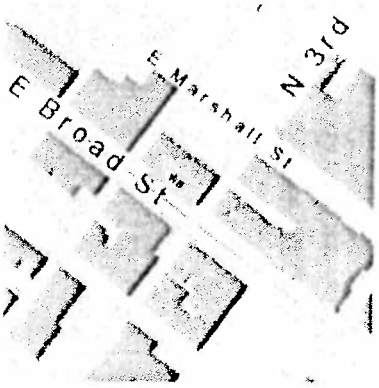

## 3rd/4th STREET - WEST

**Location:**
Station located on the north side of E. Broad Streets, just west of 3rd Street.

**Adjacent Property Descriptions:**
The station is adjacent to property owned by VCU (that will house their police department) and Ann's Soul Food restaurant.

Meetings were held with VCU and Ann's Soul Food Restaurant, both who expressed support for the project.

The sidewalk at this station is wide enough to permit pedestrians to walk behind the station.

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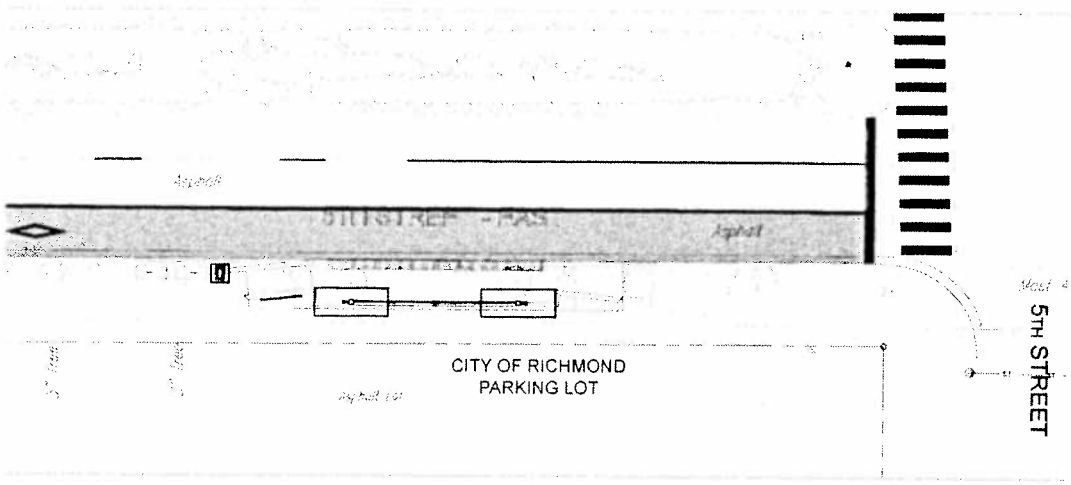
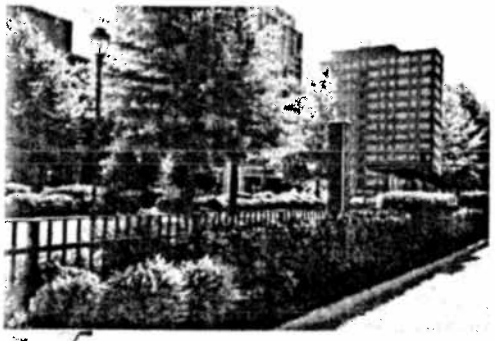


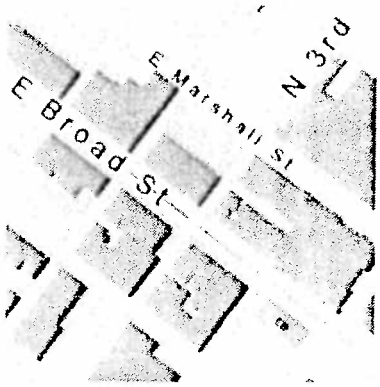

## 3rd/4th STREET - EAST

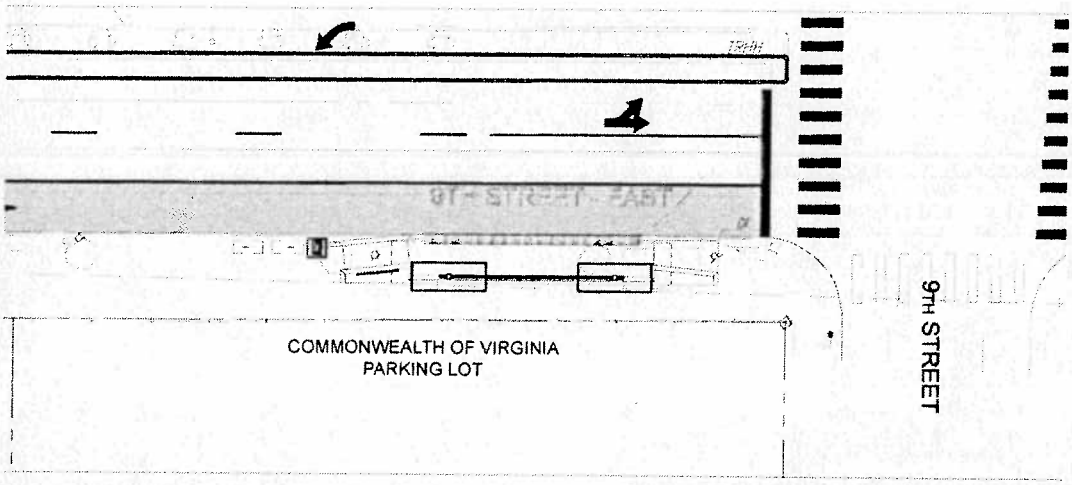
**Location:**
Station located on the south side of E. Broad Street, between 4th and 5th Streets.

**Adjacent Property Descriptions:**
The station is located adjacent to a parking lot owned by the City of Richmond.

The sidewalk at this station is wide enough to permit pedestrians to walk behind the station.





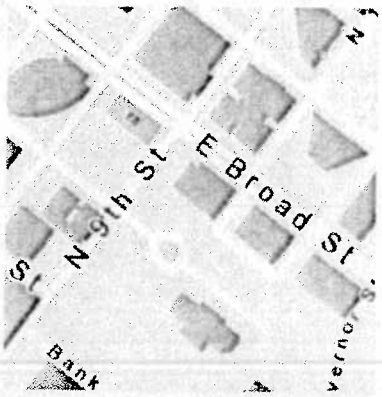


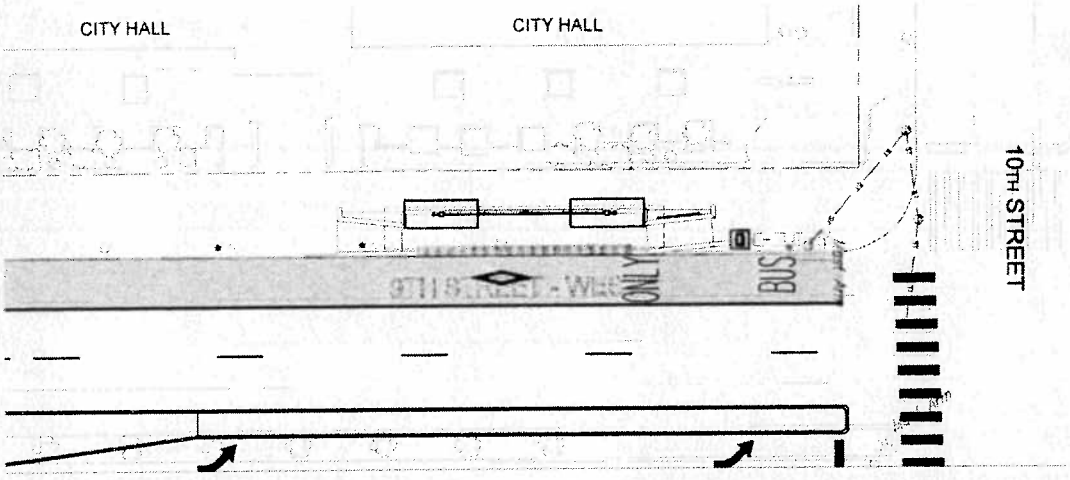

## 9th STREET - EAST

**Location:**
Station located on the south side of E. Broad Street, just west of 9th Street.

**Adjacent Property Descriptions:**
The station is located in front of a parking lot owned by the Commonwealth of Virginia.

The sidewalk at this station is wide enough to permit pedestrians to walk behind the station.



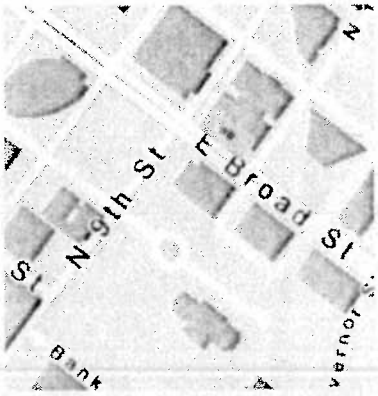


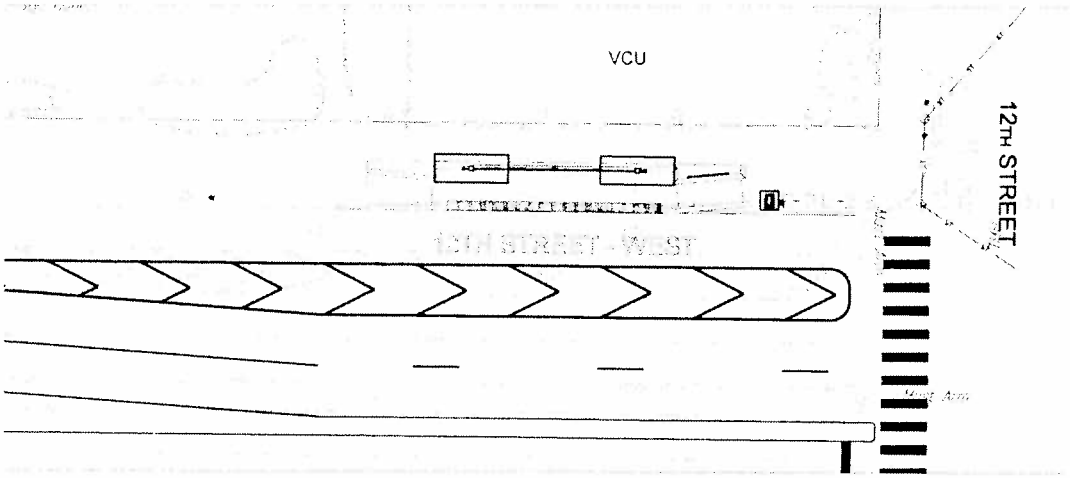

## 9th STREET - WEST

**Location:**
Station located on the north side of E. Broad Street, just west of 10th Street.

**Adjacent Property Descriptions:**
The station is located in front of City Hall.

The sidewalk at this station is wide enough to permit pedestrians to walk behind the station.



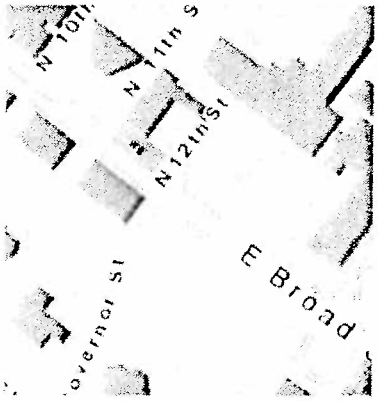


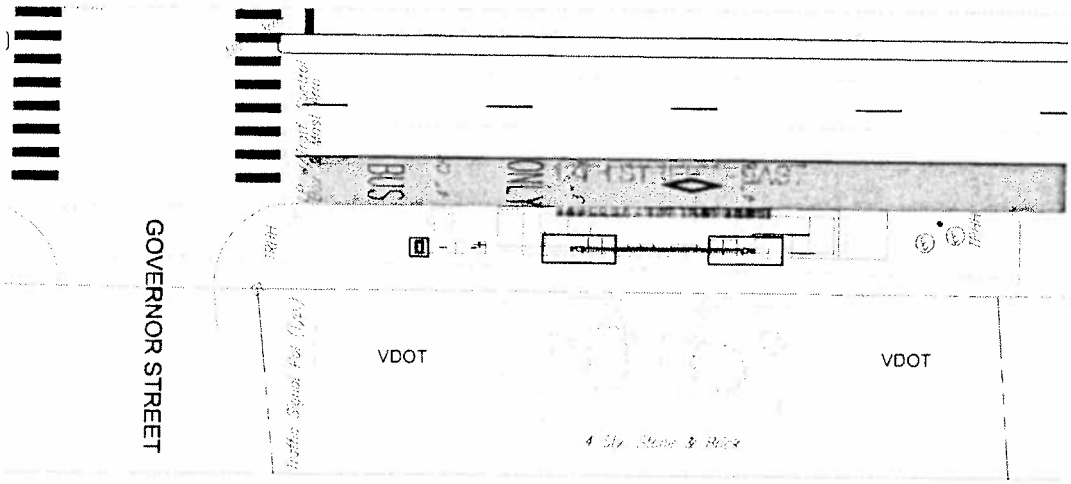

## 12th STREET - WEST

**Location:**
Station located on the north side of E. Broad Street, just west of 12th Street.

**Adjacent Property Descriptions:**
The station is located in front of academic buildings owned by Virginia Commonwealth University. VCU has been contacted and is in support of the project and station location.

The sidewalk at this station is wide enough to permit pedestrians to walk behind the station.



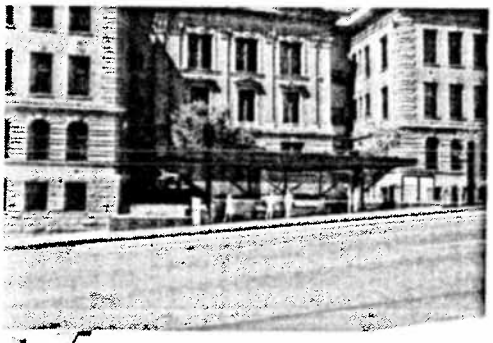


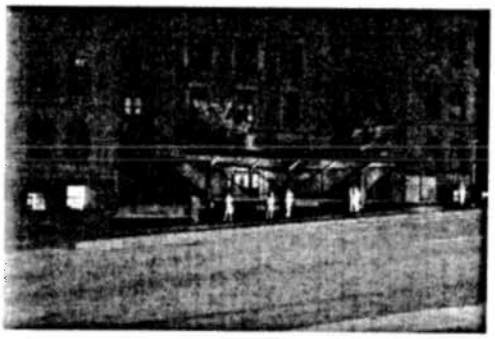

## 12th STREET - EAST

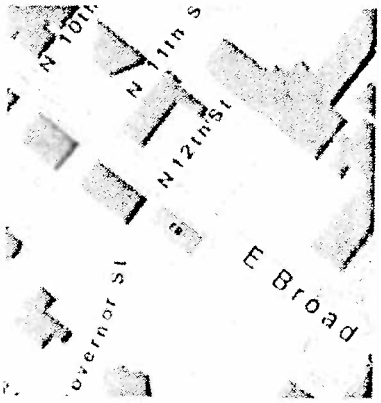
**Location:**
Station located on the south side of E. Broad Street, just east of Governor Street.

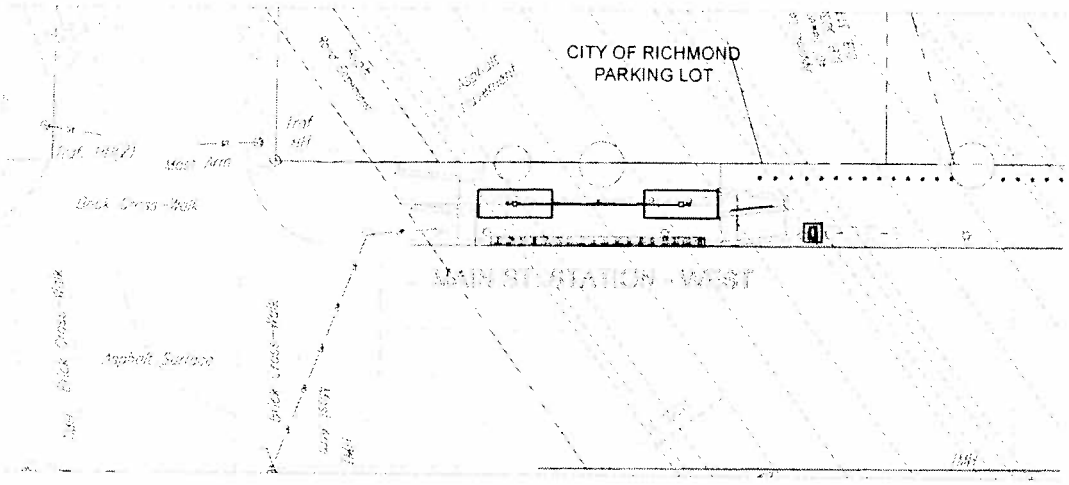
**Adjacent Property Descriptions:**
The station is located in front of a building occupied by the Virginia Department of Transportation. VDOT has been contacted and is in support of the project and station location.

The sidewalk at this station is wide enough to permit pedestrians to walk behind the station.







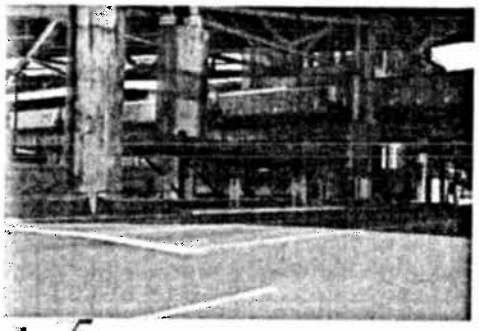


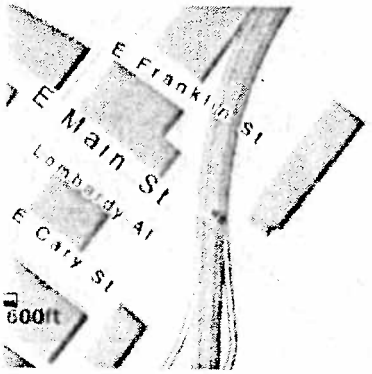

## MAIN STREET STATION - WEST

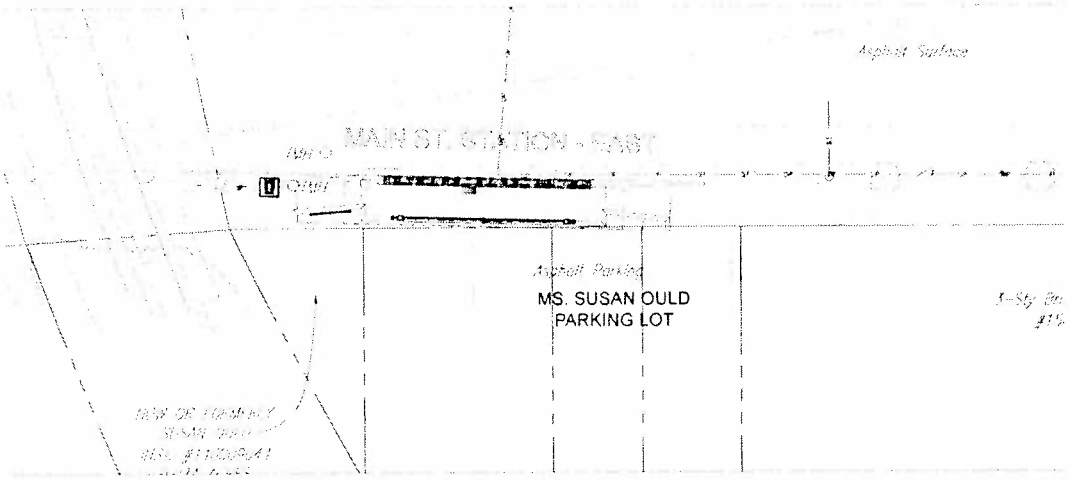
**Location:**
Station located on the north side of Main Street, just east of 15th Street.

**Adjacent Property Descriptions:**
The station is located adjacent to a parking lot owned by the City of Richmond.

The sidewalk at this station is wide enough to permit pedestrians to walk behind the station.





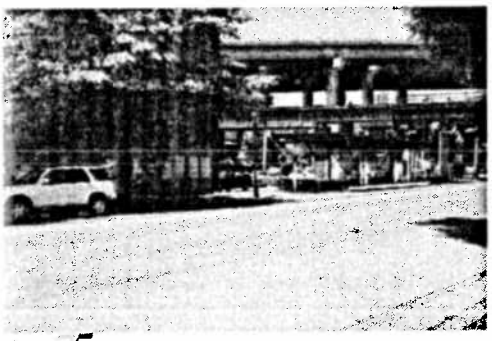


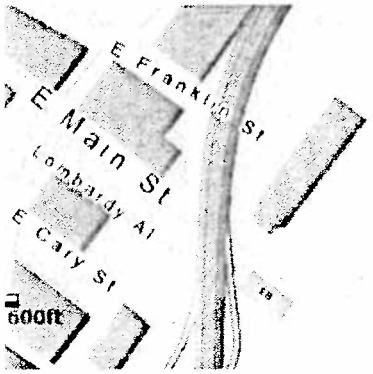

## MAIN STREET STATION - EAST

**Location:**
Station located on the south side of Main Street, just beyond the train trellis.

**Adjacent Property Descriptions:**
The station is located adjacent to a parking lot for an apartment building owned by Ms. Susan Ould. The design team met with Ms. Ould to discuss the station location and Ms. Ould has indicated her support for the project and the station location.

The station will occupy the entire width of the sidewalk and pedestrians will walk through the station.



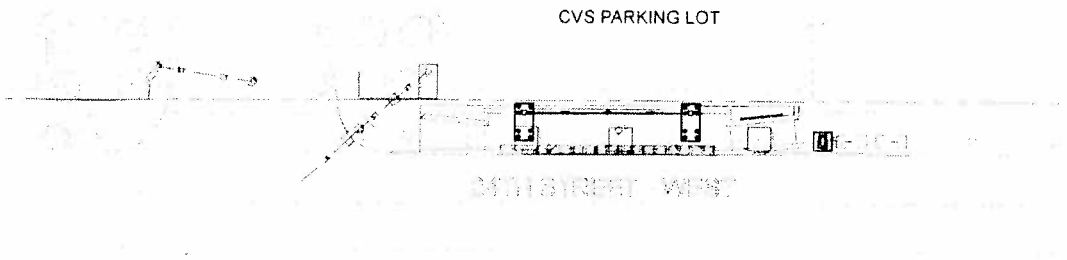


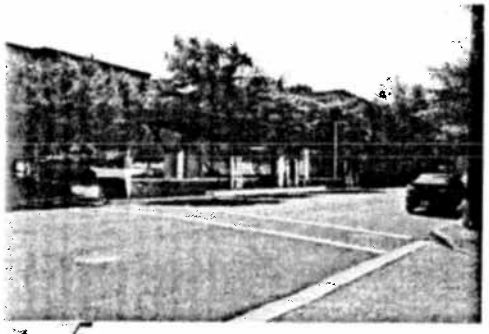
## 24th STREET - WEST

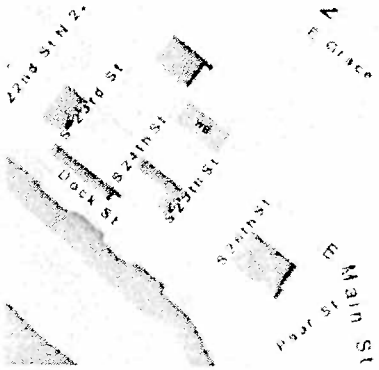
**Location:**
Station located on the north side of Main Street, just east of 24th Street.

**Adjacent Property Descriptions:**
The station is located adjacent to a parking lot that serves a Farm Fresh grocery store and a CVS drugstore. The design team met with the managers of the Farm Fresh Store and the CVS stores and they are supportive of the project and the station location.

The station will occupy the entire width of the sidewalk and pedestrians will walk through the station.





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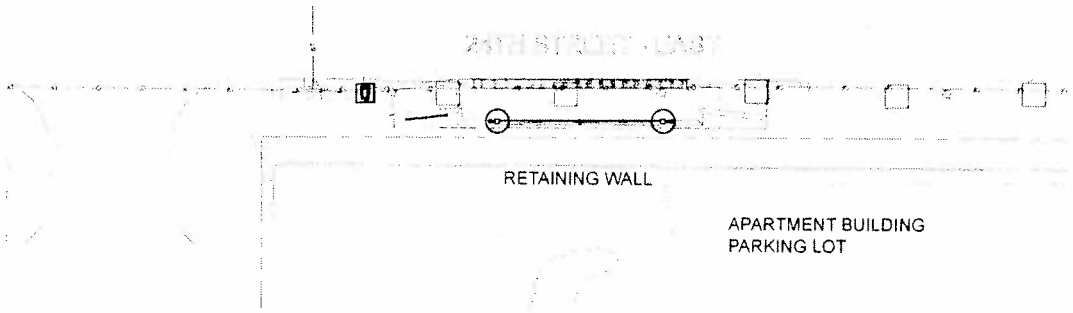
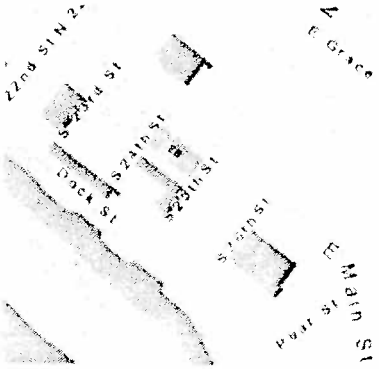


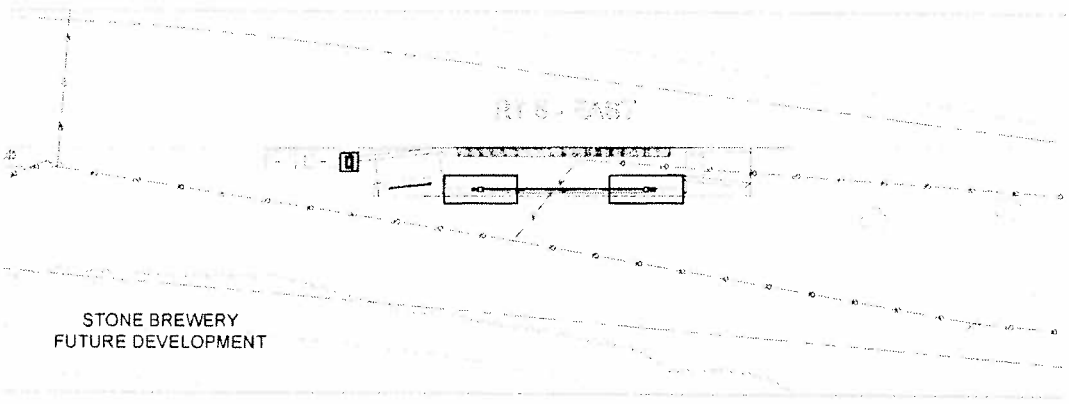

## 24th STREET - EAST

**Location:**
Station located on the south side of Main Street, just east of 24th Street.

**Adjacent Property Descriptions:**
The station is located adjacent to a retaining wall for a lower level parking lot for an apartment building. The owner of the apartment building was contacted but did not request a meeting.

