

# CHAPTER 1

## Introduction

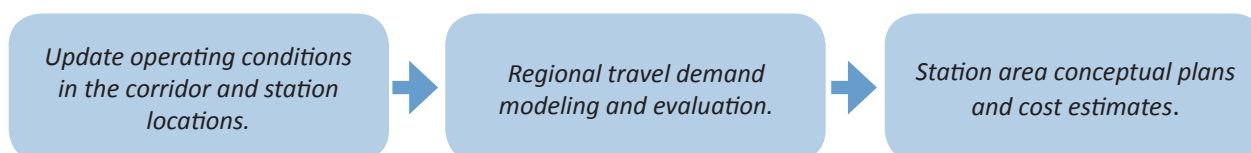
The I-95/I-395 Bus Rapid Transit Study (BRT) documents the potential for expanding bus transportation within the I-95/I-395 corridor, as well as along I-495 between Springfield and Tysons Corner. The purpose of this study is to refine recommendations that came from a previous I-95/I-395 Transit/Transportation Demand Management (TDM) Study by refining the market analysis conducted for BRT in the corridor and then by refining the station concepts. This current study recommends how a BRT system could operate in the corridor and recommends the steps needed to implement such a system.

The Transit Operators Committee (TOC) in coordination with the Virginia Department of Transportation (VDOT) through the Virginia MegaProjects team have sponsored this analysis in order to determine required infrastructure investments that would be needed to support BRT. Further analysis was needed to refine a preliminary Transit/TDM study for the I-95 and I-395 corridor from Massaponax, Virginia to Washington D.C. in February 2008. The Transit/TDM Study identified a Refined Alternative and Fiscally Constrained Refined Alternative that included a variety of improvements, as well as capital investments for creation of a BRT system with in-line transit stations and additional park and ride facilities throughout the corridor.

**The purpose of this study** is to conduct market analyses for the proposed BRT system in order to verify performance and to refine elements of the BRT system to be included in the overall development of the corridor. Specifically, this study provides:

- **Details** on the specific location and function of the proposed BRT stations along the corridor;
- **Market data** to be used in assessing the performance of the BRT system;
- **Conceptual designs** for the stations in order to determine how each station will function and be accessed;
- **Travel demand estimates** for various operating scenarios and for mode of arrival access at all station areas on the I-95 / I-395 corridor as well as for a proposed station in Tysons Corner;
- **Revised cost estimates** for the BRT system, stations and park and ride system.

The process focused on three primary stages – first, preliminary planning was conducted to update operating conditions in the corridor and to help physically locate and refine stations and station locations so that they could be modeled appropriately. Secondly, corridor-wide evaluations using the regional travel demand model were completed to determine overall effectiveness of the BRT system and various different operating scenarios for BRT in the corridor. Third, station area conceptual plans were developed to support the proposed BRT system.



This study focuses upon transit investments in the corridor and builds upon the initial findings presented in the Transit/TDM study. This study further explores and defines BRT concepts, emphasizing the evolution from BRT to a Priority Bus mode and the integration and phased implementation with current express bus operations.

## 1.1 Study Area Limits

This study encompasses an interstate highway corridor extending approximately 56 miles from the District of Columbia to the vicinity of Fredericksburg, Virginia. The corridor extent is defined by the overall I-95/I-395 HOV/Bus/HOT Lanes Project, which is developing the design and specifications for adding a third lane to the existing 28 miles of HOV Lanes between Arlington and Dumfries, VA and would build two new HOV lanes for an additional 28 miles south from Dumfries to Spotsylvania.

The extent of the study area is illustrated in **Exhibit 1-1**. Within this corridor, as proposed, the investment will result in improved transit access to key employment and activity centers, bus facilities to support service, and new park-and-ride spaces that will be added adjacent to major interchanges that support the BRT system. This current BRT Study includes the I-95/I-395 corridor, as well as the new HOV/HOT lanes under construction on the Capital Beltway (I-495), which presents the opportunity for a seamless connection for transit vehicles to access Tysons Corner, a major retail and employment destination.