The station will occupy the entire width of the sidewalk and pedestrians will walk through the station.



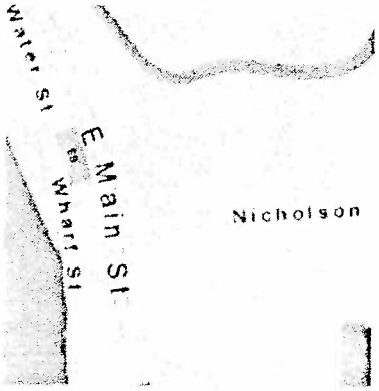


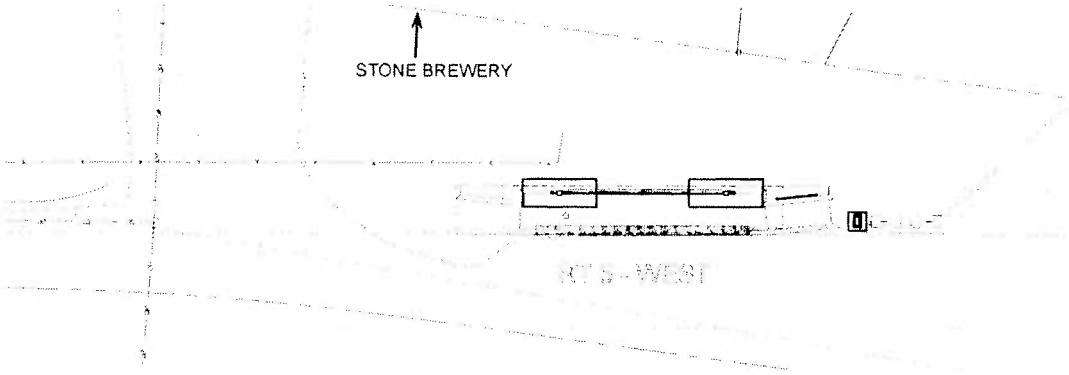

## ROUTE 5 - EAST

**Location:**
Station located on the south side of Route 5, at the site of the new Stone Brewery that currently is under construction.

**Adjacent Property Descriptions:**
The station is located adjacent to a grassy parcel owned by Stone Brewery. Stone Brewery requested a station at this location. The design team has met with Stone Brewery and the City of Richmond to coordinate plans for the station with the development plans for Stone Brewery and the improvement plans for Route 5 under development by the City of Richmond.

The station will occupy the entire width of the sidewalk and pedestrians will walk through the station.



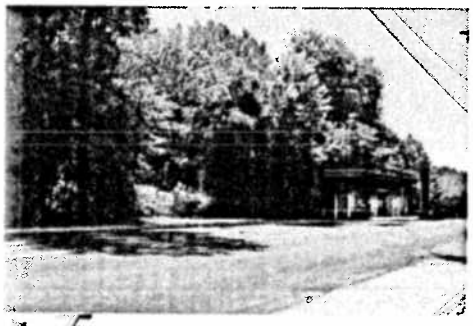


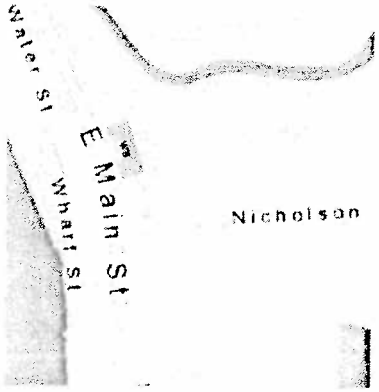

## ROUTE 5 - WEST

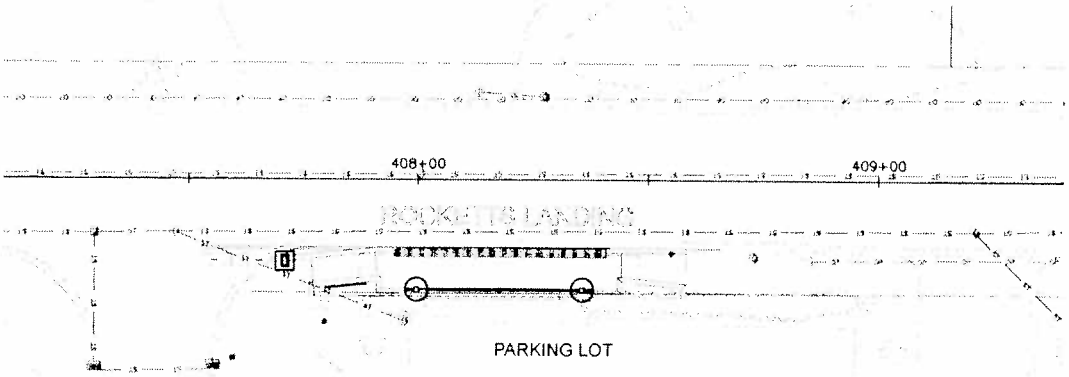
**Location:**
Station located on the north side of Route 5, at the site of the new Stone Brewery that currently is under construction.

**Adjacent Property Descriptions:**
The station is located adjacent to undeveloped property owned by Stone Brewery. Stone Brewery requested a station at this location. The design team has met with Stone Brewery and the City of Richmond to coordinate plans for the station with the development plans for Stone Brewery and the improvement plans for Route 5 under development by the City of Richmond.

The station will occupy the entire width of the sidewalk and pedestrians will walk through the station.





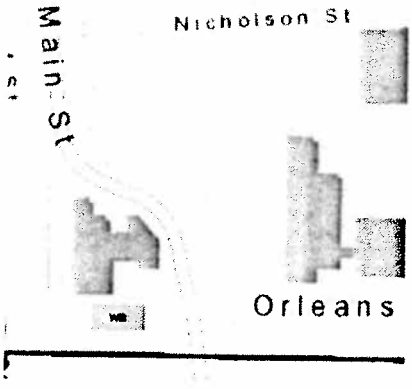



## ROCKETT'S LANDING

**Location:**
The station is located on the south side of Orleans Street, just east of the intersection with Old Main Street.

**Adjacent Property Descriptions:**
The station is located adjacent to a large parking lot that serves the Rockett's Landing Complex. The design team met with a representative of WVS Companies, owner of the property to discuss the location of the station. WVS Companies is supportive of the project and the station location.

The station will occupy the entire width of the sidewalk and pedestrians will walk through the station.



October 2, 2015

City of Richmond
Urban Design Committee
900 East Broad Street
Room 510
Richmond, VA 23219

**RE: Response to UDC/Planning Commission Comments from September 9, 2015 PC Meeting Minutes**

**UDC/PC Comment #8:** ***That the final plans include a tree survey, showing the location, size and species of all trees that will be removed along the project corridor as a result of this project.***

**Applicant Response:** As the design team prepares the technical requirement documents, a tree survey will be completed that shows the location, size and species of all trees that will be removed along the project corridor as a result of this project. Towards that end the design team has set up a meeting with Mr. Luke McCall, City Arborist for October 14, 2015 to discuss this and other landscape elements of the BRT project.

Depending on negotiations between the design-builder and the City, tree replacement value may need to be provided to the City. The Director of Public Works has the authority to waive this requirement.

**SUPPORTING DOCUMENTATION**

None

October 2, 2015

City of Richmond
Urban Design Committee
900 East Broad Street
Room 510
Richmond, VA 23219

**RE: Response to UDC/Planning Commission Comments from September 9, 2015 PC Meeting Minutes**

UDC/PC Comment #9: ***That the City Department of Public Works Urban Forestry Division coordinates with GRTC to provide deciduous, shade-producing street trees in areas adjacent to those where existing trees will be removed, or, if space is not available in the vicinity, in other areas along the BRT corridor.***

Applicant Response: As the design team prepares the technical requirement documents, we will coordinate with the City Department of Public Works Urban Forestry Division to specify deciduous, shade-producing street trees in areas adjacent to those where existing trees will be removed, or, if space is not available in the vicinity, in other areas along the BRT corridor. Towards that end the design team has set up a meeting with Mr. Luke McCall, City Arborist for October 14, 2015 to discuss this and other landscape elements of the BRT project.

The design builder for this project will have the responsibility to provide replacement value in accordance with the tree size/caliper replacement policy and all other Urban Forestry regulations. The design-builder will also coordinate with the City of Richmond for the provision and installation of trees for the BRT project.

## SUPPORTING DOCUMENTATION

None

October 2, 2015

City of Richmond
Urban Design Committee
900 East Broad Street
Room 510
Richmond, VA 23219

**RE: Response to UDC/Planning Commission Comments from September 9, 2015 PC Meeting Minutes**

UDC/PC Comment #10: ***That the final plans include a signage package, to include signs placed upon or adjacent to the roadway as well as station identifying signage. This package should include materials, finishes and dimensions of the signs.***

**Applicant Response:** The technical requirements documents that are being prepared by the design team will include a signage package. All roadways signs will be designed according to MUTCD guidelines. Signage for the stations will be as set out in the revised 30% drawings and technical requirement documents and will be in accordance with the City of Richmond wayfinding signage program.

## SUPPORTING DOCUMENTATION

None

October 2, 2015

City of Richmond
Urban Design Committee
900 East Broad Street
Room 510
Richmond, VA 23219

**RE: Response to UDC/Planning Commission Comments from September 9, 2015 PC Meeting Minutes**

UDC/PC Comment #11: ***That the final plans include a lighting plan for the stations, to include make, model and finish of any light fixture; light source and light color temperature. LED lights with a color temperature of 3000k are recommended. The lighting plan should also include a representative photometric diagram for at least one of the stations.***

**Applicant Response:** The technical requirements documents that are being prepared by the design team will include a representative photometric diagram for at least one station and will instruct that LED lights with a color temperature of 3000K are to be used at the stations.

## SUPPORTING DOCUMENTATION

None

Kimley»Horn

October 15, 2015

**To: Urban Design Committee, City of Richmond**

**RE: *Consolidated Stops for GRTC Bus Rapid Transit Project***

**UDC/PC Comment 12 and 20:**

- That the BRT planning team provide a plan showing how the existing bus stops along the BRT route will be impacted and how they connect into the BRT stations
- That the BRT planning team investigate providing better connectivity and service to communities in the east end

**Applicant Response:** Consolidated stops along the GRTC BRT Project route are essential to the integration and connectivity of the BRT to the existing local bus routes. Four consolidated stops are a minimum requirement of the project's TIGER Grant. A consolidated stop at Willow Lawn Drive will encourage BRT and local bus ridership along the entire corridor and provide transit riders with opportunities to utilize local service connections to Park and Ride facilities in the West End / Henrico County. Consolidated stops at 9th Street and 12th Street will support the high demand of local ridership on many major GRTC local bus routes providing service to and from Downtown. In particular, connections to Routes 41 and 51 at 12th Street will provide access to and from Church Hill in the East End. A consolidated stop at 24th Street will provide eastbound and westbound BRT connectivity to local bus Routes 52 and 53, which serve the Fulton and Montrose Heights neighborhoods also in the City's East End.

The City of Richmond and GRTC will conduct a Comprehensive Operations Analysis (COA) that will evaluate the entire GRTC system. The COA will provide system-wide recommendations that will more fully address the questions and concerns regarding local route connectivity to the BRT system.

## SUPPORTING DOCUMENTATION

Route 6 currently has the highest ridership of GRTC local bus routes. This route runs along Broad Street with service from Willow Lawn Drive to 14th Street. Understanding the connections from Route 6 to other existing GRTC local bus routes and the surrounding areas is vital for a successful integration of the GRTC BRT Project with local bus service. Routes 18 and 19 operate along Broad Street connecting Willow Lawn to the West End. Routes 52 and 53 run along Main Street, providing access between Downtown and Fulton and Montrose Heights. Routes 41 and 51 connect along Broad Street and run between Downtown and Church Hill.

A local bus stop and BRT station are considered consolidated when the two facilities are located on the same block or around the corner from each other, and little or no street crossings are required. The proximity and ease of access between the local bus stop and the BRT station serves as a successful tie-in to increase operational efficiency and strong connections to the proposed BRT. Theoretically, a rider can get off a local bus and easily access a BRT bus, or vice versa. At least four

consolidated stops are required along the BRT corridor per the project's Federal Transit Administration (FTA) awarded TIGER Grant.

When possible, a GRTC local bus stop should be located downstream of the proposed BRT station for the consolidated stop. The BRT buses will have an easier time achieving precision docking of both the front and rear doors at the stations, as opposed to having to maneuver around stopped local buses and then maneuver back to the curb for precision docking. Additionally, consolidated stops in the curb-running and mixed flow sections of the BRT corridor are desired in order to avoid elimination of additional parking. The locations for the four proposed consolidated stops include Willow Lawn Drive, 9th Street, 12th Street, and 24th Street.

### Consolidated Stop at Willow Lawn Drive

The proposed BRT station is located on Broad Street at Willow Lawn Drive, and marks the Western Terminus of the GRTC BRT corridor. A consolidated stop at this location encourages increased use of the BRT along the length of the entire corridor. The GRTC local bus stops at Willow Lawn Drive will provide access to Routes 6, 18, 19, and 91. Route 18 provides access to the West End, giving riders the potential option to utilize the Park and Ride facilities at Glenside. A slight modification to Route 19 would allow for an additional Park and Ride connection to Gaskins. A consolidated stop at Willow Lawn Drive will encourage increased ridership of both the GRTC local buses and the BRT by providing a strong connection to the West End. The consolidated stop at Willow Lawn Drive is shown in Figure 1.

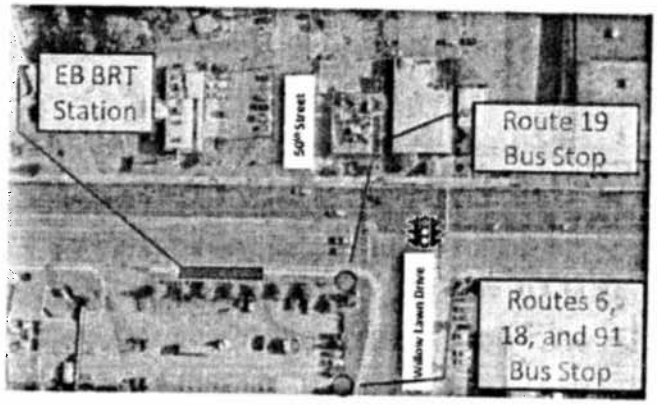



Figure 1. The location of the proposed BRT station and two existing local stops at Willow Lawn Drive.

### Consolidated Stop at 9th Street

Eastbound and westbound BRT stations are proposed along Broad Street at 9th Street. A consolidated stop at 9th Street supports the high demand of local ridership of Route 6, and many other major GRTC local bus routes. In particular, Routes 62, 63, 70, 71, 72, and 73 only cross Broad Street at 9th Street and have few convenient opportunities to transfer. Therefore, 9th Street is an appropriate location for a consolidated stop in order to accommodate transfers from multiple local bus routes to the BRT. Additionally, 9th Street is a central location to many Downtown destinations and attractions including the Library of Virginia, City Hall, John Marshall Courts Building, Virginia Capital, General Assembly Building, and Children's Hospital of Richmond. The consolidated stop at 9th Street is shown in Figure 2.

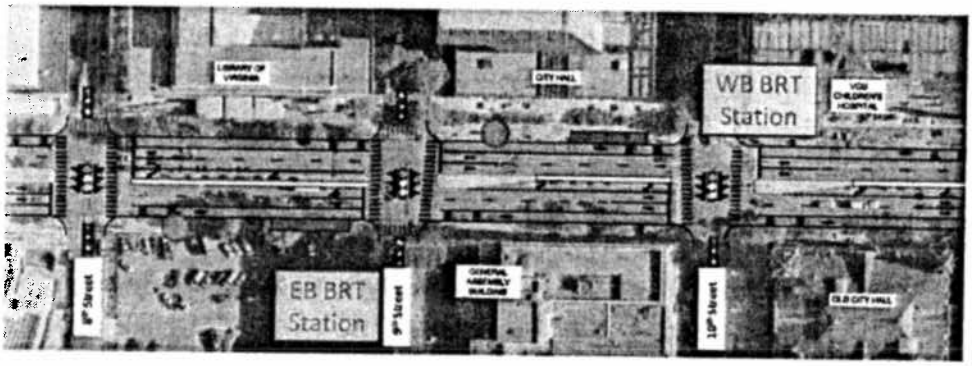



Figure 2. The location of the proposed BRT stations at 9th Street, an existing bus stop, and two proposed bus stops.

### Consolidated Stop at 12th Street

Eastbound and westbound BRT stations are proposed along Broad Street at 12th Street. A consolidated stop at 12th Street supports the high demand of local ridership of Route 6, and many other major GRTC local bus routes. In particular, Routes 41 and 51 provide service to Church Hill in the East End. Major employment centers are located near 12th Street including VCU Health System, Commonwealth of Virginia offices, and Virginia Department of Transportation. The consolidated stop at 12th Street is shown in Figure 3.

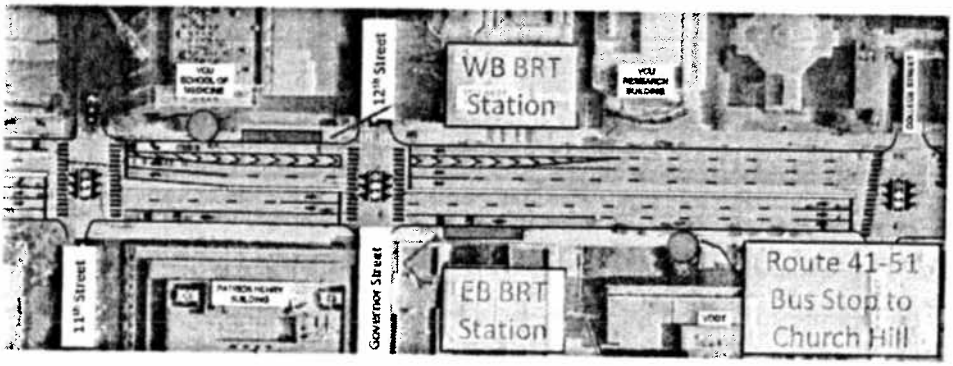



Figure 3. The location of the proposed BRT stations a 12th Street, and existing local bus stops with access to and from Church Hill.

### Consolidated Stop at 24th Street

The proposed consolidated stop at 24th Street provides eastbound and westbound BRT connectivity to GRTC local bus Routes 52 and 53. Routes 52 and 53 travel along Main Street and provide access to and from the Fulton and Montrose Heights neighborhoods. The westbound direction involves an existing GRTC local bus stop. The eastbound direction involves relocating an existing GRTC local bus stop to the same block as the proposed BRT station, reducing pedestrian travel time and increasing pedestrian safety as there is no intersection to cross.

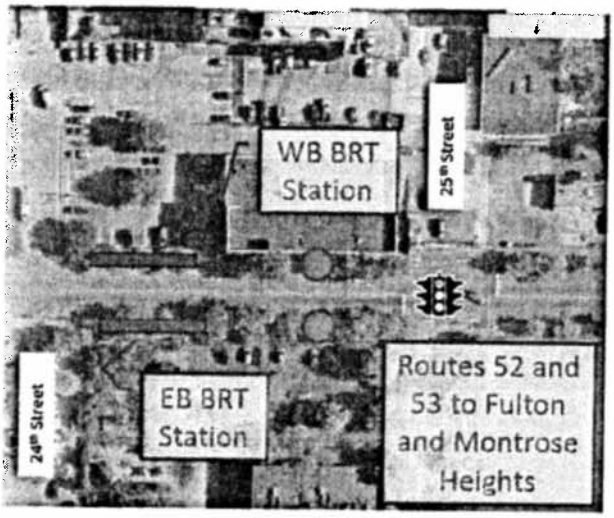



Figure 4. The location of the proposed BRT stations and local bus stops at 24th Street, with access to and from Fulton and Montrose Heights.

In addition to recommendations on consolidated stops, Nelson-Nygaard is working closely with GRTC as part of the GRTC BRT Technical Services study funded by the Mayor's Commission on Poverty. The goal of the study is to provide recommendations for modifications to existing local bus stops as well as recommendations for slight route modifications considering existing local bus routes including major routes running along portions of the BRT corridor. The study is looking at, based on Title VI of the Civil Rights Act guidance, what existing Broad Street-running local bus routes could be either reduced or eliminated, or re-routed to other areas for service. Each route modification goes through the Title VI process. A Draft Report summarizing recommendations has been prepared showing a plan for local bus stop relocation, elimination, or consolidation. The Technical Services study will evaluate local route revisions that would make connections to Fulton and Church Hill possible from the Rocketts Landing Station and 24th Street Station, respectively. The study recommendations will be presented to the community at upcoming BRT Public Meetings. The Technical Services Report will be released to the public on the week of October 25th, 2015.

Additionally the City of Richmond and GRTC will conduct a Comprehensive Operations Analysis (COA) that will evaluate the entire GRTC system. The COA will provide system-wide recommendations that will more fully address the questions and concerns regarding local route connectivity to the BRT system.

October 2, 2015

City of Richmond
Urban Design Committee
900 East Broad Street
Room 510
Richmond, VA 23219

**RE: Response to UDC/Planning Commission Comments from September 9, 2015 PC Meeting Minutes**

**UDC/PC Comment #13:** ***That the plant palette is adjusted to include more drought tolerant and native species.***

**Applicant Response:** As the design team prepares the technical requirement documents, we will coordinate with the City Department of Public Works Urban Forestry Division to ensure that appropriate drought tolerant and native species are included in the plant palette. Towards that end the design team has set up a meeting with Mr. Luke McCall, City Arborist for October 14, 2015 to discuss this and other landscape elements of the BRT project.