As the major demand generator for commuter trips for the entire corridor, the current study area also includes a connection into the core of the District of Columbia across the 14th Street Bridge. Other adjacent origin and destination locations for trips within the corridor were also incorporated into the travel demand estimation for the various BRT scenarios. The prominent locations along the corridor consist of:

**Celebrate Virginia** – A proposed major new retail, entertainment and attractions destination located 39 miles south of the Capital Beltway, off I-95 exit 130 just south of the Rappahannock River in Fredericksburg.

**Town Center at Aquia** – Multi-use center planned for retail and housing in a pedestrian-friendly complex situated at the interchange of RT 610 and I-95 that is scheduled for completion in late 2011.

**Potomac Mills** - Large shopping mall and surrounding retail complex, located in Woodbridge, VA

**Lorton VRE Station** – Virginia Railway Express station located approximately 15 miles from downtown Washington D.C.

**Ft. Belvoir Main Post** – Major U.S. Army installation and origin/destination of trips within the northern segment of the study corridor. Located approximately 15 miles south of downtown Washington D.C. and 3 miles east of I-95. Approximately 20,000 jobs are anticipated to be transferred to Ft. Belvoir as a result of Base Realignment and Closure (BRAC).

**Engineer Proving Grounds** – New development to be constructed adjacent to the Fairfax County Parkway and I-95 interchange. A total of 12,900 jobs to be relocated to this site as a result of BRAC directed growth of Fort Belvoir.

### Activity Centers in BRT Corridor

- Celebrate Virginia
- Town Center at Aquia
- Potomac Mills
- Lorton VRE Station
- Ft. Belvoir Main Post
- Engineer Proving Grounds
- Franconia-Springfield Metro/VRE Station
- Mark Center
- Pentagon
- Tysons Corner