## SUPPORTING DOCUMENTATION

City of Richmond Approved Species Planting List

2012

# City of Richmond Approved Species Planting List

**NOTE: Not all species are permitted at any given plant site - City arborists must approve for each site**

| | Common Name | Latin Name |
|---|---|---|
| 1 | Trident maple | Acer buergeranum |
| 2 | Hedge Maple | Acer campestre |
| 3 | Amur Maple | Acer ginnala |
| 4 | Paperbark Maple | Acer griseum |
| 5 | Japanese Maple | Acer palmatum |
| 6 | Norway maple | Acer platanoides 'Columnare', 'Crimson Sentry', 'Easy Street', 'Olmstead' |
| 7 | Globe Norway maple | Acer platanoides 'Globosum' |
| 8 | Red maple | Acer rubrum 'Armstrong', 'Bowhall' |
| 9 | Sugar maple | Acer saccharum 'Apollo', 'Newton Sentry |
| 10 | Horsechestnut | Aesculus hippocastanum |
| 11 | Alder | Alnus glutinosa |
| 12 | Shadblow Serviceberry | Amelanchier canadensis |
| 13 | River birch | Betula nigra |
| 14 | European Hornbeam | Carpinus betulus |
| 15 | American Hornbeam | Carpinus caroliniana |
| 16 | Pignut Hickory | Carya glabra |
| 17 | Mockernut Hickory | Carya tomentosa |
| 18 | Catalpa | Catalpa speciosa |
| 19 | Hackberry | Celtis occidentalis |
| 20 | Katsuratree | Cercidiplyllum japonicum |
| 21 | Eastern Redbud | Cercis canadensis |
| 22 | White redbud | Cercis canadensis 'Texas White' |
| 23 | Chinese fringetree | Chionanthus retusus |
| 24 | White Fringetree | Chionanthus virginicus |
| 25 | American Yellowwood | Cladrastis lutea |
| 26 | Pagoda dogwood | Cornus alternifolia |
| 27 | Flowering Dogwood | Cornus florida |
| 28 | Japanese Dogwood | Cornus kousa |
| 29 | Cornelian cherry | Cornus mas 'Spring Glow' |
| 30 | Stellar dogwood | Cornus x rutgerinensis |
| 31 | American Smoketree | Cotinus obovata |
| 32 | Cryptomeria | Cryptomeria japonica |
| 33 | American Beech | Fagus sp. |
| 34 | European Beech | Fagus sp. |
| 35 | Ginkgo | Ginkgo biloba |
| 36 | Ginkgo (columnar) | Ginkgo biloba 'Fairmount','Fastigiata', 'Princeton Sentry' |
| 37 | Honey Locust (fruitless) | Gleditsia triacanthos inermis |
| 38 | Kentucky Coffee Tree | Gymnocladus dioicus |
| 39 | Carolina Silverbell | Halesia carolina |

| | | |
|---|---|---|
| 40 | Witch Hazel | Hamemelis sp. |
| 41 | Cratageus sp. | Hawthorne species |
| 42 | American Holly | Ilex opaca |
| 43 | Nellie Stevens Holly | Ilex x 'Nellie R. Stevens' |
| 44 | Foster Holly | Ilex x atteneuata 'fosteri' |
| 45 | Red Cedar | Juniperus virginiana |
| 46 | Goldenraintree | Koelreuteria paniculata |
| 47 | Crapemyrtle | Lagerstroemia indica |
| 48 | Fruitless Sweetgum | Liquidambar styraciflua "Rotundiloba" |
| 49 | Yellow-poplar | Liriodendron tulipifera |
| 50 | Cucumber Tree | Magnolia acuminata |
| 51 | Southern magnolia* | Magnolia grandiflora 'Alta', 'Hasse' |
| 52 | Little Gem magnolia* | Magnolia grandiflora 'Little Gem' |
| 53 | Star magnolia | Magnolia stellata |
| 54 | Sweetbay Magnolia | Magnolia virginiana |
| 55 | Galaxy magnolia | Magnolia x 'Galaxy' |
| 56 | Saucer magnolia | Magnolia x soulangiana |
| 57 | Flowering crabapple | Malus spp. |
| 58 | Dawn Redwood | Metasequoia glyptostroboides |
| 59 | Black Gum | Nyssa sylvatica |
| 60 | American Hophornbeam | Ostrya virginiana |
| 61 | Sourwood | Oxydendrum arboreum |
| 62 | Persian Parrotia | Parrotia persica |
| 63 | Austrian Pine | Pinus nigra |
| 64 | Scots Pine | Pinus sylvestris |
| 65 | Loblolly Pine | Pinus taeda |
| 66 | Chinese Pistache | Pistacia chinensis |
| 67 | London Planetree | Platanus acerifolia |
| 68 | American Sycamore | Platanus occidentalis |
| 69 | Carolina Cherry Laurel | Prunus caroliniana |
| 70 | Pissard Plum | Prunus cerasifera |
| 71 | Cherry plum | Prunus cerasifera 'Thundercloud' |
| 72 | Black Cherry | Prunus serotina |
| 73 | Kwanzan Cherry | Prunus serrulata |
| 74 | Yoshino Cherry | Prunus yedoensis |
| 75 | Aristocrat Pear | Pyrus calleryana 'aristocrat' |
| 76 | Sawtooth oak | Quercus acutissima |
| 77 | White Oak | Quercus alba |
| 78 | Swamp White Oak | Quercus bicolor |
| 79 | Scarlet Oak | Quercus coccinea |
| 80 | Southern Red Oak | Quercus falcata |
| 81 | Swamp Chestnut Oak | Quercus michauxii |
| 82 | Water Oak | Quercus nigra |
| 83 | Nuttall Oak | Quercus nuttallii |

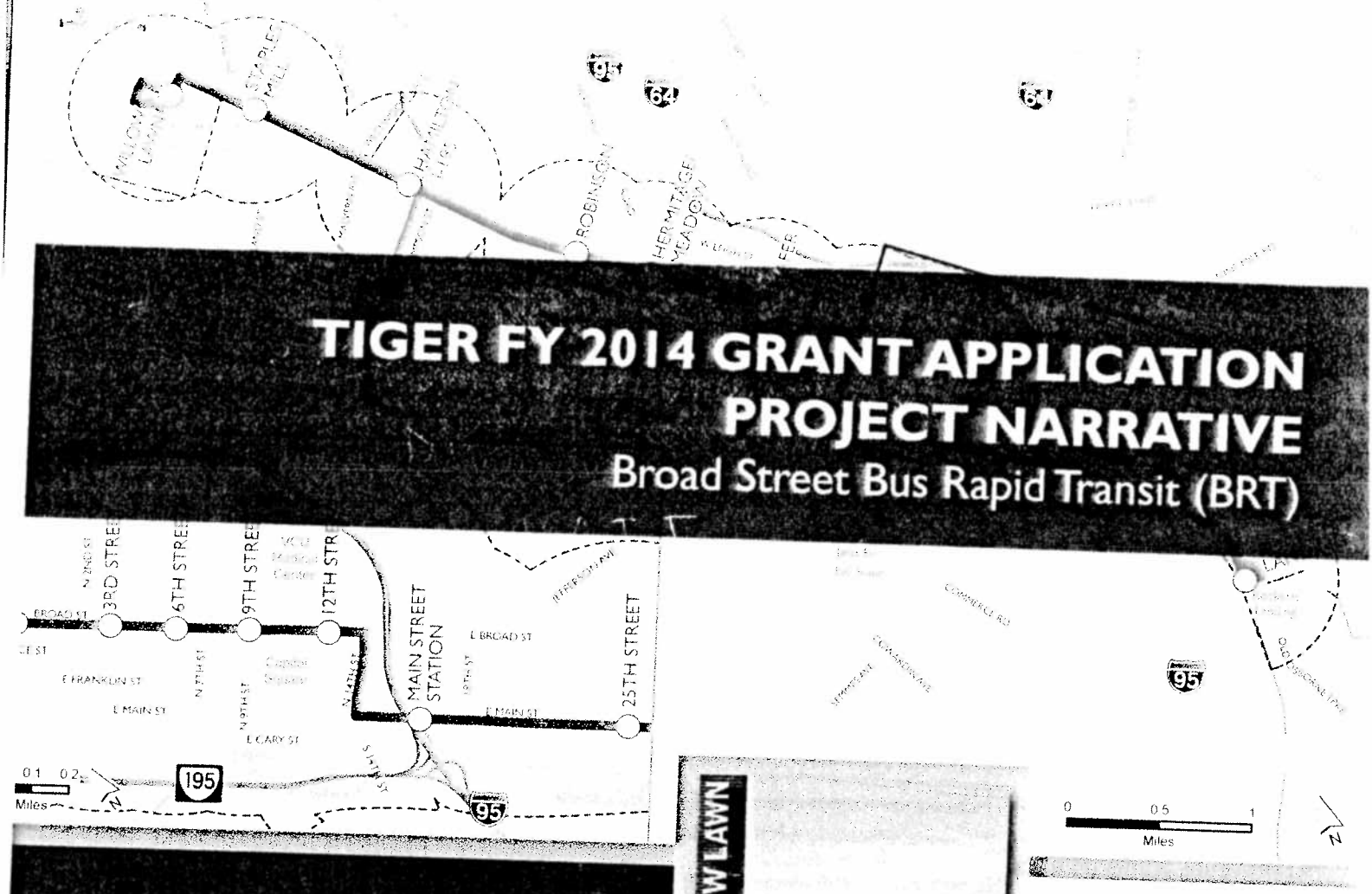
| | | |
|---|---|---|
| 84 | Pin Oak | Quercus palustrus |
| 85 | Willow Oak | Quercus phellos |
| 86 | English oak | Quercus robur 'Fastigiata','Skyrocket' |
| 87 | Post Oak | Quercus stellata |
| 88 | Live Oak | Quercus virginiana |
| 89 | Sassasfras | Sassafras albidum |
| 90 | Japanese Pagodatree | Sophora japonica |
| 91 | Japanese stewartia | Stewartia pseudocamellia |
| 92 | Stewartia | Stewartia rostrata |
| 93 | American snowbell | Styrax americanus |
| 94 | Japanese snowbell | Styrax japonicus (esp. 'Pink Chimes') |
| 95 | Fragrant snowbell | Styrax obassia |
| 96 | Japanese tree lilac | Syringa reticulata |
| 97 | Baldcypress | Taxodium distichum |
| 98 | American Linden | Tilia americana |
| 99 | Littleleaf Linden | Tilia cordata |
| 100 | Arborvitae | Thuja occidentalis |
| 101 | Silver Linden | Tilia petiolaris |
| 102 | American Elm | Ulmus americana (disease resistant varieties) |
| 103 | Chinese Elm | Ulmus parvifolia |
| 104 | Zelkova | Zelkova serrata 'Village Green' |

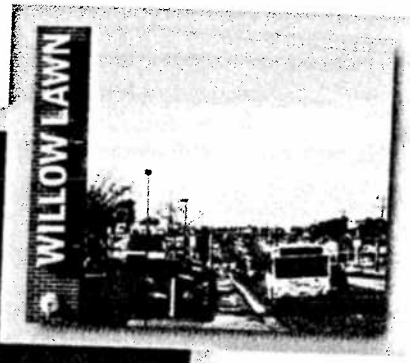
## EXHIBIT B

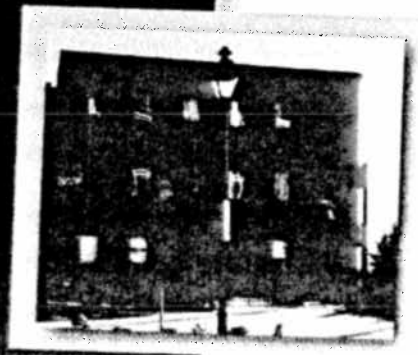
**TIGER Grant Agreement dated September 14, 2015**

Attached hereto

# TIGER FY 2014 GRANT APPLICATION
# PROJECT NARRATIVE
## Broad Street Bus Rapid Transit (BRT)

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Director of Engineering / Construction
Greater Richmond Transit Company
301 East Belt Boulevard
Richmond, VA 23224


GRTC TRANSIT SYSTEM


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Appendix A: Letters of Support
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*Supporting documentation from the Broad Street Rapid Transit Study that is referenced in this document can be found at the project website: http://study.ridegrtc.com/documents/*


## I. Project Description

The ***Broad Street Bus Rapid Transit (BRT)*** project is a regional collaboration between Greater Richmond Transit Company (GRTC), the Department of Rail and Public Transportation (DRPT), the City of Richmond, and Henrico County. Broad Street BRT will improve transit service, increase livability, enhance economic opportunity, revitalize commercial properties, improve environmental sustainability and stimulate economic development in the city, county and the greater Richmond region.

### *Project Highlights*

The Broad Street BRT will be 7.6 miles long and constructed in a busy transportation corridor which connects greater Richmond to growth areas in surrounding areas in Henrico County. As development has occurred along Broad Street historically and in recent years, the corridor has become more important as an activity center and economic engine for the region. Over 33,000 people live and over 77,000 jobs are located within a half-mile of the project stations. Importantly, Broad Street BRT will create economic opportunity in a city with the highest poverty rate in Virginia.

The project will enhance *Economic Competitiveness* by creating a fast and reliable service in an economically distressed corridor and connecting substantial transit-dependent populations with improved employment and educational opportunities, retail, and services. Broad Street BRT will:

- ***Increase*** bus service to a vital corridor serving the central business district.
- ***Create*** "ladders of opportunity" in a region that ranks 85th out of 100 in upward mobility.[1]
- ***Provide convenient and reliable*** access to jobs for transit-dependent persons in an area where nearly 27% of the population is in poverty[2] and 17% have no vehicle.[3]
- ***Improve*** access to major retail centers like Willow Lawn, particularly for transit dependent populations.

The project will enhance the *State of Good Repair* for GRTC by accelerating the replacement of its fleet with Compressed Natural Gas (CNG) vehicles. The project will have extensive *Quality of Life* impacts for low income residents, corridor workers, inter-city rail passengers, and corridor residents, many of which will benefit the greater region. Broad Street BRT will:

- ***Increase*** access to major educational institutions, multiple museums, and numerous community facilities.
- ***Add*** the first fixed guideway transit service in Richmond, one of only 13 metropolitan regions of over one million in the US without such service.
- ***Initiate*** the first step in a planned regional rapid transit network that will further improve access to jobs and opportunity.
- ***Spur*** new retail development.
- ***Add*** high-frequency, branded transit service to the multimodal hub, Amtrak station and inter-city bus stop at Main Street Station.
- ***Revitalize*** an economically distressed area by spurring reuse and redevelopment of underutilized properties.
- ***Support*** the land use vision of the Richmond Downtown Master Plan by encouraging mixed-use and transit-oriented development.

Project features that increase economic productivity and improve access also will bring *Environmental Sustainability* benefits. Broad Street BRT will:

- ***Induce*** new riders to use transit by providing a high-quality transit service that is competitive with the automobile.
- ***Connect*** people to a mixed-use, brownfield redevelopment site, Rocketts Landing, that is currently in need of transit service.
- ***Reduce*** automobile use and expand the use of Compressed Natural Gas (CNG) transit vehicles.

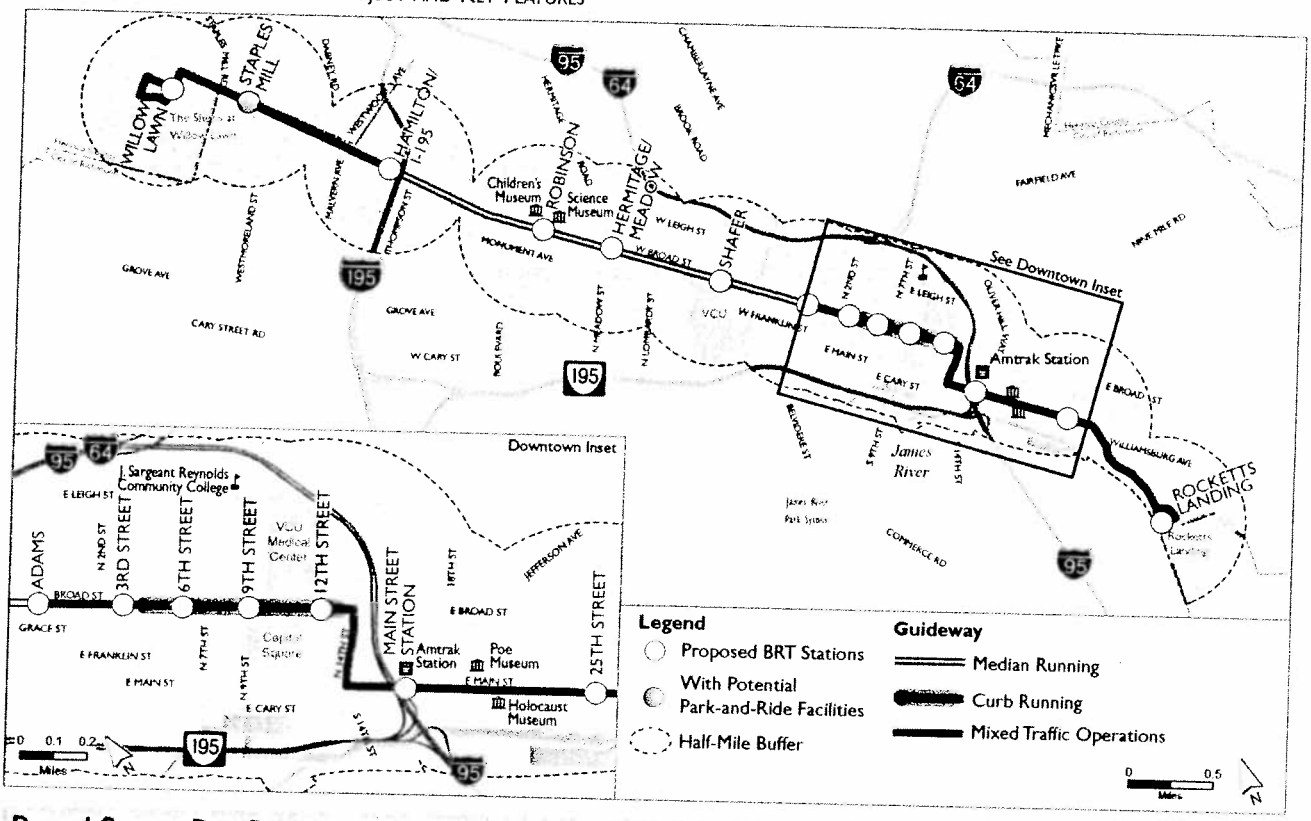
This highly efficient investment will also incorporate design features that will substantially enhance *Safety* for pedestrians, transit riders, buses, and other vehicles.

The overall benefits of Broad Street BRT outweigh the costs by a factor of 1.98. The project is also ready to proceed. FTA has determined that the project meets the criteria for a Class II documented Categorical Exclusion and preliminary engineering is funded.

FIGURE 1 shows the proposed Broad Street BRT corridor and key features of the BRT project.


*The goals of the Broad Street BRT project are improved mobility among regional and local transit users and a more efficient transit system, both of which will enhance access to jobs, revitalize an economically distressed corridor, support existing transit-oriented land use, generate new transit-oriented development (TOD), and provide an attractive alternative to the automobile for east-west travel.*

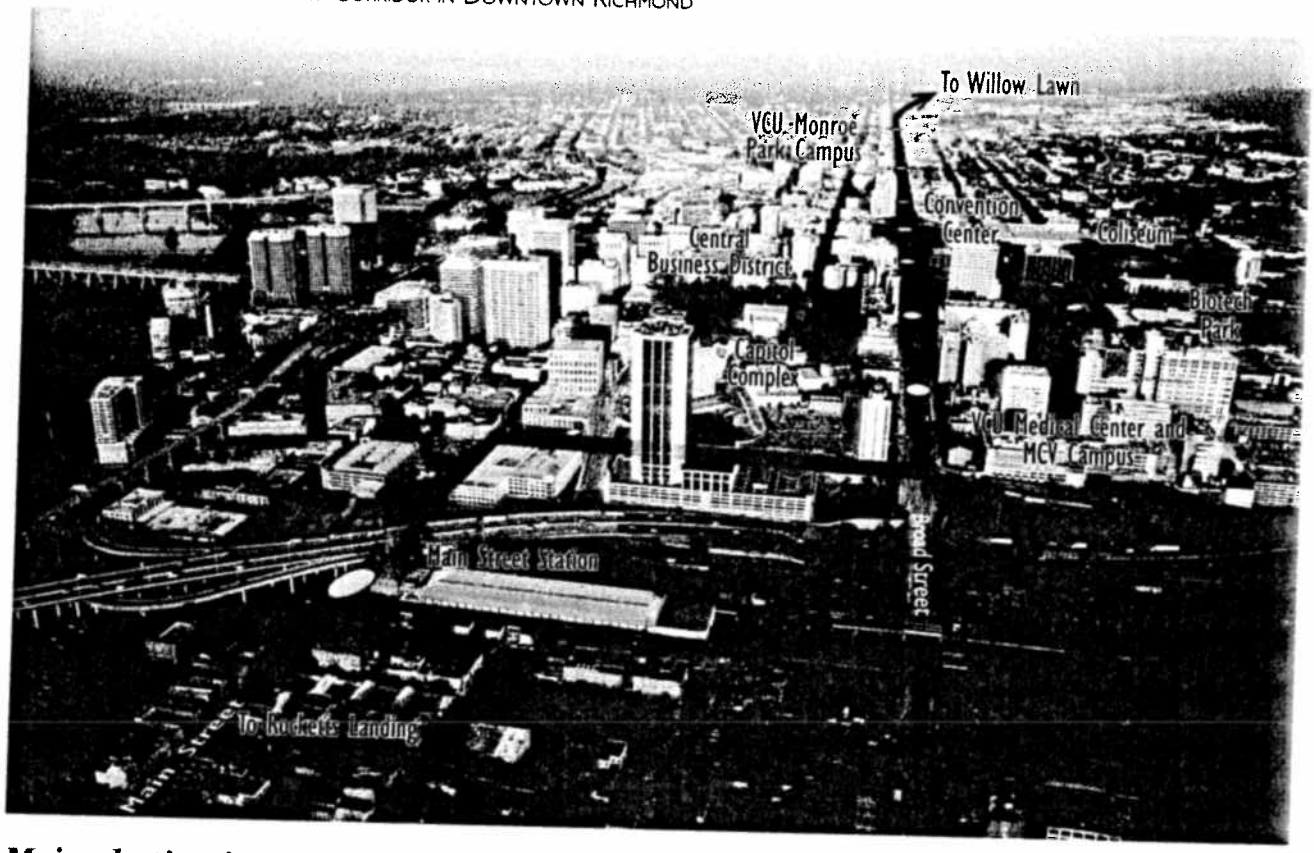
FIGURE 1: BROAD STREET BRT PROJECT AND KEY FEATURES




## Broad Street Bus Rapid Transit Key Features

| | |
|---|---|
| ROUTE LENGTH (MI) | 7.6 |
| DEDICATED BUS LANES | Thompson to Adams: median lanes<br>4th to 14th: widened shoulder lanes |
| NUMBER OF STATIONS | 14 stations (4 center,<br>4 consolidated, 6 curbside). |
| PEAK/OFF PEAK FREQUENCY (MIN.) | 10 peak / 15 off-peak |
| HOURS OF OPERATION | Weekdays: 5:30 AM-11:30 PM<br>Weekends: 6:00 AM-11:30 PM |
| TRANSFERS | Direct Transfers to<br>35 of 37 GRTC Routes |
| VEHICLES | Dedicated BRT vehicles |
| FARE COLLECTION | Off-board fare collection for BRT. |
| PROPOSED FARE | Same as local bus fare<br>(Currently $1.50) |
| DOWNTOWN FEATURES | Curb-running lane and consolidated stations for all buses on Broad Street |
| BRANDING | Stations, vehicles, guideway, signage, marketing efforts |
| INTELLIGENT TRANSPORTATION SYSTEMS | Signal priority at intersections |


FIGURE 2: BROAD STREET BRT CORRIDOR IN DOWNTOWN RICHMOND




***Major destinations served by Broad Street BRT include:***

- Rocketts Landing
- Shockoe Bottom mixed-use district
- Main Street Station (Amtrak)
- State capitol complex and major state offices
- Central Business District
- Virginia Commonwealth University (VCU) Medical Center and MCV Campus
- City Hall, City Workforce Development Center, City Dept of Social Services
- Robinson and Merhige U.S. Courthouse
- Greater Richmond Convention Center
- VCU Monroe Park Campus
- The Shops at Willow Lawn

FIGURE 2 illustrates how the project corridor travels through the central business district and will connect people to major employment centers, activity centers and multimodal destinations.

**Transportation Challenges and BRT Solutions**

Both regional and local issues drive the need for improvements to transit service in the Broad Street corridor. Locally, travel times via transit along Broad Street are long due to stopping patterns and congestion on Broad Street. GRTC Route 6 and Route 52/53 service most of the corridor and generally stop every one to two blocks, minimizing walking distance for patrons and maximizing accessibility to transit. This service pattern, however, leads to long travel times by transit. These long travel times particularly hurt transit dependent populations. The Equality of Opportunity project, conducted by Harvard University in 2013 and 2014, found that metropolitan areas with limited access to public transit, like Atlanta and Richmond, have insufficient access to employment opportunities and thus reduced opportunities to climb out of poverty.[1] *Locally, Broad Street BRT will improve access to economically distressed populations and provide a more reliable bus service to access employment, education and shopping opportunities.*


**Commuter Congestion.** Regionally, commuters can use I-95, I-64, and I-195 to access Broad Street by vehicle, but these interstates are congested at times (LOS F) [4] and regional transit generally is limited to peak hour express buses. *Broad Street BRT will provide a new alternative for regional commuters to reach jobs along the corridor.*

**Bus Bunching.** As the core of the Richmond region, downtown Richmond is a critical destination but also a choke point in the transit system. GRTC's hub-and-spoke system converges on Broad Street between 2nd and 14th Streets, causing bus congestion. Twenty- five bus routes operate along Broad Street for some portion of their alignment, and as many as 48 buses per hour operate during peak times in the central business district.[4] These factors reduce the reliability of transit service for all routes downtown, which particularly harms lower income workers who tend to have less flexible work schedules. *The consolidation of bus stops and improvements to the downtown bus lane will reduce the total end-to-end transit trip time by 14 minutes, the average transit travel time by 6 minutes, and increase service reliability for all 25 bus routes that serve portions of Broad Street downtown.*

**Transit Passenger Delays.** In 2009 there were over 16,000 boardings and alightings on an average weekday along the Broad Street corridor.[4] As seen in FIGURE 3, the pattern of boardings and alightings shows that the majority of bus stops along Broad Street handle more than 50 boardings and alightings per day. Nearly all stops along the peak hour bus lanes, between 2nd and 14th Streets, handle between 150 and 2,000 boardings and alightings per day. Heavy boarding activity is also prevalent at Willow Lawn and Staples Mill Road bus stops. The boarding and alighting patterns show strong ridership activity along the entire Broad Street corridor from downtown to the west but the volume of boardings increases dwelling time at stops. The consolidation of bus stops and improvements to these stations will reduce dwell times downtown and along the entire BRT corridor. *These improvements will reduce travel times and increase service reliability which will expand access to jobs for low-income populations served by transit.*

**Transit Travel Time.** The annual ridership of GRTC Route 6 has averaged about 1,000,000 riders since 2005, despite the long travel times and travel time variability in the corridor. A typical bus trip from downtown to Willow Lawn is approximately 30 to 40 minutes, while the same trip by car is typically 10 to 15 minutes.[3] The existing volume of transit ridership on Broad Street buses demonstrates the demand for increased and more efficient transit services in the project area. A total of 11,900 daily linked trips are projected for the Bus Rapid Transit system in the opening year, with over half (6,100) of those trips made by riders from zero-car households.[6] *The Broad Street BRT will expand capacity and efficiency for the existing transit services that are currently considered time-consuming, and thus unattractive to potential commuters.*

**Travel Time Reliability.** Currently, buses must operate in mixed traffic conditions through most of the corridor. Bus running times can vary widely depending on traffic conditions. More than 15% of AM peak period buses cannot maintain their scheduled run times, and the travel times for buses are highly variable.[3] The combination of these factors increases travel times and decreases service reliability. These effects lengthen the time riders must spend to access jobs, educational institutions, and shopping. *The BRT improvements will increase the reliability of travel times in the corridor. Combined with travel time savings, these improvements effectively expand the reach of GRTC services for transit dependent populations.*

**Development Patterns.** The Broad Street BRT would provide a permanent transit investment in an economically distressed corridor. Richmond Area Metropolitan Planning Organization's (RAMPO) forecasts show that population and jobs in the corridor will increase by 22% and 13% respectively.[7] Broad Street BRT will help add to this forecast growth and ensure that the development along the corridor is mixed use and transit-oriented, leading to a reduction in vehicles miles traveled. New development will bring new jobs, retail, and other opportunities to an economically distressed corridor and provide better access to these benefits for transit-dependent populations. *Broad Street BRT will stimulate both residential and commercial property values and make the corridor more attractive to the local and regional markets.*

**Regional Linkages.** Broad Street serves as a regional spine of activity, and while regional commuters are able to use major interstates to access Broad Street, travel conditions are expected to deteriorate in the future as noted in the RAMPO *Plan 2035*. Within one to two miles of the Broad Street corridor, there are large concentrations of commuters living in areas served by a traditional


grid of pedestrian-oriented roadways at transit-supportive densities. *This combination of proximity and pedestrian-oriented development offers an opportunity to improve local access to regional transit services through the Broad Street BRT, minimizing the reliance on automobile use within the corridor.*

**Substandard Bus Lane.** Based on data collected during field investigations, existing bus lane widths measure nine feet, which is substandard according to AASHTO Policy on Geometric Design of Highways and Streets.[7] AASHTO recommends lane widths of 10 to 12 feet for arterials based on loading area widths for buses. A Florida Department of Transportation – Transit Office report states that "the reduction of traveled lane width to 9 feet poses safety concerns to transit vehicles [since] the standard bus mirror-to-mirror width is approximately 10.5 feet."[8] The existing bus lane downtown is restricted to service during peak hours only. *Broad Street BRT will improve safety for drivers, transit users, and pedestrians by reducing vehicle weaving and improving sight distance for pedestrians.*

**Transit System Efficiency.** GRTC Route 6 experiences approximately 1,800 transfers per day, or over 25% of all system transfers on GRTC bus routes.[5] The volume of transfers on Broad Street increases dwell times and the volume of waiting passengers, which leads to a decrease in both efficiency and attractiveness. To improve transit service efficiency and reliability on Broad Street, the BRT project will redistribute existing transfer points between 3rd and 14th Streets. As planning for the implementation of the BRT proceeds, GRTC will begin a detailed route analysis review that will examine all local bus service currently operating in the corridor to improve connections between the BRT and existing local bus service, mitigate bus congestion, and maximize the use of resources. The restructuring of current local bus service may further increase the overall efficiency of the entire GRTC system. *The reduced travel and transfer times for GRTC buses create the opportunity to expand the reach of GRTC's service area, in turn expanding accessibility to jobs, retail, educational institutions and health care services for transit-dependent residents.*

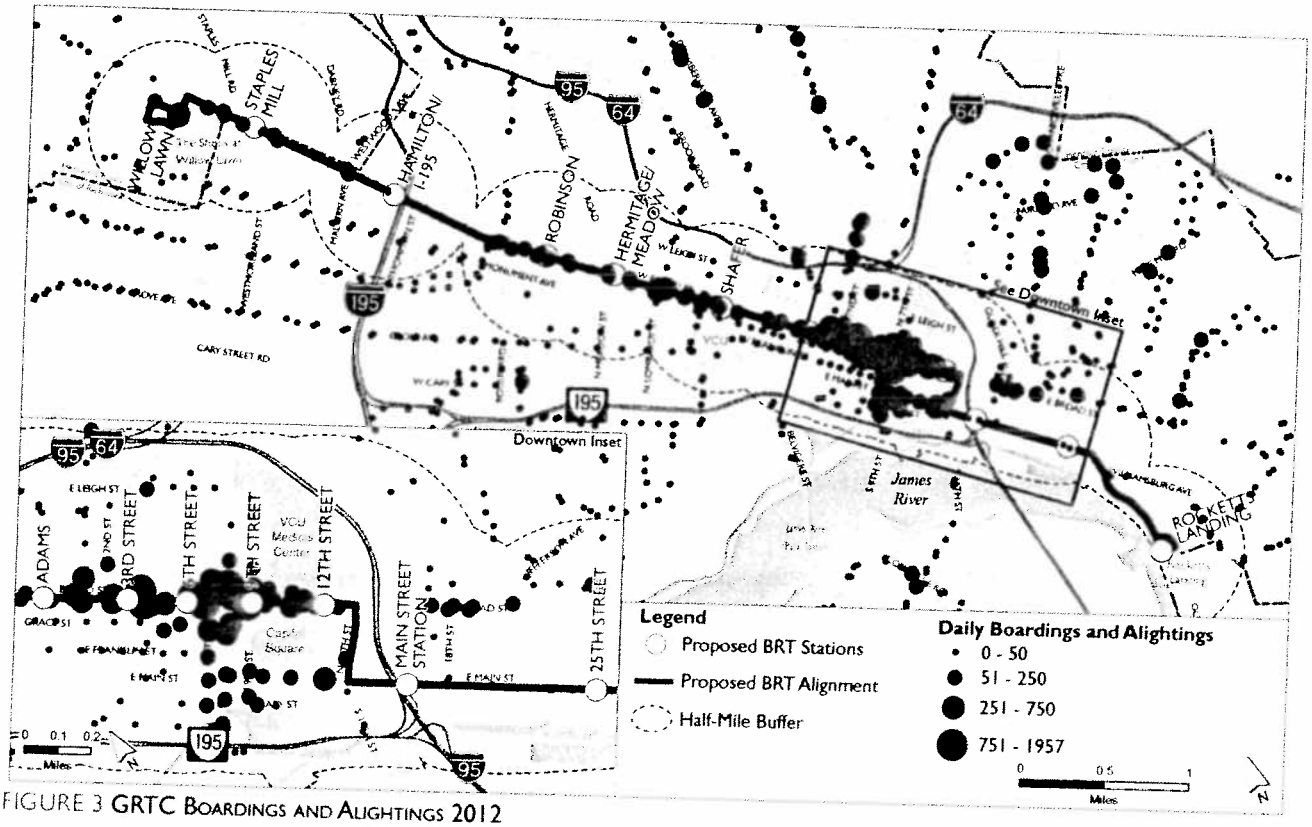



FIGURE 3 GRTC BOARDINGS AND ALIGHTINGS 2012


PHOTO OF BUS OPERATIONS ON BROAD STREET

BUS STOP AT BROAD AND 4TH STREETS.

## Summary of Challenges in the Corridor:

- Long travel times for bus riders.
- Service delays due to bunching.
- Substandard bus lane widths.
- Lack of bus lane exclusivity in off-peak times.
- Reduced level of service for motor vehicles and buses.
- Congested regional interstates increasing travel time delay and costly commutes for vehicular traffic accessing the corridor.
- Limited and unreliable local access to employment, reatil, educational instiutions, and health care services for transit-dependent populations.
- Lack of permanent infrastructure investment to support development and redevelopment initiatives that would stimulate the economy of the metropolitan area.

RENDERING OF BRT STATION AT ADAMS STREET

## Summary of Broad Street BRT Benefits:

- Increase bus speeds by approximately 50%.[3]
- Reduce travel time for riders on BRT by approximately 33%.[4]
- Provide a permanent transit investment in the Broad Street corridor that will encourage economic development and stimulate property values.
- Attract new riders by providing a service with travel times that are competitive with the automobile.
- Improve the reliability of transit operations on Broad Street by providing a dedicated lane for BRT vehicles from Thompson to Adams Streets and by improving the dedicated bus lane between 4th and 14th Streets.
- Expand the range of job opportunities for transit-dependent populations by increasing the areas accessible within a reasonable commute time.
- Create additional opportunities to increase system-wide efficiency for GRTC and further improve service on local routes.
- Leverage opportunities for mixed-use, transit-oriented development that will revitalize an economically distressed corridor and improve jobs-housing balance.
- Improve pedestrian safety at station areas with improved crosswalks and pedestrian refuge areas at station platforms.


## II. Project Parties

The Broad Street BRT project will be constructed and operated by GRTC and sponsored by a collaborative partnership encompassing two agencies and two local jurisdictions with the goal of bringing BRT service to Richmond. The partners include: GRTC Transit System, the Virginia Department of Rail and Public Transportation, the City of Richmond, and Henrico County. The BRT project is further supported through various public and private stakeholders (e.g., Greater Richmond Chamber of Commerce) who see opportunity and economic stimulation as a potential result of the project. Please refer to APPENDIX A for letters of support and commitment.

### Greater Richmond Transit Company (GRTC): *Owner, Operator, Sponsor, Implementer*

GRTC TRANSIT SYSTEM

GRTC is the principal public transportation provider for the Richmond urbanized area. GRTC provides fixed-route, paratransit and specialized transportation services to the City of Richmond, Henrico County and express routes to other surrounding localities. Founded in 1860, the public transit system, known today as GRTC, has operated continuously for over 150 years. Jointly owned by the City of Richmond and Chesterfield County, the transit agency was purchased from private owners and incorporated as GRTC on April 12, 1973.

### Department of Rail and Public Transportation (DRPT): *Sponsor*

DRPT Virginia Department of Rail and Public Transportation

The mission of the Virginia Department of Rail and Public Transportation is to improve the mobility of people and goods while expanding transportation choices in the Commonwealth. DRPT is the primary state level planning and funding agency for public transit improvements in Virginia. DRPT has helped to lead planning efforts for the Broad Street BRT environmental process and is a funding partner for the project.

### City of Richmond, Virginia: *Sponsor*

RICHMOND VIRGINIA

The City of Richmond is the capital of the Commonwealth of Virginia with a population of 214,114. It is also the commercial and cultural center of a metropolitan statistical area that is home to over 1.25 million people. The City of Richmond is part owner of GRTC and provides annual operational funding for most GRTC routes. Ninety-six percent (96%) of the BRT corridor falls within the City of Richmond. The City is also a funding partner for the project.

### Henrico County, Virginia: *Sponsor*

CITY 1611 · SHIRE 1634 · MANAGER 1934 · COUNTY OF HENRICO, VIRGINIA

Henrico County is one of the oldest communities in the country. Henrico County is approximately two-hundred forty-four (244) square miles in area and surrounds the City of Richmond on three sides. Henrico County is home to 318,611 residents and provides operational funding for GRTC routes that serve both the east and west ends of the county. Four percent (4%) of the BRT corridor falls within Henrico County. Henrico County is also a funding partner for the project.

***Twenty-one letters of support in APPENDIX A illustrate the broad and dedicated support for this project. This is the only TIGER grant application in 2014 supported by Governor Terry McAuliffe, the City of Richmond, and Henrico County. A dozen community and business groups also firmly expressed support for the project.***


## III. Grant Funds and Sources / Uses of Project Funds

The Broad Street Rapid Transit Study, underway since 2009, has completed environmental documentation, alternatives assessment and cost estimation to determine the best transit alternative for transit in the Broad Street corridor. Capital and operating costs estimates were developed during the study using FTA guidance. The capital cost estimates from the study included costs for preliminary engineering ($4 million). Funding for preliminary engineering is already included in the Commonwealth of Virginia Six-Year Improvement Program for Fiscal Year 2015 and the City of Richmond has committed the necessary local match. These committed funds are not part of this project. Therefore ,the total cost for final design and construction of the Broad Street BRT project, and the basis for the TIGER Grant Funding Request, is $49.8 million in 2015 dollars.[9] TABLE 1 shows the capital cost estimate breakdown. This grant application seeks to fund 50% of the final design and construction costs with the remaining 50% to be leveraged with non-Federal project partner funds. A TIGER Grant will help expedite the construction of this project and the attainment of its benefits.

**TIGER Amount Requested = $24,900,000**

TABLE 1: Capital Cost Estimate

| Category/Element | Costs (2015 Dollars) |
|---|---|
| 10 GUIDEWAY & TRACK ELEMENTS | $4,115,220 |
| 20 STATIONS, STOPS, TERMINALS, INTERMODAL | $4,015,600 |
| 30 SUPPORT FACILITIES | $0 |
| 40 SITEWORK & SPECIAL CONDITIONS | $11,454,030 |
| 50 SYSTEMS | $9,773,160 |
| 60 ROW, LAND, EXISTING IMPROVEMENTS | $1,847,750 |
| 70 VEHICLES | $9,831,780 |
| 80 PROFESSIONAL SERVICES | $6,155,950 |
| 90 UNALLOCATED CONTINGENCY | $2,558,330 |
| **TOTAL PROJECT COST** | **$49,751,830** |

NOTE: Costs are in 2015 dollars. Source: Broad Street Rapid Transit Study Captial Cost Estimate Report. Professional Services excludes the $4 million for preliminary engineering that is already funded.

**Capital Funding.** The TIGER Grant would cover 50% ($24.9 million) of capital funding for final design and construction of the Broad Street BRT. The remaining funding will come from non-Federal leverage funds expected from project sponsors: DRPT will provide 34% ($16.9 million) with the remaining 16% provided by the City of Richmond ($7.6 million) and Henrico County ($400,000). FIGURE 4 shows the breakdown of capital funding by source.

DRPT has the capacity to assist with capital funding for the Broad Street BRT project and, as noted above, DRPT has already supported planning, environmental documentation and preliminary engineering for the project. In 2013, the Virginia General Assembly passed a major transportation revenue and reform package that included new revenues for mass transit. As a result, the Commonwealth Mass Transit Trust Fund, which supports capital funding for transit in Virginia, will increase by $15.8 million in FY2015. This will increase total statewide capital funding capacity in FY2015 to approximately $66.5 million.[10]

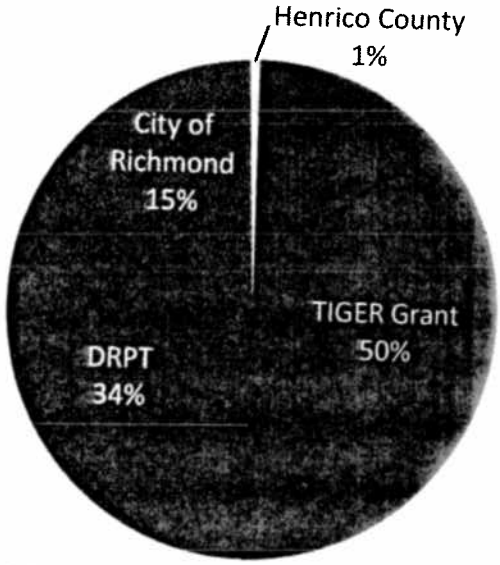



FIGURE 4: Capital Funding Percentage Breakdown


The City of Richmond has capacity to fund its local match of $7.6 million for the Broad Street BRT project. The City Capital Improvement Program (CIP) Budget for the next five years averages $170.4 million including an average of $29.9 million funded through "Pay-as-you-go Sources."[11] The City plans to add the local commitment for final design and construction costs to its next CIP with funding included in FY2016 to FY2018 through "Pay-as-you-go Sources." The addition of the Broad Street BRT would increase the City's CIP budget for FY2017 by an estimated $3.82 million (the highest anticipated year of expenditure), which would increase the CIP budget by only 2.7%.

Henrico County anticipates funding its share of capital costs through its general fund in FY2016 through FY2018. The County's FY2014 general funding commitment to GRTC was $5.14 million.[12] The expected FY2017 capital cost contribution from Henrico County would be $160,000, only a 3% increase in overall funding from the County for GRTC.

***All sponsoring parties have adequate funding capacity and have clearly stated strong support for funding the capital and operating expenses of Broad Street BRT.***

**Operations and Maintenance Funding.** Operating costs, including regular maintenance costs, for the entire GRTC system, including the Broad Street BRT project, were estimated in 2015 dollars as part of the Broad Street Rapid Transit Study. The incremental additional operating costs associated with the Broad Street BRT project will be about $400,000 in 2015 dollars.[13] Farebox revenue is expected to cover about 20% of operating costs ($80,000) based on the typical farebox return of 24% for the entire GRTC system. DRPT is expected to fund 24% of operating costs ($96,000) through its normal annual state operating assistance to GRTC. The City of Richmond and Henrico County would cover the remaining 56% of operating costs ($224,000) through their established annual payments to GRTC.

DRPT provides operating funding assistance to GRTC through the Commonwealth Mass Transit Trust Fund. For the last four years, the average operating funding assistance from DRPT to GRTC has been approximately $7.9 million.[14] Therefore, the additional funding required would constitute only a 1% increase in DRPT operating assistance.

The City of Richmond provides annual funding to GRTC for operations. For the last four years that annual funding has averaged approximately $11 million. Henrico County similarly provides annual operating assistance to GRTC for fixed-route and paratransit service. In the last four years, operating assistance from Henrico County for fixed-route services has averaged $3.2 million, while total mass transit funding has averaged $5.1 million.[11] Therefore, the total additional operating assistance required from both jurisdictions is less than a 2% increase in funding. Both jurisdictions have expressed strong support for the operations, as well as construction, of the project (see APPENDIX A Letters of Support).


## IV. Selection Criteria

### A. Primary Selection Criteria

This section focuses on how the Broad Street BRT will meet and exceed the eligibility requirements considered for the primary selection criteria.

#### i. State of Good Repair

The Broad Street BRT will enhance the performance of Richmond's existing transportation system. State of good repair benefits include asset management for buses, reduced vehicle miles traveled, and return of public investment.

Asset Management. To maintain a State of Good Repair, GRTC has established maintenance and replacement policies for its buses including the following:

- Preventive maintenance inspections every 6,000 miles with AVM2 vehicle monitoring devices on buses;
- As-needed overhauls based on oil sample results (approximately 20 to 24 per year); and,
- Replacement every 12 years.

The Broad Street BRT will use compressed natural gas (CNG) powered vehicles. GRTC is phasing in CNG vehicles to replace its entire fleet, and instituting BRT service will speed that process. GRTC will use the RTA Fleet Management System, currently used for bus inventory and maintenance, for BRT.

Reduction of Vehicle Miles Traveled. The BRT system is expected to provide transit passengers with an enhanced and efficient bus service along the existing GRTC routes on Broad Street, 14th Street, and Main Street. The BRT can be expected to reduce regional vehicle miles traveled (VMT) in part because it supports mixed-use development in a corridor that serves the major regional employment center. Specifically, RAMPO land use forecasts indicate an improved jobs-housing balance and increased land use densities in the corridor. The forecasts predict a 22% increase in population and a 13% increase in jobs in the corridor from 2008 to 2035, improving the jobs to population ratio from 2.31 to 2.14.[14] The forecasts predict an annual average growth rate of 0.4% for the City of Richmond from 2008 to 2035.[15] The BRT project has the potential to draw more residential development into mixed uses along the corridor, enabling more trips via transit and lower rates of vehicle ownership – both of which will reduce VMT.

Optimize Return of Public Investment. The planned conversion of GRTC's bus fleet to CNG is expected to lower unit fuel costs. GRTC expects many routes and the system will see efficiency improvements from the project. Broad Street BRT will help make transit safer, more reliable, and desirable in Richmond and will reduce household transportation costs. The project provides an efficient transportation service at minimal cost compared to light rail or streetcar service, yet the investment will provide much of the same economic benefit to Broad Street as costlier transit modes. As the Benefit-Cost Analysis documents, the overall benefits of Broad Street BRT outweigh the costs by a factor of 1.98.

Summary of State of Good Repair for Broad Street BRT:

- Reflects a comprehensive understanding of the system, its condition and its strategic direction.
- Supports the enhancement of the transit service, while maintaining and improving the overall condition of the basic infrastructure.
- Ensures current service levels are supported.
- Keeps maintenance practices current.
- Incorporates asset replacement.
- Supports the seamless transition of the system from start-up mode, to renewal mode.

***The Broad Street BRT provides an <u>increase in transit service</u> combined with operating efficiencies that will benefit much of the GRTC system. The relatively modest capital investment will provide travel time savings, enhanced reliability, and engender a sense of permanence.***


### *ii. Economic Competitiveness*

The Broad Street BRT project is expected to have a number of positive benefits to economic competitiveness including efficiency improvements from reduced travel times and cost savings to new riders. Since a large share of the corridor is currently classified as an Enterprise Zone, the benefits of the project will enhance economically distressed areas. Quoting the letters of support from local organizations that seek better access to jobs to reduce poverty:

> *"Nearly 27% of the citizens of the City of Richmond are in poverty. The Brookings Institution, in its May 2011 report Missed Opportunity: Transit and Jobs in Metropolitan America, said that metropolitan Richmond was 92nd among the nation's 100 largest cities in access to jobs by public transportation. Our own studies confirm this conclusion – only 27% of our jobs are accessible."* (MAGGIE L.WALKER INITIATIVE LETTER OF SUPPORT, APPENDIX A)

**Movement of Workers or Goods.** The Broad Street BRT project will reduce travel times for riders in the corridor and connect critical employment destinations, improving worker productivity. Cities with higher densities support greater productivity but require higher levels of transit to support that density. The Broad Street BRT corridor already serves some of the highest population and employment densities in the Richmond region and is seeing additional development and redevelopment. The Broad Street BRT project will contribute to long-term growth and productivity of the regional and US economies by supporting greater density in the Richmond regional core.

The Broad Street BRT will increase efficiency immediately and in the long-term for workers, residents, visitors and students in the corridor. By 2015, approximately 37,000 people will live in the corridor and over 80,000 people will work in the corridor.[7] Over 31,000 students attend, and over 20,000 people work at, Virginia Commonwealth University (VCU) at its two campuses and medical center in the corridor.[16] Critically, the Broad Street BRT project will provide a direct and rapid transit connection between the Monroe Park and MCV campuses. Additionally, access from the BRT project will better connect the Richmond region to VCU Medical Center, an 865 bed medical center that saw over 85,000 ER visits and handled over 580,000 outpatient visits in 2013.[16] The Broad Street BRT project will also provide a direct connection to Main Street Station, a multimodal hub for the region that served over 38,000 Amtrak patrons and nearly 130,000 Megabus riders in 2013.[18] In the long-term, plans are to expand the number of trains serving Main Street Station, and the BRT project will support the economic benefits of this expanded passenger rail service.

Broad Street BRT will also ancillary travel benefits beyond just the direct transit time improvements. For example, motorists can enjoy faster travel times as more people use the BRT. Broad Street BRT will also likely help reduce average dwell times for other buses that serve Broad Street downtown. Specifically, the consolidation of stops in the improved downtown bus lane will result in fewer stops for all buses from 4th to 14th Streets. At those consolidated stops, only electronic fare media will be accepted, which should reduce the dwell time for local buses. Together, these improvements will reduce bus queuing at some of the corridor's busiest bus stops and transfer points. The associated travel time savings for other bus routes and passengers, while not quantified, could lead to additional productivity gains.

The primary immediate benefit from Broad Street BRT will be shorter travel times for transit riders in the corridor. Compared to a No-Build scenario, BRT will reduce average transit trip time by 6 minutes and end-to-end transit trip time by 14 minutes or 38%. These travel time benefits will substantially improve access to jobs, educational institutions, retail, and health care services, particularly for transit-dependent populations *When monetized, the travel time savings will yield $1.6 million per year (2014 dollars) in increased productivity. This equates to $14.6 million when discounted at 7% over 26 years.*

**Economically Distressed Areas.** The city's high poverty rate and low accessibility to jobs can be addressed not only through improved access provided by BRT, but also through redevelopment activity in the BRT corridor. The need for better access is acute as Richmond has the highest poverty rate in Virginia, at 27%. The project will improve access to jobs, major educational institutions, retail options, and major regional health care centers by reducing travel times. It will improve access by extending transit to Rocketts Landing and it will improve access by stimulating redevelopment in a corridor with high vacancies.

In 2010, the Broad Street Rapid Transit Study completed a land use and development potential


assessment of the corridor, all but three station areas have medium to high development potential, due mainly to the high degree of underutilized properties in the corridor.[17] In most station areas 20 to 30% of the land area is underutilized, and in the Rocketts Landing station area over 30% of the land area is currently vacant. FIGURE 5 shows the distribution of vacant and underutilized land in the corridor. Furthermore, most of the project corridor is within a City or County recognized Enterprise Zone, which provides multiple benefits for new business development in recognition of the need for reinvestment in the area.