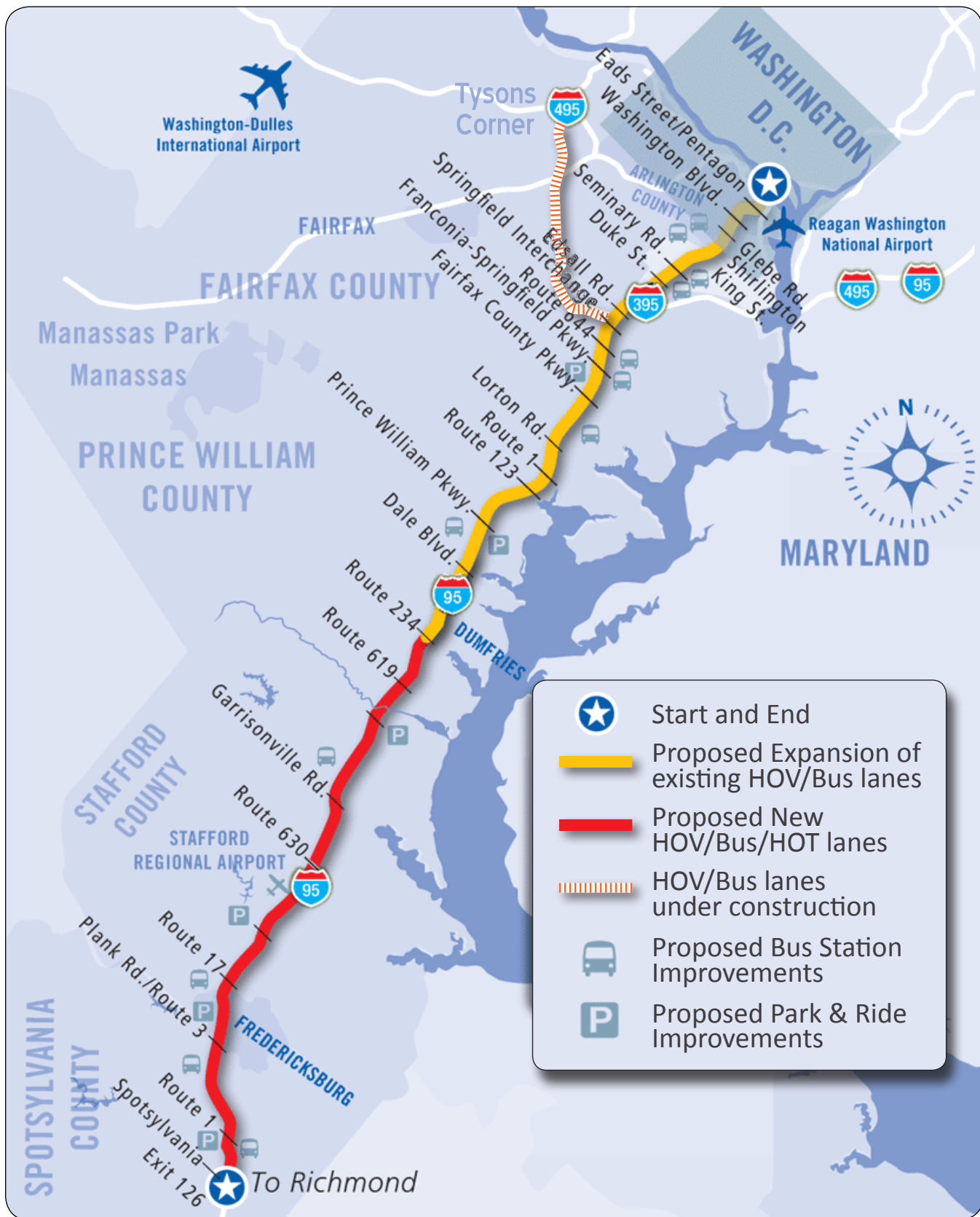


Exhibit 1-1 I-95/I-395 Study Corridor

**Franconia-Springfield Metro/VRE Station** – Major transit and intermodal facility located approximately 1 mile east of I-95 and 11 miles from downtown Washington D.C. This station location would serve as a major transfer location from BRT services to routes along the Capital Beltway, Metrorail, and other transit services.

**Mark Center** – Located in Alexandria, VA adjacent to the Seminary Road interchange with I-395. The Mark Center office complex is scheduled to receive 6,400 new jobs as a result of BRAC and plans include a new transit center located on-site.

**Pentagon** – Headquarters of the United States Department of Defense, located at the northern terminus of the I-95/I-395 HOV lanes in Arlington, VA. A major transit center is located adjacent to this facility, accessed from I-395 via Eads Street.

**Tysons Corner** – Edge city located between the community of McLean and the town of Vienna along the Capital Beltway, featuring CBD level employment center and a burgeoning residential mix. New Metrorail service (Silver Line) envisions several stations, including one at RT 123 (Tysons Central) which would be served by BRT routes along the Beltway.

In addition to these major destinations, the corridor provides access to some of the fastest growing suburban counties in the United States, consisting of Prince William, Stafford and Spotsylvania Counties. Proposed services would provide stations and additional park and ride facilities that would speed connectivity between these high-growth regions and the more established areas in Fairfax and Arlington Counties, as well as Alexandria and Washington, D.C.

## 1.2 Coordination Among Stakeholders

Extensive coordination was performed with the MegaProjects team assembled by VDOT to oversee facility design of the proposed I-95/I-395 HOT Lanes project and the Fluor-Transurban team proposing improvements under the Public-Private Transportation Act (PPTA) with the Virginia Department of Transportation. Additionally, a Transit Operators Committee (TOC) was convened to provide feedback on the study. Input from these meetings was essential in preparing the study.

There were a total of six meetings with the TOC, conducted both in person and via webcast (see acknowledgements for participating transit providers and agencies at the beginning of this report). As needed, one on one outreach to various jurisdictions and elected officials was conducted and their input incorporated as well.

## 1.3 Previous Recommendations

This report builds upon significant activity within the last 10 years to develop proposals and designs for improving operations and transit patronage in the I-95/I-395 corridor. Thus far, these efforts have culminated in the recommendations of the 2008 Transit/TDM Study and the results of the BRT market analysis contained herein.