Despite vacancies and underutilized properties in certain blocks along the corridor, and auto-oriented suburban development on the west end, the majority of Broad Street retains the walkable, pedestrian-friendly urban fabric that has historically supported commerce and development. The historic urban areas consist of smaller blocks, a grid of streets, a variety of uses and street activity which correspond to greater multimodal facilities and improved mobility for transit users. Broad Street BRT will help stimulate activity in the corridor with higher quality transit service and help to spur additional reinvestment in the corridor, leading to redevelopment of underutilized and vacant properties. *Broad Street BRT will help build "ladders of opportunity" for poorer residents to climb with better access to jobs, eduction, retail and health care centers by reducing travel times, extending transit, and spurring redevelopment and new development.*

**Economic Productivity of Land, Capital, or Labor.** Broad Street BRT could improve the integration of land use and transportation, and stimulate development and redevelopment along the corridor. Following BRT construction, the Euclid Corridor (HealthLine BRT) in Cleveland attracted substantial development and investment.[19] The Euclid Corridor and the Broad Street corridor share similar characteristics. Both corridors connect from a central business district to outlying suburban areas and both serve prominent educational and healthcare institutions. As was the case with certain sections of Euclid Avenue, downtown Broad Street was the former commercial anchor of the region, with multiple flagship department stores. With the rise of suburban shopping malls and increased reliance on automobiles by area residents, this once-vibrant corridor experienced continuing decline. In recent years, some of those empty storefronts have been

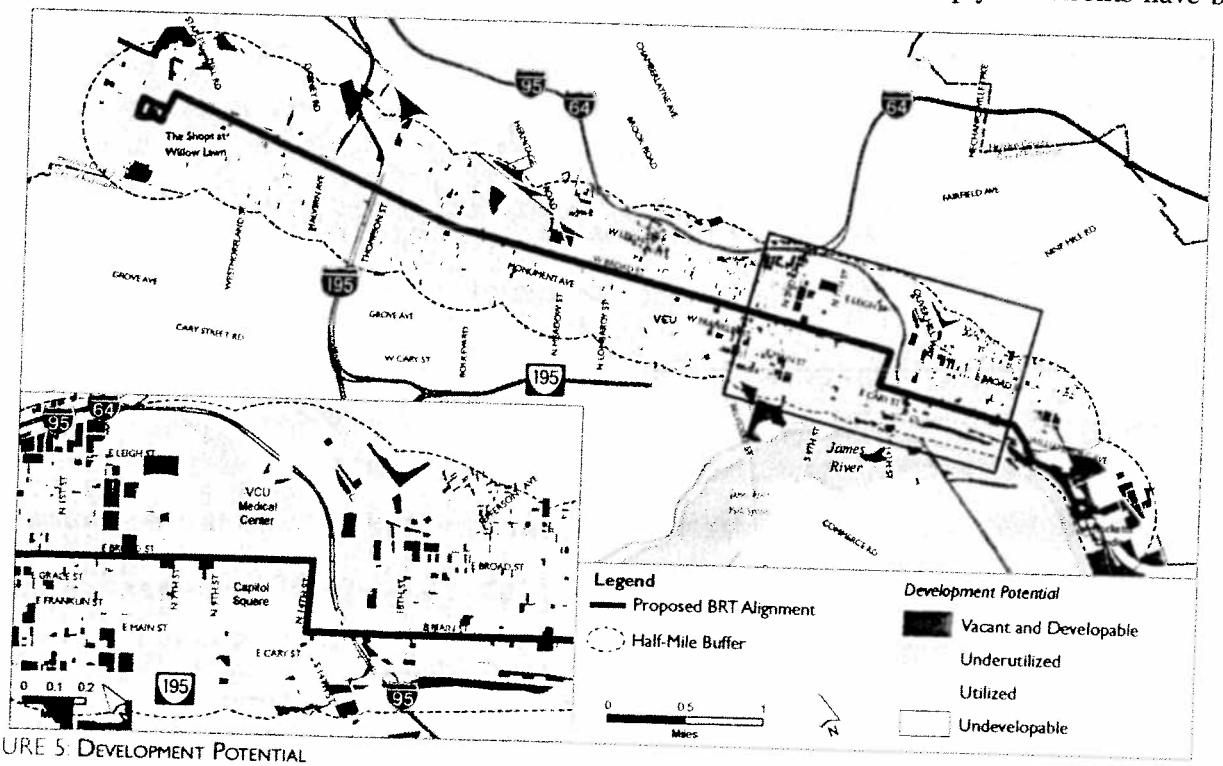



FIGURE 5: DEVELOPMENT POTENTIAL


redeveloped into hotels and condominiums, especially in the vicinity of the Convention Center and Richmond Center Stage.

Broad Street BRT could further enhance the corridor's image and stimulate residential demand, particularly for those residents seeking to reduce their dependence on automobiles. Given increased demand, residential vacancy will continue to fall, potentially leading to additional development and redevelopment. In fact, market activity suggests that this urban residential demand already exists. Discussions with real estate brokers confirm this trend.

Broad Street BRT will also increase mobility and accessibility for Henrico County residents, particularly as new projects come to fruition in the corridor. In addition to the activity at Rocketts Landing (the first Urban Mixed-Use Project in the county), several other notable projects have been proposed near Broad Street BRT. Venture Richmond cataloged more than 50 downtown development projects completed or underway during 2013 and 2014 totaling $1.2 billion in investment, 2,510 housing units, 454 hotel rooms, and 1.6 million square feet of commercial space.[20] Libbie Mill, located within ¾ mile of the proposed Willow Lawn terminus, represents a $434 million mixed-use project and is scheduled to offer apartments (1,096 units), 994 for-sale homes (condos townhomes and single-family homes), 160,000 square feet of office and retail.[21] The future residents of Libbie Mill will inevitably benefit from the availability of BRT service in the county.

Furthermore, BRT can help increase sales at current establishments and potentially trigger additional retail development. Willow Lawn, an outdoor shopping center with restaurants, retail, offices, and services, could see higher sales due to enhanced accessibility. In addition, continued residential development may lead to increased demand for retail, restaurants and services. Ultimately, higher retail sales and additional business development will yield higher tax revenues (sales, meal, admission, and BPOL) for the local governments.

Case study research (Cleveland, Ohio; Boston, MA) shows that BRT can act as a catalyst for new development initiatives and, in some cases, increase the pace of development. BRT's success as a development catalyst ultimately depends on complementary land use policies, supportive economic development strategies and the type of service provided. The Richmond Downtown Master Plan provides strong recommendations for mixed-use and transit supportive development that will support economic development. As residential activity increases in downtown Richmond, the retail market will likely respond to the increased demand for local goods and services. The BRT project represents a substantial and permanent transportation investment that has the ability to be a catalyst for higher density growth and greater commercial activity in the corridor.

Few research studies have been dedicated to quantifying economic impacts associated with BRT systems. Given these data constraints, GRTC and the City of Richmond conducted an exhaustive quantitative analysis of the Euclid Corridor in Cleveland, Ohio. The Euclid findings, highlighted in the Benefit-Cost Analysis (APPENDIX B), were applied to specific components of the Broad Street analysis. This data analysis was supplemented by interviews with planning and economic professionals in the City of Richmond and Henrico County to estimate property value benefits. *The results show that the Broad Street BRT project will increase land values by $72.8 million (discounted at 7%) over 26 years.*

**Job Creation.** Construction of the Broad Street BRT project will result in direct, indirect, and induced impacts in spending and job creation. Based on guidance from the Council of Economic Advisors on transportation infrastructure spending, the $49.8 million spent on final design and construction will lead to the creation of 647 job-years. Based on the project schedule, most of these job-years will be created in 2016 and 2017. About 80% of the spending is expected to occur within the Richmond region and therefore, is likely to improve conditions in the economically distressed communities in the corridor.

CENTRAL NATIONAL BANK TOWER, 3RD STREET AND BROAD STREET

Douglas Development is renovating this tower into a mixed-use building including 200 apartments.


### *iii. Quality of Life*

Broad Street BRT will help make transit safer, more reliable, and desirable in Richmond and will reduce household transportation costs. The project will also promote affordable housing by improving access to a part of the region with higher than average affordable housing rates. The project itself will accomplish these goals, but continued action by partners such as the City of Richmond and Henrico County can extend the quality of life benefits that Broad Street BRT will provide.

**Transportation Choices.** Broad Street BRT will benefit all residents and workers, particularly low-income and other disadvantaged groups in the corridor, by providing additional transportation choices; faster travel times to access jobs, educational opportunities, retail options, and health care centers along the corridor; improved station areas for transfers to other routes; and the induced added development that will increase the supply of jobs in the corridor. The BRT fares will be the same as local GRTC bus fares (currently $1.50), and therefore equally affordable as current transit service. Minority populations and low-income and zero-car households are prominent in the corridor.[2] Approximately 46% of the population in the corridor is considered a racial or ethnic minority. Of the 28 census tracts within the BRT project area, 11 tracts have higher than average levels of minority populations. The predominant minority group in the corridor is African-American. Within the corridor, 20% of households are low income (earn less than 60% of the citywide median income) and five census tracts have low income household levels higher than 20%. FIGURE 6 shows the distribution of census tracts with higher than average low income households and minority populations across the corridor. About 17% of households in the city have no automobiles and are reliant on transit or other means to meet their mobility needs. Households without access to an automobile are widespread throughout the corridor. FIGURE 6 also shows the location of census tracts where zero car households comprise more than 10% of all households.[3]

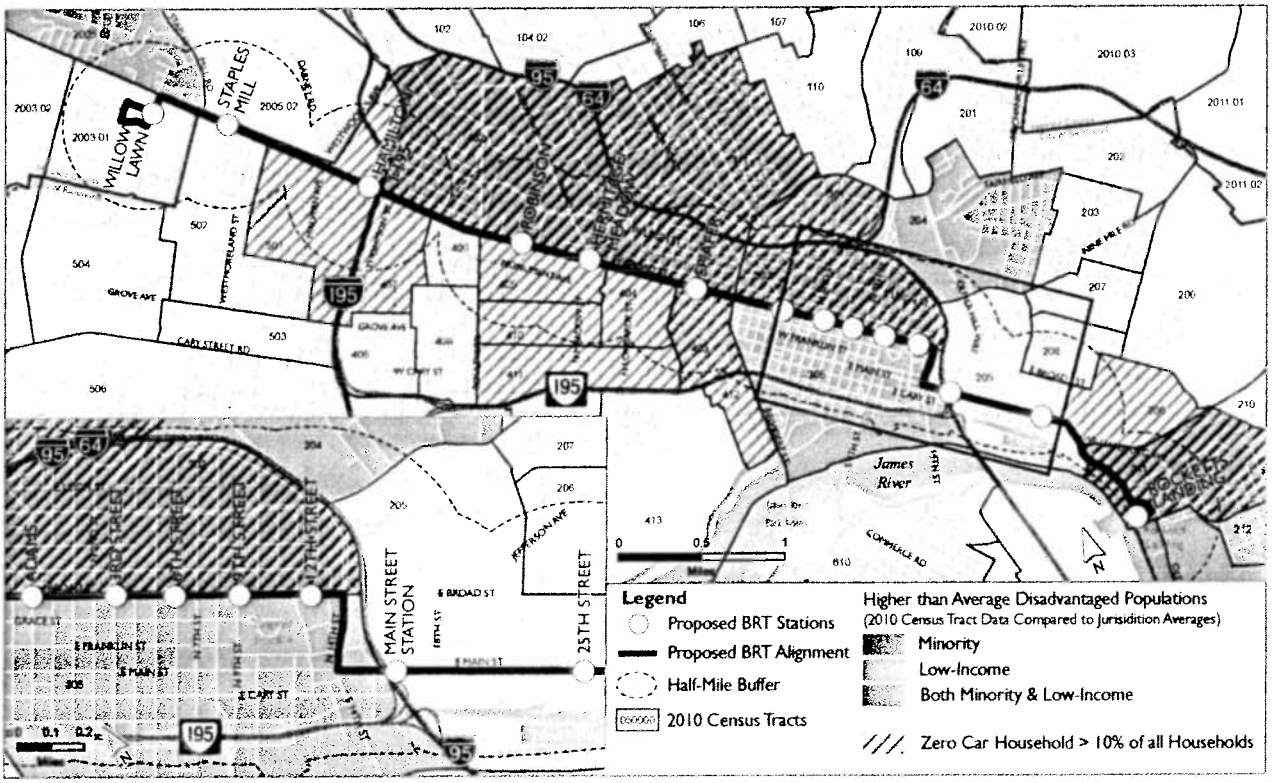



FIGURE 6: DISADVANTAGED POPULATIONS WITHIN THE CORRIDOR


In the long-term, Broad Street BRT will help to improve access to jobs across the region by serving as the initial step in a long-range plan to develop rapid transit throughout the Richmond region. Multiple recent plans and policies developed by the City and private stakeholders have recommended Broad Street BRT as the first step in a regional rapid transit system.

The Mayor's Anti-Poverty Commission was launched by Richmond Mayor Dwight C. Jones in the spring of 2011. The Commission consisted of 40 community members including elected officials, nonprofit and community organization leaders, clergy, and academics. The commission report includes a long-term goal to reduce poverty and an immediate action items to connect residents to sustainable living wage employment. Out of the Mayor's Commission grew the Maggie L. Walker Initiative for Expanding Opportunity and Fighting Poverty. The initiative focuses on resources and investments that build an effective "ladder" out of poverty and provide the support necessary to city residents to climb that "ladder". The initiative's Citizen Advisory Board identified bus rapid transit as one of the highest priority action items.

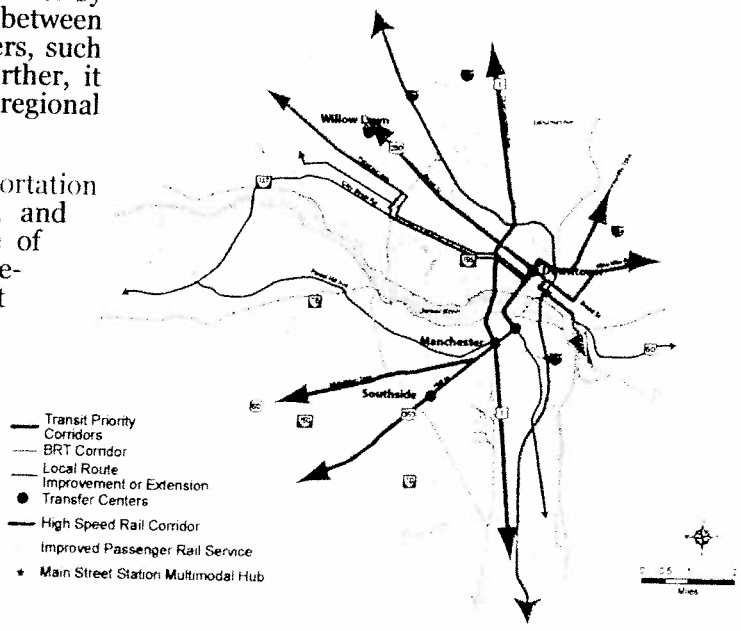
Specifically, the initiative recommends developing a regional bus rapid transit system to unite the regional economy, bolster sustainability, and allow car-less city residents to access suburban job opportunities. The Broad Street BRT will improve mobility along a high-density corridor by increasing travel efficiency and comfort between various neighborhoods and activity centers, such as the retail center at Willow Lawn. Further, it represents the foundational segment of a regional BRT system.

Richmond Strategic Multimodal Transportation Plan (RSMTP) was completed in 2013 and recommended Broad Street BRT as one of the highest transportation priorities. It specifically recommended a series of transit priority corridors on other major arterials and extending into surrounding jurisdictions to create a regional rapid transit system. FIGURE 7 shows the recommended transit and rail improvements from the RSMTP.

Richmond Downtown Master Plan, completed in 2009, recognized the critical need for efficient, reliable transit in downtown Richmond. The Downtown Master Plan envisions substantial revitalization and redevelopment downtown. It also recognizes the importance of transit in shifting the mode share of trips to downtown, limiting the growth of parking, and generally supporting circulation within downtown and the region.

RAMPO Richmond Regional Mass Transit Study was completed in 2008 and explores options for improved transit service along nine corridors. Through a screening process that analyzed demographic, land use and travel demand data, the study identified transit upgrades that could benefit each of those corridors. Suggested improvements included commuter bus, commuter rail, light rail transit and bus rapid transit. The study proposed BRT from Rocketts Landing to Willow Lawn with a feasibility for implementation before 2016. The study recommended extending the BRT line to Short Pump, nine miles west of Willow Lawn, by 2031.

FIGURE 7: TRANSIT RECOMMENDATIONS FROM RSMTP




**Affordable Housing.** Affordable housing options are available throughout the corridor. The major providers of affordable housing in the Richmond region include the Richmond Redevelopment and Housing Authority (RRHA), the Better Housing Coalition and a variety of community development corporations. The Broad Street Rapid Transit Study assessed total affordable housing units in the project corridor, the city, and the county in 2013.[3] There are 15,865 total affordable housing units within Henrico County and the city compared to a total of 229,826 housing units overall.[23] Thus, the portion of all housing units that are affordable within both jurisdictions is 7%. Within the project corridor, there are 1,562 affordable units compared to a total of 17,831 units overall, resulting in 9% of all units being affordable. *The higher proportion of affordable housing units in the corridor, along with observations about income and transit-dependency, support the conclusion that Broad Street BRT will provide transportation choices to those residents in greatest need of mobility.*

**Land Use Planning & Economic Development Coordination.** Density of households, jobs, and activities within a station area and the mix of land uses directly influence the level of transit usage. These attributes are critical to the initial and continued success of transit. In the Broad Street BRT corridor, much of the density, land use mix, and multimodal connectivity is already supportive of transit. As shown in FIGURE 8, population density along the corridor is transit supportive, particularly in the core of the corridor. The highest residential densities for both 2008 and 2035 are located between the Robinson and Adams Streets, with the highest population density at Shafer Street. In addition, employment densities exceed 25,000 jobs per square mile from Shafer Street to Main Street Station, and numerous areas to the west of downtown have density levels over 10,000 jobs per square mile.[24]

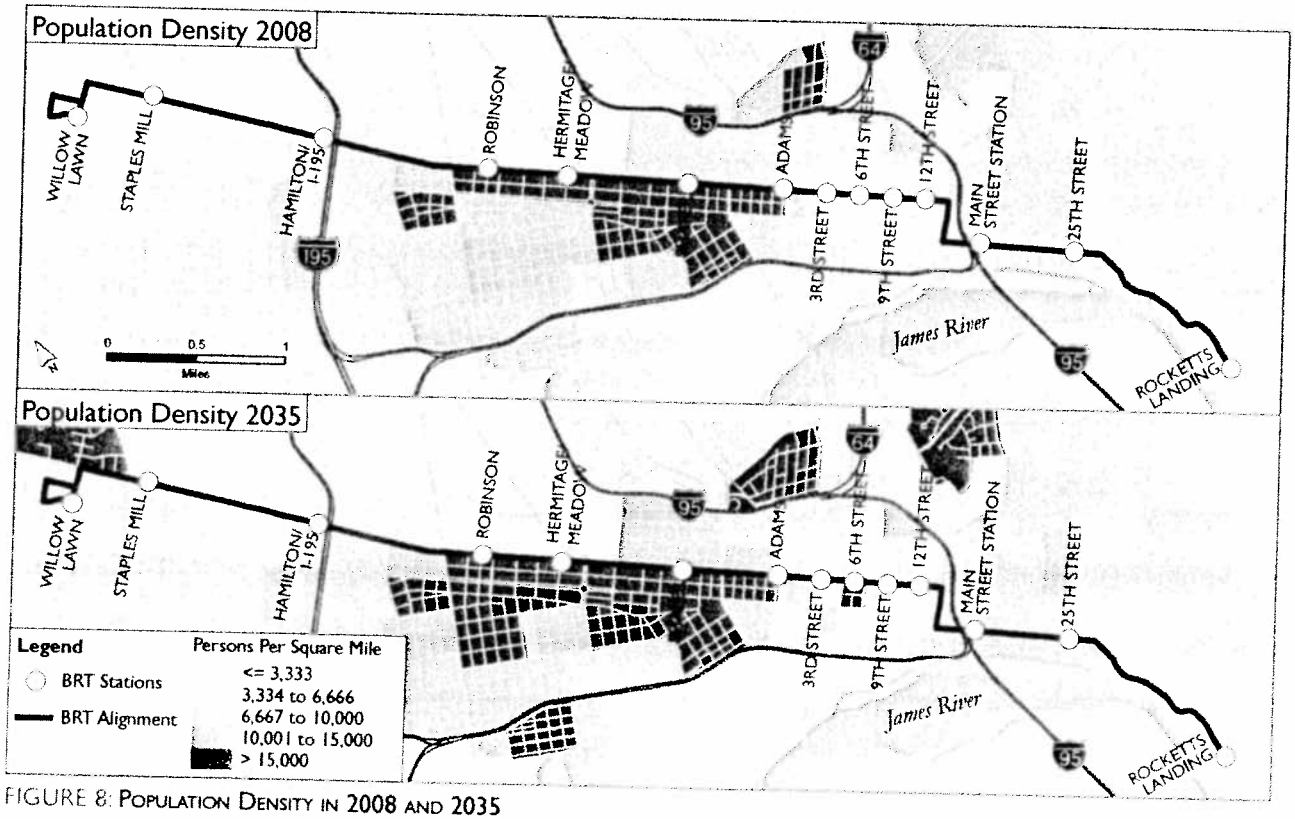



FIGURE 8: POPULATION DENSITY IN 2008 AND 2035


The Broad Street corridor traverses a multitude of diverse neighborhoods and is adjacent to many community facilities. The neighborhoods are supported by many civic and community facilities including the Science and Children's Museums, VCU Monroe Park and MCV campuses, the Library of Virginia, Richmond City Hall, and the Virginia Capitol Building. The sections below will further detail the land use mix, densities, community facilities and other features of the corridor that the Broad Street BRT will enhance, support and improve.

The ***West End District*** begins at Willow Lawn and extends to I-195. In this portion of the corridor, the BRT will run in mixed traffic and will include a park-and-ride facility at the Staples Mill Station by using a portion of the Anthem Headquarters parking lot. This district is largely of suburban and auto-oriented character but maintains a high level of roadway and sidewalk connectivity, particularly south Broad Street. Auto-oriented commercial retail dominates the frontage on Broad Street, while industrial uses dominate north of Broad Street. Neighborhoods such as Sauer's Garden, to the south of Broad Street include single-family housing with some multi-unit units interspersed. The Shops at Willow Lawn is a significant retail and employment center with nearly half a million square feet of retail and office space. Ample opportunities exist in this portion of the corridor for redevelopment with some already underway. For example, the 3600 Center at Thompson Street was recently renovated into a mixed-use building with two floors of office and retail and six floors of apartments, with a total of 191 housing units.[25] City and County land development policies and plans will need to be modified, however, to support a stronger urban form, improve accessibility and mobility, and target urban infill redevelopment in this portion of the corridor. *Broad Street BRT will encourage redevelopment and reinvestment in this part of the corridor by attracting households and employers who desire high quality, rapid transit access to VCU and downtown.*

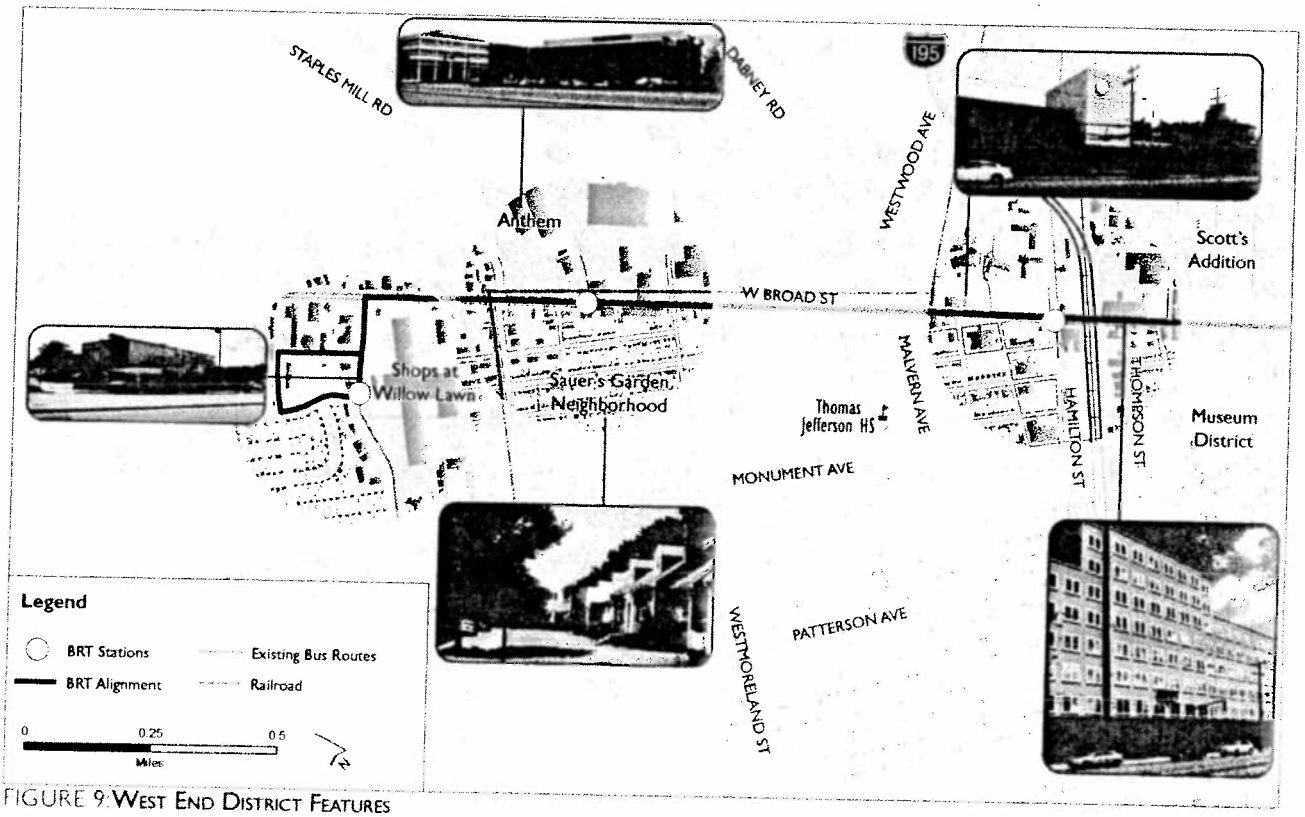



FIGURE 9: WEST END DISTRICT FEATURES


The **Museum/Fan District** extends from Thompson Street to Belvidere Street and it is home to a number of major institutions such as the Science Museum and VCU's Monroe Park Campus. This section of the corridor will be served by a dedicated median running lane for the BRT. This district includes a mixture of suburban and auto-oriented buildings and more pedestrian and transit-friendly character. This district has a high level of roadway and sidewalk connectivity. Auto-oriented commercial retail is more common west of Lombardy Street, particularly on the northern frontages of Broad Street. The areas north of Broad Street are a mixture of industrial, commercial and residential uses, reflecting the transitional character of this area that was previously shaped by industries drawn to the local rail access. South of Broad Street, neighborhoods, such as the Museum District and the Fan include higher density single-family townhomes with many multiple-unit structures interspersed. The eastern portions of this district have seen substantial redevelopment in the last decade, due in part to growth at VCU. Mixed-use development opportunities continue to emerge such as with the RAMZ Apartments at Shafer and Broad Streets with ground floor retail and student apartments above. The current densities and ridership potentials in this district are already supportive of a transit investment, and redevelopment activity underway will likely reinforce this pattern. *Broad Street BRT will support the continued revitalization of this part of the corridor by providing more direct access for employees at VCU and residents of this area who work downtown or in the Willow Lawn area.*

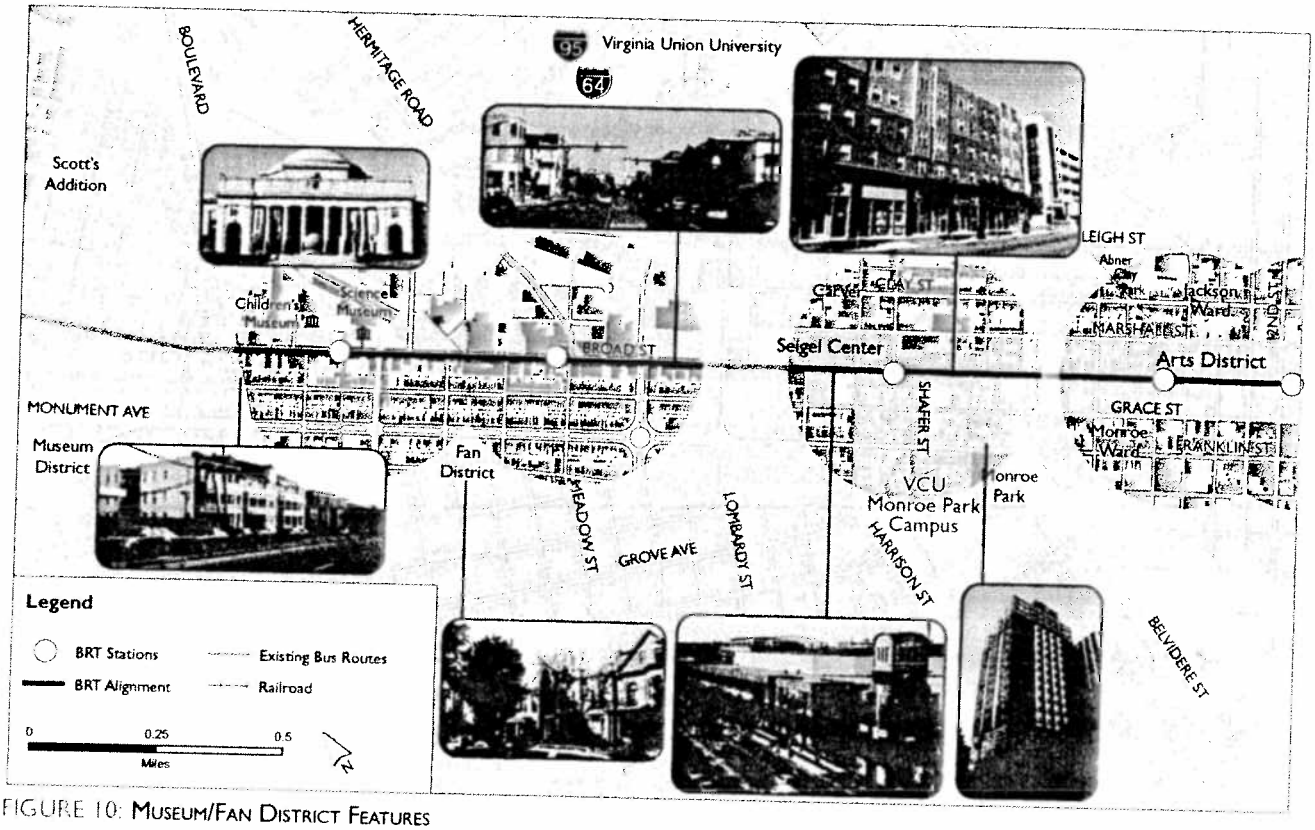
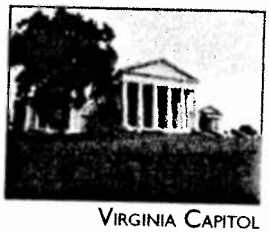



FIGURE 10: MUSEUM/FAN DISTRICT FEATURES


The **Downtown District** is a major activity center with the corridor's largest concentration of jobs and serves as the primary destination for current transit riders. Major destinations and activity centers include the VCU Medical Center and MCV Campus, the state government offices, the Convention Center, and the Coliseum. Broad Street BRT in this district will transition from a median guideway that will end at Adams Street to a curb running bus lane that will run from 4th to 14th Streets. The BRT will follow 14th Street to Main Street where it will continue along Main Street toward Rocketts Landing. While much of the corridor in this district is active and utilized, the section from Belvidere to 3rd Street still has high vacancies. In recent years a burgeoning Arts District has developed and started to fill formerly vacant commercial storefronts. Broad Street BRT will help revitalize the Adams and 3rd Street Station areas by providing higher-quality transit and an alternative means of access for customers, helping to alleviate concerns about parking availability in the area.

A major focus of the City's Downtown Master Plan is improving the job-to-housing ratio downtown to help support more retail and a more mixed-use character downtown. Other key recommendations of the Downtown Master Plan include targeting approvals for development with transit-supportive intensity and density, and urban design features, as well as adopting transit overlays zoning districts or other policies that facilitate transit-oriented development. *Broad Street BRT will support these goals by providing the high quality transit service necessary to support higher densities and minimize the need for additional parking.*

ROBINSON AND MERHIGE U.S. COURTHOUSE



VIRGINIA CAPITOL

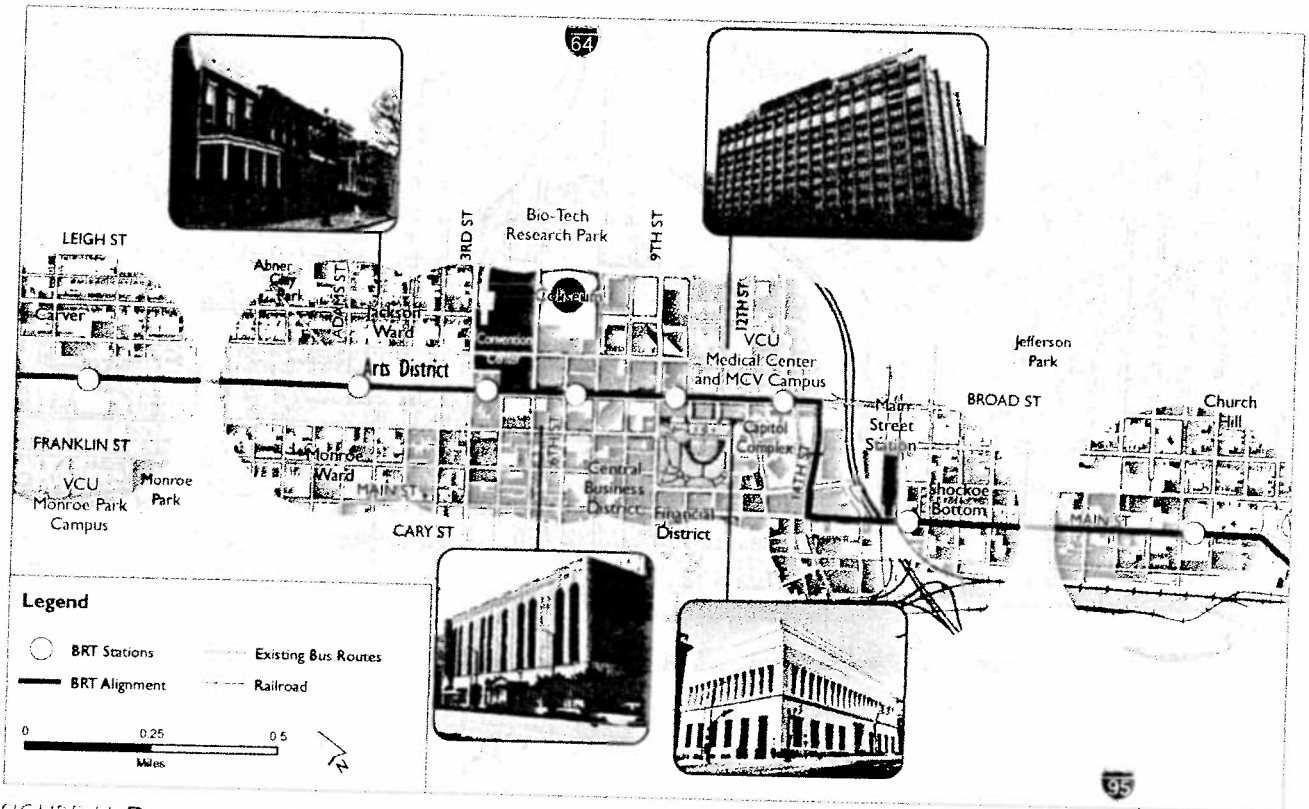
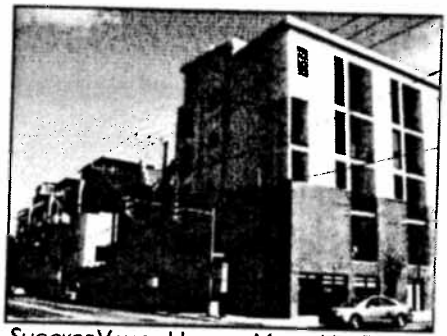



FIGURE 11: DOWNTOWN DISTRICT FEATURES


The **East End District** has a historic development pattern with transit supportive densities overall. With recent residential development the jobs-to-housing balance in the district is improving. In this district, the BRT will operate in mixed traffic along Main Street from 14th Street to Rocketts Landing. Shockoe Bottom from 18th to 26th Streets has seen substantial redevelopment in the last decade with adaptive reuse of tobacco warehouses. In recent years, historic reuse has waned as the existing building stock has been repurposed and new construction has become more common. In this section of the corridor, multimodal connectivity and pedestrian facilities are adequate to good. East of Williamsburg Avenue, however, the corridor transitions to a largely underutilized and vacant industrial condition, with the exception of Rocketts Landing. At Rocketts Landing, WVS Companies is redeveloping a brownfield site [27] into a new mixed-use community with 1,500 residences, 700,000 square feet of office and 200,000 square feet of retail space already built and more planned.[28] Henrico County is supporting this development and established its first Urban Mixed Use Zoning Ordinance to allow for this new development. Multimodal connectivity is currently lacking, with no direct transit service to Rocketts Landing. The City and County are working to complete the Virginia Capital Trail from downtown to Rocketts Landing and on to Williamsburg. Once complete, the trail will enhance multimodal connectivity in the area. *Broad Street BRT will help spur continued development along the entire East End district by enhancing transit service in the corridor and providing transit service to Rocketts Landing.*



SHOCKOE VALLEY HEIGHTS, MIXED-USE PROJECT WITH 198 APARTMENTS, COMPLETED 2011

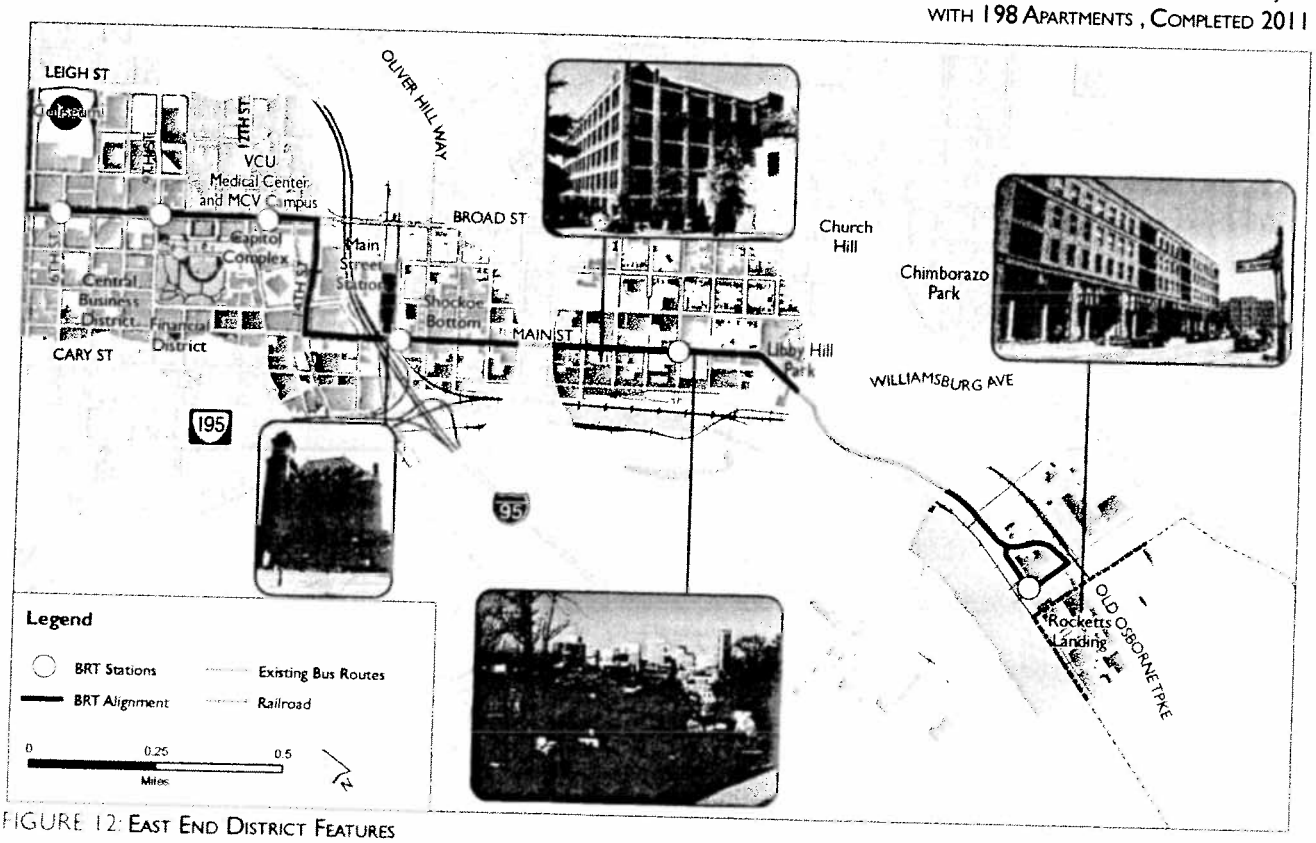



FIGURE 12: EAST END DISTRICT FEATURES


FIGURE 14: RECOMMENDED DENSITY FOR URBAN CENTER AREAS

In summary, the existing conditions along the Broad Street Corridor provide a solid foundation to support new transit investments. In addition various land use and transportation plans and policies in development or underway will work together to support Broad Street BRT. In particular, the City of Richmond has a future land use agenda that prioritizes transit supportive development. The Richmond Downtown Plan calls for a density and mix of land uses compatible with increased transit use. As shown in FIGURE 13, the Downtown Master Plan recommends Urban Center or Urban Core density levels along Broad and Main Streets. FIGURES 14 AND 15 show examples of the density levels the plan envisions for both parts of the BRT corridor in downtown. Overall the plan strongly recommends pedestrian-oriented development patterns and streetscapes, mixed uses and transit supportive density levels. *Together, Broad Street BRT and the supportive plans and policies will help foster more vitality along the corridor, improve the overall jobs-to-housing balance, enhance the existing neighborhoods, revitalize commercial properties and foster development of mixed-use and transit-oriented communities.*

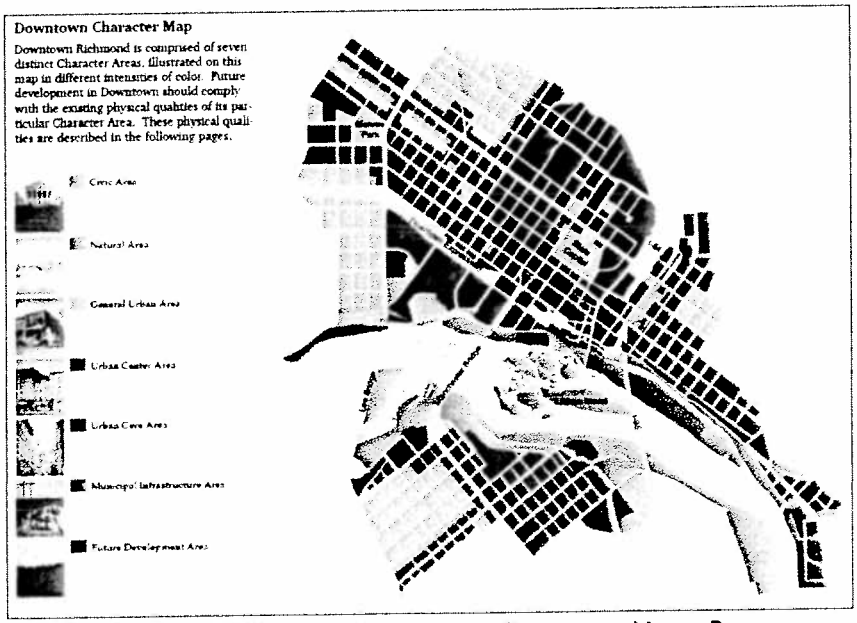



FIGURE 13: DENSITY RECOMMENDATIONS MAP FROM DOWNTOWN MASTER PLAN

FIGURE 15: RECOMMENDED DENSITY FOR URBAN CORE AREAS


### *iv. Environmental Sustainability*

Transportation projects have the potential to affect social, economic, historic and natural resources; therefore, it is essential that the existing environmental conditions and potential project-related impacts are identified and understood. The environmental conditions within the project corridor and their relevance to the project are summarized in TABLE 2.

**Energy Efficiency Improvements & Reductions in Oil Dependence and Emissions.** The Broad Street BRT reduces travel times for transit service in the corridor. As previously identified, the Broad Street BRT will provide a reduction in the travel time of 14 minutes compared to existing conditions in both the peak and reverse peak directions. The combination of automobile competitive travel times, high frequencies and span of service provided under BRT will be particularly supportive of more transit-oriented development by providing a transit service that allows residents and workers in the corridor to access transit without regard to a specific timetable thereby encouraging a much less auto-centric development pattern. Therefore, the BRT will attract riders who would otherwise use personal vehicles for commuting or other trips. These riders will benefit from savings in vehicle maintenance, fuel, and vehicle wear and tear. Based on conservative ridership modeling (SEE APPENDIX B), the BRT will likely attract 490 "choice riders", resulting in 581,000 fewer vehicle miles traveled per year. *The discounted savings in motor vehicle operating costs are equivalent to $118,643 per year, amounting to $1.1 million when discounted at 7% over 26 years.*

**Other Environmental Impacts.** The Broad Street BRT will avoid adverse impacts to sensitive environmental resources. After identification studies and project coordination between GRTC, the DRPT, the FTA, and project team stakeholders, the Virginia Department of Historic Resources (DHR) issued a *Finding of No Adverse Effect* for this project on May 11, 2011. On April 10, 2014, FTA issued a letter establishing a finding that the project meets the criteria for a Class II documented *Categorical Exclusion* as set forth in 23 CFR 771.118(d). TABLE 2 summarizes the effect findings from the environmental analysis that supported the Categorical Exclusion determination by FTA.

### *v. Safety*

Broad Street BRT enhances safety in the corridor by reducing the number and rate of crashes. The project will also maximize the capacity of the existing infrastructure by prioritizing alternative travel modes and creating a more Complete Street, which will increase walking, bicycling and use of transit. These shifts over time will result in a shift away from automobile use and towards calmer traffic.

**Crash Reduction.** By introducing dedicated lanes from Thompson Street to Adams Street, and improving the existing bus lane from 4th to 14th Streets, crash rates along the corridor will be reduced. In the median guideway section of the corridor, one general purpose lane will be converted to a dedicated bus lane, reducing the general travel lanes from three to two in each direction. At certain intersections, the bus lane will be open for left turning vehicles to enter and make turns. Elsewhere along this section, left turns will be prohibited. The effect of this change, from a general traffic perspective, is similar to a road diet. From 4th to 14th Streets, the improved bus lane will function like a shoulder-running bus lane and will reduce conflicts between buses, general traffic, and pedestrians, increasing safety for all users. *Using FHWA crash reduction factors appropriate to both of these contexts, the value of safety benefits from reduced crashes will be $16,300 per year (2014 dollars), equivalent to $150,120 when discounted at 7% over 26 years.*

GRTC CNG Powered Bus


TABLE 2: SUMMARY OF ENVIRONMENTAL IMPACTS REVIEW

| ENVIRONMENTAL RESOURCE | SUMMARY OF EFFECTS |
|---|---|
| LAND USE, ZONING, AND ECONOMIC DEVELOPMENT | The Broad Street BRT is expected to encourage more intense, compact development in localized activity centers around the station areas. This will help to discourage sprawl and will support redevelopment goals and land use policies outlined in local plans. |
| SOCIAL IMPACTS AND COMMUNITY FACILITIES | The Broad Street BRT would contribute to improved transit access, mixed-use development, and connectivity of neighborhoods to community facilities within the study area and greater metropolitan region. |
| DISPLACEMENTS AND RELOCATIONS | No residential, business, industrial, or non-profit property acquisitions or displacements are predicted to occur. |
| ENVIRONMENTAL JUSTICE | Broad Street BRT would support the predicted increases in population and employment by increasing accessibility to jobs, community facilities, and other services in the study area and throughout the region. Environmental justice populations would share in the benefits. |
| HISTORIC PROPERTIES | The Virginia Department of Historic Resources (DHR) has provided a conditional determination of no effect or no adverse effect for the historic architectural resources within the project corridor. During construction, if subsurface impacts deeper than one foot are planned anywhere along the project corridor, an archaeologist will monitor all excavations to identify and evaluate subsurface remains. |
| VISUAL AND AESTHETIC RESOURCES | NEPA and Council on Environmental Quality (CEQ) regulations address visual impacts under the heading of aesthetics and 23 USC 109(h) cites "aesthetic values" as a matter that must be fully considered in developing a project. The Broad Street BRT would not result in any substantial direct, indirect, or temporary construction impacts to visual and aesthetic resources. |
| FLOODPLAINS | Floodplain mapping produced by the Federal Emergency Management Agency (FEMA) indicates the presence of Special Flood Hazard Areas (100-year floodplains) within the study corridor. Only the new Bus Rapid Transit stations at Main Street Station and Rocketts Landing would be constructed within the 100-year floodplain. Construction of these two stations will have minimal impacts to the floodplain with fewer than 2,310 square feet of construction within the floodplain. No substantial effects on natural or beneficial floodplain values and no changes in base flood elevations are anticipated. |
| HAZARDOUS MATERIALS | Land disturbing activities under the BRT project are limited to small areas outside of the roadway right of way for new stations and potential traffic operational improvements. The majority of the project would remain within the existing roadway and right of way. In areas where there would be ground disturbing activities, a Phase I Environmental Site Assessment (Phase I ESA) will be conducted to determine the nature, extent of contamination, and mitigation measures, if any. |
| AIR QUALITY | The BRT project is not expected to cause or contribute any violations of National Ambient Air Quality Standards (NAAQS). Regional levels of criteria pollutants and Mobile Source Air Toxins (MSATs) would likely improve as a result of new abatement technologies and implementation of laws or regulations aimed at improving air quality, as well as the implementation of compressed natural gas (CNG)-powered bus fleet by GRTC. Roadway conditions along Broad Street are forecasted to remain at good levels of service, further supporting cleaner air. |
| NOISE AND VIBRATION | The noise analysis indicates that there are noise sensitive receptors (predominantly residential) within the project corridor. No severe or moderate noise impacts are anticipated from BRT operation. |
| ENERGY | It is likely that the BRT will use less energy than the existing bus services on Broad Street. |

NOTE: The Broad Street BRT project is highlighted on Richmond's Sustainability website at http://gorvagreen.blogspot.com/2013/08/broad-street-bus-rapid-transit-meeting.html


## B. Secondary Selection Criteria

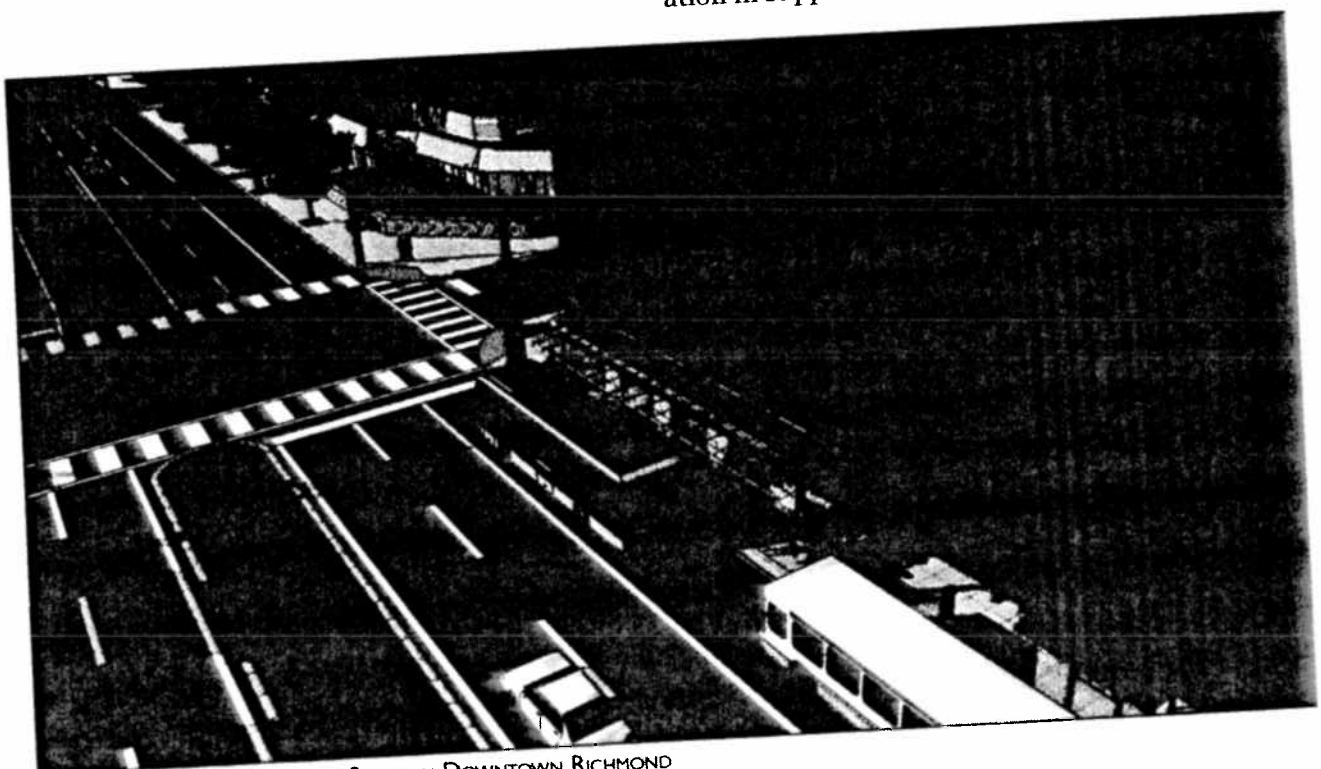
This section focuses on how the Broad Street BRT will meet and exceed the eligibility requirements considered for the secondary selection criteria.