The Transit/TDM Study detailed a Fiscally Constrained Recommendation for the corridor which included a variety of transit/TDM services and park and ride improvements. The total cost for the recommended improvements and investment strategy totaled \$298 million. As part of the Transit/TDM Study, a total of

### ***The Transit/TDM Study Fiscally Constrained Recommendation include:***

- *service modifications*
- *new services*
- *facility improvements*
- *enhanced and new TDM programs*

\$40 million of capital expenditure was included for four in-line BRT stations along the corridor. These stations were envisioned at major activity centers and recommended for placement within the median of the HOT lanes that are being studied in order to allow buses to stop with minimal delay. An in-line station was also to be constructed near the Lorton VRE station as part of the Fluor-Transurban proposal for implementing HOT lanes in the corridor that was also being considered at the time.

\$195 million from the HOT lanes project as a lump sum payment for transit
\$40 million in Federal (U.S DOT discretionary funding)
\$63 million in farebox recovery
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<b>\$298 million total.</b>

The Fiscally Constrained Recommendation documented in the Transit/TDM Study assumed reasonably available funding amounting to \$298 million. The funding for improvements would come from a combination of sources, consisting of (in 2010 dollars):

It was noted in the Transit/TDM study that the revenue dedicated to recommended improvements would be subject to final negotiation by VDOT and Fluor-Transurban as part of the HOT lanes project and allocation by the Commonwealth Transportation Board. In summary, the Fiscally Constrained Recommendation included service modifications, new services, facility improvements, and enhanced and new TDM programs. It recommended that \$137 million be spent on capital improvements and \$161 million for operating expenses over a period of 20 years.

## 1.4 Report Organization

This report provides:

- Clarity on the definition of BRT components used throughout the region and on corridor-specific considerations for their application
- Discussion of fatal flaws related to the construction or operation of BRT stations and supporting infrastructure
- Details on the specific location, features, and function of the proposed BRT stations along the corridor
- Conceptual designs are presented for stations and the parking facilities that directly support them in order to determine functionality
- Regional model ridership estimates for four (4) primary scenarios, capturing performance and operational data
- Revised cost estimates and an investment strategy for the BRT system and stations

The market analysis of this study determines whether or not the costs proposed for a BRT system and various bus enhancements result in sufficient benefits to justify the investment. The following sections of this report illustrate the approach used to establish a baseline for operating assumptions, the changes and future conditions to incorporate in sketch-level service design, and the potential for capturing a new market for transit service. The remaining sections of this report are organized by five topics:

**Corridor Conditions** – This section will profile the existing transit providers, services, and major transit destinations along the corridor. Changes in land-use and operating assumptions since the previous TDM study are identified and any fatal flaws for stations or infrastructure proposed are documented. Additionally, the opportunities for BRT along I-95/I-395 to be integrated into a vision for a larger set of BRT corridors throughout Northern Virginia is detailed.

**BRT Definition** – The flexibility of the BRT mode of transit often makes specific definitions vague. This section seeks to highlight the distinguishing features of a BRT system from existing express and local bus operations. This section also establishes common features and nomenclature which is to be consistent across other potential BRT projects being studied in Northern Virginia.

**Operating Scenarios** – This section builds upon the previous TDM study BRT routes and the new transit services outlined in the Constrained Long Range Plan (CLRP) for Northern Virginia. The resultant ridership is documented for several BRT scenarios that are layered into the mix of transit and tested through a regional travel demand model. Scenarios vary based on origin and destination pair, year of operation, and the location and ease of access to stations along the route.

**Analysis** – The integration of service with existing commuter operations, the market and fare structure of enhanced BRT services, and the cost estimation for the system and supporting infrastructure is presented. The phasing of operations and infrastructure is also presented, indicating what future triggers would warrant the larger investment in a BRT route or station.

**Recommendations** – This report concludes with the most promising and feasible BRT components and operating approach based upon the conclusions of this study. The recommendations reflect a refinement of the preliminary results of the TDM study and are intended to be incorporated into overall corridor investment decisions.