### *i. Innovation*

Broad Street BRT is expected to use a number of features that will be new and innovative to transit in the Richmond region. The BRT stations from Thompson to Adams Streets will be in the median with dedicated stations, which will be a new and unique feature for this service in Richmond. The BRT service will also use an off-board fare collection system which will speed boarding and reduce dwell times. This will be the first transit service in Richmond to use an off-board fare collection system. Additionally, the BRT service is expected to benefit from transit signal priority systems integrated into the corridor signalization system. This will be the first implementation of such a priority system for transit in the region.

### *ii. Partnership*

The Broad Street BRT represents years of collaborative effort to enhance regional transportation options, with participation by multiple agencies, jurisdictions, and highly engaged stakeholder groups. As noted, GRTC, DRPT and RAMPO have worked to plan for an integrated regional transit system since the 2008 Richmond Region Mass Transit Study. The City of Richmond and Henrico County have played an integral role in advancing transit improvements, identifying rapid transit along the Broad Street corridor as an element of their primary comprehensive or master plans governing land use. These plans tie factors such as land use, urban design and economic development into the existing, planned, and recommended transportation infrastructure. The letters of support for this application illustrate the high degree of regional partnering across diverse interests in the corridor and region, including: housing, commerce, tourism, economic opportunity, and the strongest possible local-region-state partnership. The singular support offered to this 2014 TIGER Grant application by Governor McAuliffe, the City of Richmond and Henrico County illustrates not only the high priority but also the high level of cooperation in support of the Broad Street BRT project.



BRT Station Rendering at 6th Street in Downtown Richmond


**Community Involvement.** In addition to the project parties, the community has voiced tremendous support for BRT on Broad Street in Richmond. One example of that support is the recent creation of RVA Rapid Transit, a grassroots organization dedicated to advocating for the construction of a regional Bus Rapid Transit (BRT) system in metropolitan Richmond. RVA Rapid Transit works with residents, government officials and others to illustrate the benefits of BRT and to advocate for the development of a regional rapid transit system. Their website includes architectural sketches of what a proposed BRT station might look like (see FIGURE 16).[29]

Through the Broad Street Rapid Transit Study, stakeholders from across the community were involved in shaping the scope and scale of the project. The Broad Street Rapid Transit Study Policy Advisory Committee (PAC) included representatives from multiple local, regional, and state organizations. The PAC reviewed and adopted the range of alternatives for the BRT and identified funding options and strategies. Specifically, the PAC included representatives from: the Virginia Department of Rail and Public Transportation, GRTC, the City of Richmond, Henrico County, the Greater Richmond Chamber of Commerce, the Greater Richmond Partnership, the Richmond Regional Planning District Commission, the Richmond Metropolitan Authority, Venture Richmond, Virginia Commonwealth University, and the Virginia Department of Transportation. In addition, the Broad Street Rapid Transit Study conducted three sets of public meetings and has scheduled another set of public meetings in May of 2014.

Many other institutions, public agencies and government officials have documented their support for the project, including but not limited to: Governor Terry McAuliffe, Senators Mark Warner and Tim Kane, Mayor of Richmond Dwight Jones, the Richmond City Council, Henrico County Manager John Vithoulkas, the Richmond Regional Planning District Commission, VCU President Michael Rao, the Greater Richmond Chamber of Commerce, Richmond Region Tourism, the Science Museum of Virginia, the Better Housing Coalition, RVA Rapid Transit, and the Partnership for Smarter Growth.

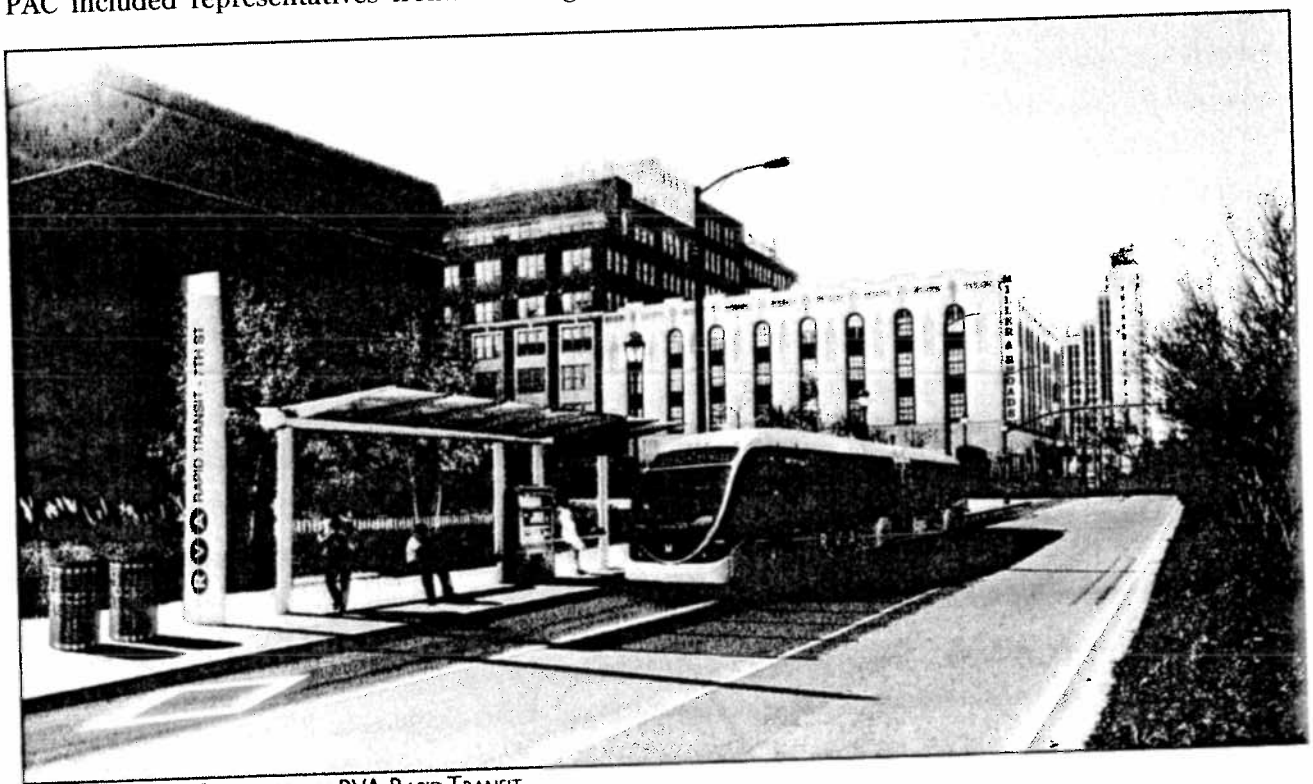



FIGURE 16. BRT RENDERING BY RVA RAPID TRANSIT


## C. Results of Benefit-Cost Analysis

A formal Benefit-Cost Analysis (BCA) was conducted for the project using USDOT guidance, transportation case studies, and professional research and the results are documented in APPENDIX B. The project benefits and costs were discounted to current dollars using the USDOT's recommended 7.0% discount rate and the alternative 3.0% discount rate. The BCA ratios, comparing the discounted benefits and costs are summarized in FIGURE 17. All monetized benefits and costs discussed below are in 2014 dollars and reflect net present values.

The Broad Street Bus Rapid Transit project costs include design and construction as well as annual operating costs. The project will also likely contribute to marginal traffic delays for motorists (approximately 17,000 hours per year), which are also included in the estimated total costs for the BCA estimate. In all, the monetized project cost, including delays, is $47.8 million (7.0% discount rate) or $55.1 million (3.0% discount rate). While the project requires notable investment, the project's BCA indicates that the benefits greatly outweigh the costs.

The project is expected to provide substantial benefits in the form of property value growth, travel time savings for current transit users, reduced vehicle operating costs for motorists who switch to BRT, and crash reductions along key segments of the corridor. When monetized, these benefits amount to nearly $88.6 (7.0% discount rate) or $108.9 million (3.0% discount rate) – yielding a benefit-cost ratio of 1.85 to 1.98. Understanding the inherent risks of double-counting benefits, the assumptions used to quantify these benefits were conservative and pragmatic.

The BCA also addresses the substantial qualitative societal benefits the project will bring. The Broad Street BRT will serve as a critical transit spine for the greater metropolitan area and has the capacity to increase connectivity, improve access to jobs, and enhance the quality of life for under-served residents. The BRT, strategically proposed along a high-density corridor, will serve prominent health care and educational institutions, multimodal centers and other major establishments, while helping stimulate additional investment along an important corridor for local residents and businesses.

FIGURE 17: SUMMARY OF BENEFIT-COST ANALYSIS (BCA) RESULTS

**NET PRESENT VALUE 7% DISCOUNT RATE**

- Net present value of costs: $47.8 million
- Net present value of benefits: $88.6 million
- Total net present value of benefits including costs: $40.8 million
- **BC Ratio: 1.85**

**NET PRESENT VALUE 3% DISCOUNT RATE**

- Net present value of costs: $55.1 million
- Net present value of benefits: $108.9 million
- Total net present value of benefits including costs: $53.8 million
- **BC Ratio: 1.98**


## V. Demonstrated Project Readiness

Broad Street BRT is a result of cooperative regional and local planning and as such, fits the local land use plans in the surrounding corridor. The project study team has been coordinating with FTA and the appropriate resource agencies since 2009 to complete the appropriate documentation of environmental impacts. FTA completed its evaluation of this information in April of 2014. The remaining work for the project is primarily the engineering, design and construction, but the relatively simple roadway, signal, and station improvements proposed are not anticipated to result in any delays during these final stages.

### *State and Local Planning*

BRT has been considered in several of the recent regional and local transportation studies. A 2008 Comprehensive Operations Analysis (COA) of the GRTC proposes BRT for the Broad Street corridor for future assessment. Also in 2008, RAMPO adopted the findings of the Richmond Regional Mass Transit Study, which set forth a transit system plan for the Richmond Metropolitan Area. This study, conducted in coordination with GRTC's COA, produced a plan of action for the development and implantation of regional mass transit programs over the mid-range and long-range with consideration given to corridor prioritization.

### *Environmental Approval*

After identification studies and project coordination between GRTC, DRPT, FTA, and project team stakeholders, the Virginia Department of Historic Resources (DHR) issued a Finding of No Adverse Effect for this project on May 11, 2011. On April 10, 2014, FTA issued a letter establishing a finding that the project meets the criteria for a Class II documented Categorical Exclusion as set forth in 23 CFR 771.118(d).

### *Right of Way & Technical Feasibility*

GRTC has demonstrated in-house capabilities to design and manage construction of the project. The GRTC Project Manager is responsible for project development, planning, design, and construction activities pertaining to capital projects. Past and current projects include project management of design and construction of a new $40 million public transit corporate and heavy industrial maintenance bus facility utilizing sustainable whole building design concepts (LEED), facility modifications for conversion from a diesel fueling facility to CNG utilization, and activities associated with construction of a $4.7 million on-site CNG fueling station.

### *Financial Feasibility*

GRTC and its funding sponsors have identified the sources necessary to fund 50% of the capital costs to build the Broad Street BRT, and the necessary operations and maintenance support. See Section III for details on the expected contribution amounts and sources of funding. As documented, the funding capacity is available and ready, and the parties are preparing to fund the final design and construction phases. Furthermore, DRPT and the City of Richmond have already obligated funds to complete preliminary engineering. Detailed estimates of the costs by category can be found in the Broad Street Rapid Transit Study: Capital Cost Estimation Report. These estimates include factors for several key contingency items, including a 35% professional services component, funds for right of way acquisitions which are currently unforeseen (other than a possible park-and-ride easement), and a significant unallocated contingency ($2.5 million).

GRTC Bus Maintenance Facility, Completed in 2009

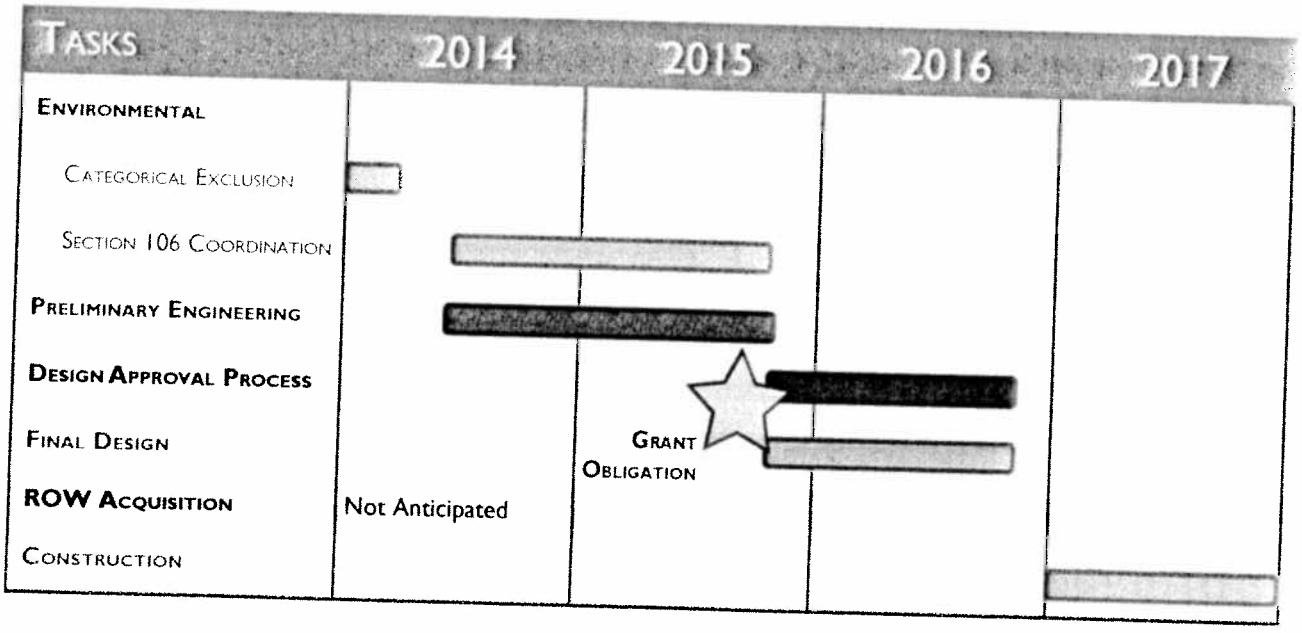

### Project Schedule

FIGURE 18 shows the planned schedule for the completion of preliminary engineering, final design and construction of Broad Street BRT. GRTC is currently developing the Request for Proposal (RFP) for the preliminary engineering phase and anticipates issuing the RFP in May 2014 and awarding a contract in July 2014. FTA has already establishing a finding that the project meets the criteria for a Class II documented Categorical Exclusion for the project. The Virginia Department of Historic Resources, however, will require review of preliminary design plans to ensure they meet stated requirements in their Finding of No Adverse Effect. GRTC anticipates that the TIGER Grant would be obligated at the completion of preliminary engineering in the 4th Quarter of 2015. Final design will require approximately 12 months and be completed in the 4th Quarter of 2016. Construction would then commence in the 1st Quarter of 2017, with expected completion by December 2017 and the opening of Broad Street BRT as soon as possible thereafter. GRTC expects that the project will be constructed entirely within existing roadway right of way and therefore does not anticipate any acquisition of property.

### Project Risks and Mitigation Strategies

Since the project will be constructed within existing right of way and environmental clearance has already been issued, there are few substantial risks to the project schedule. The project will need to be approved through the local design review process by the Richmond Urban Design Committee and Planning Commission. Given the statements of support from the City Administration and City Council, design review is not anticipated to cause delay. Additionally, GRTC is planning to convene a Local Advisory Committee of staff from the City and County Departments of Public Works, Planning and Public Utilities during the preliminary engineering phase to guide the design process and pro-actively address issues prior to final design. Finally, GRTC is also planning to procure the preliminary engineering phase with the option to keep the chosen contractor through final design, which would avoid any procurement delays in the project.

FIGURE 18: PROJECT SCHEDULE




## VI. Federal Wage Rate Certification

GRTC TRANSIT SYSTEM

301 East Belt Boulevard / Richmond, VA 23224 / (804) 358-GRTC (4782)

April 17, 2014

The Honorable Anthony Foxx
Secretary of Transportation
U.S. Department of Transportation
Office of the Secretary of Transportation
1200 New Jersey Ave SE
Washington, DC 20590

Dear Secretary Foxx:

Please accept this letter as certification that Greater Richmond Transit Company (GRTC) shall comply with the employment pay regulations as determined by subchapter IV of Chapter 31 of title 40, United States Code (Federal wage rate requirements). GRTC will ensure that all laborers and mechanics working on a 2014 Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant Program-funded project will be compensated at a rate not less than those prevailing on projects of a similar character in the City of Richmond or the County of Henrico. As a past recipient of federal funds for infrastructure projects, GRTC has made compliance with Federal wage rates a part of its internal financial and grants auditing process. Therefore, USDOT can be assured that, if awarded 2014 TIGER funds, GRTC will implement the proposed Broad Street Bus Rapid Transit project with strict compliance to Federal wage rate requirements.

If you have any questions about this certification that GRTC shall comply with Federal wage rate requirements, please feel free to contact my office. I can be reached at (804) 358-3871.

Sincerely,

David Green
Chief Executive Officer


**Endnotes:**

[1] "In Climbing Income Ladder, Location Matters", *New York Times*, http://www.nytimes.com/2013/07/22/business/in-climbing-income-ladder-location-matters.html

[2] American Community Survey 2011 One Year Estimate, S-1701

[3] Broad Street Rapid Transit Study (RTS), *Detailed Screening of Alternatives*, http://study.ridegrtc.com/documents/

[4] Broad Street RTS, *Transportation Systems Technical Report*, http://study.ridegrtc.com/documents/

[5] Broad Street RTS, *Problem Statement*, http://study.ridegrtc.com/documents/

[6] Broad Street RTS, *Calculation of Linked Trips on Project*, http://study.ridegrtc.com/documents/

[7] AASHTO *A Policy on Geometric Design of Highways and Streets*, 6th Edition, Chapter 4

[8] Florida Department of Transportation – Transit Office Report, *Integrating Transit into Traditional Neighborhood Design Policies – The Influence of Lane Width on Bus Safety*

[9] Broad Street RTS, *Capital Cost Estimate*, http://study.ridegrtc.com/documents/

[10] DRPT Final Capital Allocation Methodology Resources Final Report & Materials, http://www.drpt.virginia.gov/activities/TSDACFinalCapAlloc.aspx

[11] *City of Richmond Proposed Capital Improvement Plan 2013 to 2017*, http://www.richmondgov.com/Budget/documents/CapitalImprovementPlans/2013-2017_ProposedCapitalImprovementPlan.pdf

[12] Henrico County, Approved Budget 2013 – 2014, http://www.co.henrico.va.us/budget/approvedbudfy14/

[13] Broad Street RTS, *Operations and Maintenance Cost Estimate*, http://study.ridegrtc.com/documents/

[14] GRTC Transit Development Plan, http://www.ridegrtc.com/news-initiatives/projects-plans/transit-development-plan

[15] RRPDC Socioeconomic Forecasts, http://www.richmondregional.org/MPO/socioeconomic.htm

[16] VCU Facts and Rankings, http://www.vcu.edu/about/facts-and-rankings.html

[17] VCU Medical Center, *About Us*, http://www.vcuhealth.org/?id=5&sid=1

[18] Amtrak Fact Sheet, Fiscal Year 2013, Commonwealth of Virginia, http://www.amtrak.com/pdf/factsheets/VIRGINIA13.pdf and Megabus (North America) monthly reports to City of Richmond.

[19] The Cleveland Plain Dealer conducted a thorough analysis of development along the Euclid Corridor (2008). The following link shows the map of development activity: http://media.cleveland.com/pdextra/other/Euclid.pdf

[20] Venture Richmond Downtown Development Forum, http://www.venturerichmond.com/development/forum.html

[21] Libbie Mill – Overview, Gumenick Properties, http://www.gumenick.com/images/gallery-smc/2013-10-23/GPLibbieMillOverviewWebFinal.pdf

[22] Broad Street RTS, *Land Use and Multimodal Connectivity Report*, http://study.ridegrtc.com/documents/

[23] For purposes of this analysis, the FTA guidelines for "legally binding affordability restricted" housing units is used. Units must be restricted to renters with income of less than 60% of the area median income or only available for sale to owners who earn less that the area median income.

[24] Broad Street RTS, *Station Selection Report*, http://study.ridegrtc.com/documents/

[25] West Broad office building to become apartments, http://www.richmondbizsense.com/2011/10/31/west-broad-office-building-to-become-apartments/

[27] "Rocketts Landing, Richmond, Virginia, USA, brownfield redevelopment under voluntary remediation", *10th International Association for Engineering Geology and the Environment (IAEG) 2006 Congress, Paper 678*, http://iaeg2006.geolsoc.org.uk/cd/PAPERS/IAEG_678.PDF

[28] Rocketts Landing, Retail & Office, http://rockettsvillage.com/business/retail-spaces

[29] RVA Rapid Transit, Core Vision, http://www.rvarapidtransit.org/core-vision/

# EXHIBIT C

## TIGER Grant Application Narrative

Attached hereto

# UNITED STATES OF AMERICA
# U.S. DEPARTMENT OF TRANSPORTATION
# FEDERAL TRANSIT ADMINISTRATION
# WASHINGTON, DC 20590

# GRANT AGREEMENT UNDER THE CONSOLIDATED APPROPRIATIONS ACT, 2014, (DIVISION L, TITLE I, Pub. L. 113-76, JANUARY 17, 2014), FOR THE NATIONAL INFRASTRUCTURE INVESTMENTS DISCRETIONARY GRANT PROGRAM (FY 2014 TIGER DISCRETIONARY GRANTS)

## GREATER RICHMOND TRANSIT COMPANY

## BROAD STREET BUS RAPID TRANSIT

## FTA FY 2014 TIGER Grant No. VA-79-0001

This Agreement (the "Agreement" or "Grant Agreement") reflects the selection of **Greater Richmond Transit Company** ("Grantee" or "Recipient") as a Recipient of a grant awarded under the provisions of the Consolidated Appropriations Act, 2014 (Div. L, Title I, of Pub. L. 113-76, January 17, 2014)) (the "Act"), regarding National Infrastructure Investments. The grant program under the Act is referred to as "FY 2014 TIGER Discretionary Grants" or "TIGER Discretionary Grants."

## SECTION 1. TERMS AND CONDITIONS OF THE GRANT

1.1 This Agreement is entered into between United States Department of Transportation ("DOT" or the "Government") and the Recipient. This Agreement will be administered by the Federal Transit Administration (also referred to herein as "FTA").

1.2 This Grant is made to the Recipient for the project as described in the Grantee's Application (the "Project") (available at **GRTC.com)** and the negotiated provisions on the Project's material terms and conditions, including the Project's scope, assurance/confirmation that all required funding has been obtained and committed, and the timeline for completion of this [insert "rural" or "urban] project.

1.3 The Government, having reviewed and considered the Recipient's Application and finding it acceptable, pursuant to the Act awards a TIGER Discretionary Grant in the amount of Twenty-Four Million Nine-Hundred Thousand Dollars **($24,900,000),** for the entire period of performance (referred to as the "Grant"). This Grant is the total not-to-exceed amount of funding that is being provided under this Agreement. **Recipient certifies that not less than Twenty-Four Million Nine-Hundred Thousand Dollars ($24,900,000) in non-Federal funds are committed to fund the Project, which**

**satisfies the Act's requirement that at least twenty percent (20%) of the Project's costs are funded by non-Federal sources.** The Recipient agrees that all applicable federal requirements will attach to any project activity, regardless of whether such project activity is 100 percent locally funded. The Government's liability to make payments to the Recipient under this Agreement is limited to those funds obligated by the Government under this Agreement as indicated herein and by any subsequent amendments agreed to in writing by all parties.

1.4 The Recipient agrees to abide by and comply with all terms and conditions of this Agreement and to abide by, and comply with, all requirements as specified in the Exhibits and Attachments, identified in paragraphs 1.5 and 1.6, which are deemed integral parts of this Agreement. Each Exhibit and Attachment identified below is deemed to be incorporated by reference into this Agreement as is fully set out herein.

1.5 This Agreement shall also include the following Exhibits as integral parts hereof located at http://www.fta.dot.gov/grants/about_FTA_15116.html

| | |
|---|---|
| Exhibit A | Legislative Authority |
| Exhibit B | General Terms and Conditions |
| Exhibit C | Applicable Federal Laws and Regulations |
| Exhibit D | Grant Assurances (*Please also see Section 4 herein*) |
| Exhibit E | Responsibility and Authority of the Recipient |
| Exhibit F | Reimbursement of Project Costs |
| Exhibit G | Grant Requirements and Contract Clauses |
| Exhibit H | Quarterly Progress Reports: Format and Content |

1.6 This Agreement shall also include the following Attachments as integral parts hereof:

| | |
|---|---|
| Attachment A | Statement of Work (*Please also see TEAM or TrAMS*) |
| Attachment B | Project Schedule (*Please also see TEAM or TrAMS)* |
| Attachment C | Project Budget (*Please also see TEAM or TrAMS)* |
| Attachment D | Performance Measurement Table |

1.7 In the case of any inconsistency or conflict between the specific provisions of this Agreement, the Exhibits and the Attachments, such inconsistency or conflict shall be resolved as follows: First, by giving preference to the specific provisions and terms of this Agreement; second, by giving preference to the provisions and terms of the Exhibits; and, finally by giving preference to the provisions and terms in the Attachments.

## SECTION 2. RECIPIENT AND PROJECT INFORMATION

Recipient, in accordance with the requirements of the TIGER Discretionary Grant Program, provides the following information:

2.1 Project's Statement of Work Summary (also see Attachment A and TEAM or TrAMS):

The Broad Street Bus Rapid Transit (BRT) project sponsored by the Greater Richmond Transit Company (GRTC) is to be located in Richmond, Virginia traversing in a primarily east-west direction along surface streets from Willow Lawn Avenue to Rocketts Landing using Broad Street, North 14th Street and East Main Street/Williamsburg Avenue/US Highway 60 and Wharf Street. The guideway would consist of dedicated median lanes and widened curb running segments with a total length of 7.6 miles. Dedicated bus lanes would be located in the median from Thompson Street to Adams Street and the curb lanes would be widened from 4th Street to 14th Street in downtown Richmond. The BRT alignment would include 14 stations (5 center, 3 consolidated and 6 curbside) providing direct transfers to 35 of 37 GRTC bus routes. The project would operate at least 7 BRT vehicles (which would need to be procured as part of the TIGER funding) in peak service with 3 spares on 10 minute headways in peak periods and 15 minute headways in off-peak periods. The hours of operation would be weekdays from 5:30 AM to 11:30 PM and weekends from 6 AM to 11:30 PM. Traffic Signal Prioritization will also be featured for higher average speeds and increased schedule reliability. Amenities such as passenger information displays will be located at each station. The BRT project will incorporate an off-board fare collection system. Furthermore, the vehicles and stations will be branded, providing a unique visual identification for the service.

2.2 Project's Schedule Summary (see Attachment B and TEAM or TrAMS):

A detailed project schedule is provided in Attachment B and FTA's Transportation Electronic Award and Management (TEAM) system or its successor, Transit Award and Management System (TrAMS). It reflects the best estimates of a complete project schedule showing all phases of work.

| | |
|---|---|
| Completion of NEPA: | April 10, 2014 |
| Planned Completion of Final Design: | June 21, 2016 |
| Planned Construction Start Date: | June 21, 2016 |
| Planned Revenue Service Date: | October 23, 2017 |

2.3 Project's Budget Summary (see Attachment C and TEAM or TrAMS):

A detailed project budget showing costs for all phases and elements of the project is provided in Attachment C and FTA's Transportation Electronic Award and Management (TEAM or TrAMS) system.

TIGER Grant Funds and Additional Sources of Project Funds:

| | |
|---|---|
| TIGER Discretionary Grant Amount: | $24,900,000 |
| Other Federal Funds (if any): | $0 |
| State Funds (if any): | $16,900,000 |

| | |
|---|---|
| Local Funds (if any): | $8,000,000 |
| Other Funds (if any): | $0 |
| Total Project Cost: | $49,800,000 |

If there are any cost savings, or if the contract award is under the engineer's estimate, the Recipient's funding amount and percentage share may be reduced, provided the Recipient's share of the costs under the Act may not be reduced below 20% for urban projects.

2.4 Project's State and Local Planning Requirements:

If applicable, the date that the project was included in the relevant State, metropolitan, or local planning documents is documented in FTA's Transportation Electronic Award and Management (TEAM or TrAMS) system.

2.5 Project's Environmental Approvals and Processes:

Environmental Approval Type: Environmental findings for each relevant activity are documented in FTA's TEAM system or TrAMS including the type of document (Record of Decision, Finding of No Significant Impact, or Categorical Exclusion) and dates, where required. Appropriate environmental documentation is attached to TEAM or TrAMS or on file at the appropriate FTA regional office.

2.6 Recipient's and any Sub- Recipient's Dun and Bradstreet Information:

Dun and Bradstreet Data Universal Numbering System (DUNS) No. of the Recipient: 07-474-6470

Name of any First-Tier Sub-Recipients (if applicable - to be reported if/when identified. If not applicable please note is N/A): N/A

DUNS No. of First-Tier Sub-Recipient (if applicable - to be reported if/when identified): N/A

2.7 Recipient's Designation of Official Contact (to whom all communications from Government will be addressed): **David L. Green**

Recipient Official Contact (may list more than one contact especially where another agency or department, in addition to Recipient, is assisting in meeting grant requirements):

**David L. Green**
**Chief Executive Officer**
**Greater Richmond Transit Company**
**301 East Belt Boulevard, Richmond, Virginia 23224**
**804-358-3871 ext. 366**
**dgreen@ridegrtc.com**

Notwithstanding paragraph 5.3 of this Grant Agreement, the Recipient may update the contact information listed in this paragraph by written notice (formal letter) to the Government without the need for a formal amendment to this Agreement.

## SECTION 3. REPORTING REQUIREMENTS

Subject to the Paperwork Reduction Act, and consistent with the purposes of the TIGER Discretionary Grant Program, Recipient agrees to collect data necessary to measure performance of the Project and to ensure accountability and transparency in Government spending. Recipient further agrees to submit periodic reports to the Government that contain data necessary to measure performance of the Project and to ensure accountability and transparency in Government spending.

3.1 **Project Outcomes and Performance Measurement Reports**: Recipient shall collect the data necessary to track and report on each of the performance measures identified in the Performance Measurement Table in Attachment D and report results of the data for each measure to the Government periodically, according the reporting schedule identified in Attachment D. Furthermore, Recipient agrees to provide an initial Pre-project Report and a final Project Outcomes Report to the Government.

3.1.1 The Pre-project Report shall consist of current baseline data for each of the performance measures specified in the Performance Measurement Table in Attachment D. The Pre-project Report shall include a detailed description of data sources, assumptions, variability, and the estimated level of precision for each measure. Recipient shall submit the report to the Government by **January 31, 2017**. Recipient shall represent that the data in the Pre-project Report is current as of **June 21, 2016**.

3.1.2 Recipient shall submit interim Project Performance Measurement Reports to the Government for each of the performance measures specified in the Performance Measurement Table in Attachment D following Project completion. Recipient shall submit reports at each of the intervals identified for the duration of the time period specified in the Performance Measurement Table in Attachment D. Recipient shall represent that the data in each of the interim Project Performance Reports is current as of the final date of the reporting interval.

3.1.3 The Project Outcomes Report shall consist of a narrative discussion detailing Project successes and/or the influence of external factors on Project expectations. Recipient shall submit the Project Outcomes Report to the Government by **March 31, 2024** which includes an *ex post* examination of project effectiveness in relation to the Pre-project Report baselines. Recipient shall represent that the data in the Project Outcomes Report is current as of **September 30, 2023**.

3.1.4 Recipient shall submit each report in accordance with paragraph 3.2.1 of this Agreement. The email shall reference and identify in the email subject line the TIGER Grant Number and provide the number of the Performance Measures report submitted, e.g., Re: FTA

FY2014 Tiger Grant No. 52 - Performance Measure Report No. 1 or 2 or 3, etc.

3.2 **Project Progress and Monitoring Reports**: Consistent with the purposes of the TIGER Discretionary Grant Program, to ensure accountability and transparency in Government spending, the Recipient shall submit quarterly progress reports and the Federal Financial Report (SF-425) in accordance with paragraph 3.2.1 of this Agreement or other system as designated by the Government, as set forth in Exhibit H, Quarterly Progress Reports: Format and Content, to the Government on a quarterly basis, beginning on the 20th of the first month of the calendar year quarter following the execution of the Agreement, and on the 20th of the first month of each calendar year quarter thereafter until completion of the Project. The initial report shall include a detailed description, and, where appropriate, drawings, of the items funded.

3.2.1 The Recipient shall submit all required reports and documents, referencing the Grant number, to the OST Contact designated by the Government in section 3.5 and in TEAM or TrAMS. If a submission is too large to attach to TEAM or TrAMS electronically, then it shall also be emailed to **TIGERgrants@dot.gov** and **theresa.garciacrews@dot.gov**.

3.3 **Annual Budget Review and Program Plan**: The Recipient shall submit an Annual Budget Review and Program Plan to the Government via e-mail sixty (60) days prior to the end of each Agreement year. The Annual Budget Review and Program Plan shall provide a detailed schedule of activities, estimate of specific performance objectives, include forecasted expenditures, and schedule of milestones for the upcoming Agreement year. If there are no proposed deviations from the Approved Detailed Project Budget, included in FTA's TEAM system or TrAMS, the Annual Budget Review shall contain a statement stating such. The Recipient will meet with the Government to discuss the Annual Budget Review and Program Plan. If there is an actual or projected project cost increase, the annual submittal should include a written plan for providing additional sources of funding to cover the project budget shortfall or supporting documentation of committed funds to cover the cost increase.

3.4 **Closeout Process**: Closeout occurs when all required project work and all administrative procedures described in2 C.F.R. 200 and DOT's implementing regulations at 2 C.F.R. 1201, as applicable are completed, and the Government notifies the Recipient and forwards the final Federal assistance payment, or when the Government acknowledges Recipient's remittance of the proper refund. Within ninety (90) days of the Project completion date or termination by the Government, the Recipient agrees to (1) submit a final Federal Financial Report (SF-425), a certification or summary of project expenses, and third-party audit reports; and (2) provide a report on the final scope of work, schedule, and budget compared against the scope of work described in section 2.1, the Project's Schedule Summary in section 2.2, and the Project's Budget Summary in section 2.3.

3.5 Unless otherwise provided herein, all notices or information required by this Agreement should be addressed and sent to all the Government contacts as follows:

**Official FTA Field Contact:**
**Terry Garcia Crews**
**Regional Administrator**
**Federal Transit Administration**
**United States Department of Transportation**
**1760 Market Street, Suite 500**
**Philadelphia, PA 19103-4124**
**215-656-7263**
**theresa.garciacrews@dot.gov**

and

**HQ FTA contact:**
**Samuel Snead**
**Transportation Data Analyst**
**Federal Transit Administration**
**Office of Program Management**
**United States Department of Transportation**
**1200 New Jersey Avenue, SE 4th Floor**
**Washington, DC 20590**
**202-366-1089**
**Samuel.Snead@dot.gov**

and

**OST contact:**

| | |
|---|---|
| **Name:** | OST TIGER Discretionary Grants Coordinator |
| **Agency:** | United States Department of Transportation<br>Office of the Secretary of Transportation |
| **Mailing Address:** | 1200 New Jersey Avenue, SE<br>Washington, DC 20590 |
| **Phone Number:** | 202-366-8914 |
| **Email Address:** | TIGERGrants@dot.gov |

Notwithstanding paragraph 5.3 of this Grant Agreement, the Government may update the contact information listed in this paragraph by written notice (formal letter) to the Recipient without the need for a formal amendment to this Agreement.

## SECTION 4. ADDITIONAL REQUIREMENTS

4.1 An acknowledgment of FTA support and a disclaimer must appear in any publication of any material, whether copyrighted or not, based on or developed under the Agreement, in the following terms:

"This material is based upon work supported by the FTA under Grant Agreement No.

VA-79-0001."

All materials must also contain the following:

"Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the Author(s) and do not necessarily reflect the view of FTA."

4.2 The Recipient has either executed the Federal Transit Administration's (FTA) Annual Certifications and Assurances for all FTA Federal assistance programs for which FTA awards Federal financial assistance in Federal fiscal year [2016] or has submitted the Certifications and Assurances in Exhibit D of this document. Such assurances are incorporated into this Agreement by reference and made a part hereof.

## SECTION 5. TERMINATION, EXPIRATION, AND MODIFICATION

5.1 Subject to terms set forth in this Agreement, the Government reserves, in its sole discretion, the right to terminate this Agreement and all of its obligations associated with this Agreement, unless otherwise agreed to in a signed writing between the Recipient and the Government, if any of the following occurs:

5.1.1 The Recipient fails to obtain or provide any non-TIGER Discretionary Grant contribution or alternatives approved by the Government as provided in this Agreement and in accordance with the Project Budget and Schedule included TEAM or TrAMS.

5.1.2 The Recipient fails to begin construction before December 31, 2016

5.1.3 The Recipient fails to begin expenditure of Grant funds by December 31, 2016

5.1.4 The Recipient fails to meet the conditions and obligations specified under this Agreement including, but not limited to, a material failure to comply with the Project Schedule in TEAM or TrAMS even if it is beyond the reasonable control of the Recipient; or

5.1.5 The Government, in its sole discretion, determines that termination of the Agreement is in the public interest.

5.2 Funds made available under this Agreement shall be obligated on or before September 30, 2016. Funds made available under this Agreement, once obligated, are available for liquidation and adjustment through September 30, 2021, the "Grant Termination Date." This Agreement, except with respect to the reporting requirements, shall terminate on the Grant Termination Date.

5.3 Either party (the Government or the Recipient) may seek to amend or modify this Agreement prior to the Grant Termination Date by written notice (formal letter) to the other party. The Agreement may be amended or modified only on the mutual written agreement by both parties. Changes to Attachments B and C (Estimated Project Schedule and Estimated Project Budget) do not require modification through the process in this paragraph if such modifications do not affect the dates or amounts in paragraphs 2.2 and 2.3, and the change has been consented to by the Government in writing consistent with FTA requirements (including by email).

## SECTION 6. AWARD AND EXECUTION OF GRANT AGREEMENT

A grant is awarded and executed by electronic signature in the FTA's electronic grants award and management system, TEAM or TrAMS. These electronic signatures legally bind the parties to the terms and conditions set forth herein, as well as those included in, referenced in, or attached in TEAM or TrAMS.

6.1 **Counterparts**: This Agreement may be executed in counterparts, which shall constitute one document. This Agreement shall be executed in triplicate; each countersigned original shall be treated as having identical legal effect.

6.2 **Effective Date**: The Agreement shall be effective when fully executed by authorized representatives of the Recipient and the Government; provided, however, that the Recipient shall execute this Agreement, and then submit three (3) original signed copies of the Agreement to the Government for execution. When this Agreement is fully executed and dated and TEAM or TrAMS is electronically signed and dated by the authorized official of the Government, these instruments will constitute an Award. Upon full Execution of these instruments by the Recipient, the effective date will be the date the Government awarded the funding through TEAM or TrAMS.

6.3 **Survival**: Notwithstanding anything to the contrary contained herein, the provisions of this Agreement relating to reporting requirements set forth in Section 3 of this Agreement shall survive the expiration or earlier termination of this Agreement.

## EXECUTION BY THE GOVERNMENT

Executed this 11th day of September, 2015.

Terry Garcia Crews
Signature of Government's Authorized Representative

Terry Garcia Crews
Name of Government's Authorized Representative

Regional Administrator
Title

## EXECUTION BY THE GRANTEE/RECIPIENT

By signature below, the Grantee/Recipient acknowledges that it accepts and agrees to be bound by this Agreement.

Executed this 14th day ~~of~~ September, 2015.

Signature of Recipient's Authorized Representative

David L. Green
Name of Recipient's Authorized Representative

Chief Executive Officer
Title

# ATTACHMENT A
# STATEMENT OF WORK

This description highlights any information in the TIGER discretionary grant application that needed to be updated or amended.

The Broad Street Bus Rapid Transit (BRT) project sponsored by the Greater Richmond Transit Company (GRTC) is to be located in Richmond, Virginia traversing in a primarily east-west direction along surface streets from Willow Lawn Avenue to Rocketts Landing using Broad Street, North 14th Street and East Main Street/Williamsburg Avenue/US Highway 60 and Wharf Street. The guideway would consist of dedicated median lanes and widened curb running segments with a total length of 7.6 miles. Dedicated bus lanes would be located in the median from Thompson Street to Adams Street and the curb lanes would be widened from 4th Street to 14th Street in downtown Richmond. The BRT alignment would include 14 stations (5 center, 3 consolidated and 6 curbside) providing direct transfers to 35 of 37 GRTC bus routes. The project would operate at least 7 BRT vehicles (which would need to be procured as part of the TIGER funding) in peak service with 3 spares on 10 minute headways in peak periods and 15 minute headways in off-peak periods. The hours of operation would be weekdays from 5:30 AM to 11:30 PM and weekends from 6 AM to 11:30 PM. Traffic Signal Prioritization will also be featured for higher average speeds and increased schedule reliability. Amenities such as passenger information displays will be located at each station. The BRT project will incorporate an off-board fare collection system. Furthermore, the vehicles and stations will be branded, providing a unique visual identification for the service.

# ATTACHMENT B
# ESTIMATED PROJECT SCHEDULE

A project schedule is also provided in FTA's Transportation Electronic Award and Management (TEAM) system.

| | |
|---|---|
| Completion of NEPA: | April 10, 2014 |
| Start of Right of Way Acquisition: | No Right-of-Way acquisition is planned |
| End of Right of Way Acquisition: | No Right-of-Way acquisition is planned |
| Design Consultant Selection Date | September 16, 2014 (Award) |
| Public Meeting | January 27 and 28, 2015 |
| Public Meeting | May 26 & 27, 2015 |
| Start of Preliminary Engineering | September 24, 2014 |
| End of Preliminary Engineering: | July 31, 2015 |
| Start of Final Design: | October 1, 2016 |
| Completion of Final Design: | June 21, 2016 |
| Construction Contract Award Date: | June 21, 2016 |
| Construction Start Date | June 21, 2016 |
| • Value Procurement Contracts | Start August 2016 End July 2017 |
| • Utilities Construction Package | Start August 2016 End July 2017 |
| • Signals & Systems Construction Package | Start September 2016 End July 2017 |
| • Stations Construction Package | Start October 2016 End July 2017 |
| • Roadway Construction Package(s) | Start October 2016 End July 2017 |
| Project Construction Substantial Completion | August 17, 2017 |
| Project Closure and Acceptance | September 15, 2017 |
| Revenue Service Date: | October 23, 2017 |
| Planned Project Closeout Date: | December 23, 2017 |

# ATTACHMENT C
# ESTIMATED PROJECT BUDGET

| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
|---|---|---|---|---|---|---|
| 11.71.11 – 3rd Party Contracts | Construction | 15,620,000 | 5,020,000 | 10,600,000 | 0 | 31,240,000 |
| 11.13.01 – Expansion 40-FT CNG Buses | Vehicle Purchase | 4,920,000 | 1,580,000 | 3,340,000 | 0 | 9,840,000 |
| 11.71.02 – 3rd Party Contracts | Final Design | 3,080,000 | 990,000 | 2,090,000 | 0 | 6,160,000 |
| 11.73.00 – Contingency | Contingency | 1,280,000 | 410,000 | 870,000 | 0 | 2,560,000 |
| | **Total** | 24,900,000 | 8,000,000 | 16,900,000 | 0 | 49,800,000 |

# ATTACHMENT D

# PERFORMANCE MEASUREMENT TABLE

**STUDY AREA:** CITY OF RICHMOND, VA (7.3 MILES) AND THE COUNTY OF HENRICO, VA (0.3 MILES) – THE BROAD STREET BRT PROJECT WILL COVER 7.6 ROUTE MILES AND PROVIDE SERVICE FROM WILLOW LAWN (IN WESTERN HENRICO COUNTY), THROUGH THE CITY OF RICHMOND'S BROAD STREET CORRIDOR AND CENTRAL BUSINESS DISTRICT, TO ROCKETTS LANDING (IN EASTERN HENRICO).

## Table 1: Performance Measurement Table

| Measure | Description of Measure | Measurement Period | Reporting Period |
|---|---|---|---|
| **Transit Service Levels** | A table that identifies the scheduled headways, vehicle miles, and vehicle-hours of service, by time of day, for a typical weekday, Saturday and Sunday, for each public transit route with stops in the study area before and after project opening. The table will be accompanied by a graphic that shows the alignment for each route. | **Baseline Measurement:**<br><br>**Accurate as of 6/21/2016**<br><br>**Interim Performance Measures:**<br><br>**Summarized quarterly: approximately 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, and 36 months after project opens for revenue operations.**<br><br>**Accurate as of 7/31 annually** | **Baseline Measurement:**<br><br>**1/31/2017 Interim Performance Measures:**<br><br>**Reported annually for a period of 3 years, beginning**<br><br>**3/31/2019** |
| **Travel Vehicle On-time Performance** | On-time performance will measure the timeliness of the route along the corridor in the study area. The On-time performance measured should be based upon the standards adopted by the transit agency. Alternatively, the default will be a 5 minute standard defined as departures from ninety percent (90%) of all timepoints within the study area and consisting of no greater deviation from the schedule than zero (0) minutes early departure and no more than five (5) minutes late departure. | **(Baseline) Measurement:**<br><br>**Accurate as of 6/21/2016**<br><br>**Interim Performance Measures:**<br><br>**Summarized quarterly: approximately 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, and 36 months after project opens for revenue operations.**<br><br>**Accurate as of 7/31 annually** | **Baseline Measurement:**<br><br>**1/31/2017**<br><br>**Interim Performance Measures:**<br><br>**Reported annually for a period of 3 years, beginning**<br><br>**3/31/2019** |

| Measure | Description of Measure | Measurement Period | Reporting Period |
|---|---|---|---|
| **Total Boardings & Alightings** | Directional boarding and alighting counts by stop for each transit trip with stops in the study area for a typical weekday, Saturday and Sunday. | **Baseline Measurement:**<br><br>**Accurate as of 6/21/2016**<br><br>**Interim Performance Measures:**<br><br>**Summarized quarterly: approximately 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, and 36 months after project opens for revenue operations.**<br><br>**Accurate as of 7/31 annually** | **Baseline Measurement:**<br><br>**1/31/2017**<br><br>**Interim Performance Measures:**<br>**Reported annually for a period of 3 years, beginning**<br><br>**3/31/2019** |
| **Transit Passenger Counts** | Daily Counts for the local GRTC transit routes operating in the study area. Counts should be for a typical weekday, Saturday, and Sunday within the study area. | **Baseline Measurement:**<br><br>**Accurate as of 6/21/2016**<br><br>**Interim Performance Measures:**<br><br>**Summarized quarterly: approximately 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, and 36 months after project opens for revenue operations.**<br><br>**Accurate as of 7/31 annually** | **Baseline Measurement:**<br><br>**1/31/2017**<br><br>**Interim Performance Measures:**<br><br>**Reported annually for a period of 3 years, beginning**<br><br>**3/31/2019** |
| **Development Intensity and Value in Project Area** | Annual total value and type of use for land parcels, (residential, commercial, mixed use, etc.) of properties within the project study area. | **Baseline Measurement:**<br><br>**Accurate as of 6/21/2016**<br><br>**Interim Performance) Measures:**<br><br>**Reported annually for a period of 3 years after project opens for revenue operations.**<br><br>**Accurate as of 7/31 annually** | **Baseline Measurement:**<br><br>**01/31/2017**<br><br>**Interim Performance Measures:**<br><br>**Reported annually for a period of 3 years, beginning**<br><br>**3/31/2019** |