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## SUMMARY

The proposed Gainesville-Haymarket project would extend VRE commuter rail service for 11 miles between the City of Manassas and Haymarket, located in Prince William County, Virginia. The VRE extension would use an existing railroad right-of-way owned by Norfolk Southern Corp. that currently is used exclusively by freight trains. An extensive upgrade of the rail line would be required to make the line suitable for passenger service.

At this point in time, identifying a precise estimate of the capital costs to be funded from public sources would be misleading, because not all costs are known, and because the sharing of costs among various possible public and private sources will require agreements that have not yet been negotiated. However, initial conceptual plans for the extension have been prepared, and capital investment is expected to be in the range of \$174 to \$281 million dollars to make the necessary railroad infrastructure and rail yard facility improvements to support full VRE service to Haymarket, construct three new passenger stations and associated parking, and purchase additional VRE rolling stock to carry the new passengers that would be attracted to the system. The cost range is a wide one because no significant engineering work has yet been done, the quantity of required station parking cannot be precisely determined until more detailed ridership projections have been prepared, and the mix of surface and structured parking has not yet been determined. The cost could increase if engineering studies identify significant utilities to be relocated, if environmental analyses identify impacts that need to be mitigated, or if property must be purchased to widen the right-of-way in places. On the other hand, the costs to be borne by the public sector could be significantly reduced by proffers from station area developers and contributions from other private sector stakeholders. The project also could be implemented in phases, in order to manage cost. An initial interim phase providing limited VRE service to Gainesville could be implemented for between \$66 and \$109 million, perhaps shortening the implementation process by relying only on State, local and private funding.

The VRE extension project should not be considered as a stand-alone project. It affects, and is affected by, other VRE capital projects, highway construction and railroad grade separation projects in the corridor, and planning, zoning and development approval actions that need to be taken by Prince William County. The costs identified above are *in addition* to the funds that VRE will require to support anticipated growth in demand for rail service within its existing service territory – the costs of which have been identified in the VRE Strategic Plan, but for which full funding has not yet been obtained. The VRE extension project also may adjust the planned timing of highway projects to eliminate railroad grade crossings, or it may trigger new projects – requiring funding over and above what is currently budgeted.

The full project to extend VRE service 11 miles from Manassas to Haymarket will take an estimated nine years to complete, allowing for completion of the I-66/US 29 interchange and railroad grade-separation project. Phased implementation could realistically provide for initial service to Gainesville within a seven year time period. A



fast-track approach to implementing the project, with strong leadership, close coordination among project stakeholders and no significant delays, could result in completion of the first phase in approximately four years – however, this schedule is very optimistic. The following key project stakeholders, at a minimum, would need to reach a consensus and enter into a Memorandum of Understanding (MOU) with each other to enable the project to progress:

- Virginia Railway Express (VRE)
- Norfolk Southern (NS)
- Virginia Dept. of Rail and Public Transportation (VDRPT)
- Virginia Dept. of Transportation (VDOT)
- Prince William County (PWC)

The MOU would outline each party's roles, responsibilities and funding commitments. Other stakeholders also will need to be actively involved, including the City of Manassas (right-of-way and grade crossings within the City), CSX and Amtrak (who control the number of VRE trains that can operate into Washington, DC) and station area developers (who may choose to proffer station and rail infrastructure as part of their proposed development projects).

The VRE extension project presents an excellent opportunity for public-private partnership. NS will benefit from the rail infrastructure investments and has indicated a willingness to share in the funding of those projects. There are possible transit-oriented development projects at or associated with all three of the potential new VRE stations. Developers would receive the benefits of additional density and development flexibility in exchange for constructing the stations and parking facilities. All of the partners are potentially in place for a successful public-private partnership to implement the VRE extension, and land remains available to create a new passenger rail line, with attractive mixed-use employment centers and residential neighborhoods around the rail stations. The rail extension and station area development projects could be mutually beneficial and help Prince William County achieve its plans for managed growth. However, the window of opportunity for action may be short, given the intense development pressure in the corridor.

In the event a consensus is reached among the railroad stakeholders to proceed with the extension project, the next step in the process would be to obtain funding for engineering and environmental studies and commission an engineering feasibility study and analysis of environmental issues associated with the project. The following are recommended early action items:

- Secure funding for and conduct an engineering feasibility study, alternatives analysis and environmental review (VRE)
- Develop corridor land use and station area plans and/or development guidelines as a basis for ongoing rail line extension planning (PWC)
- Secure right-of-way and property for stations and railroad yard and shop facility (VRE and PWC)
- Formalize working arrangements among stakeholders (All).

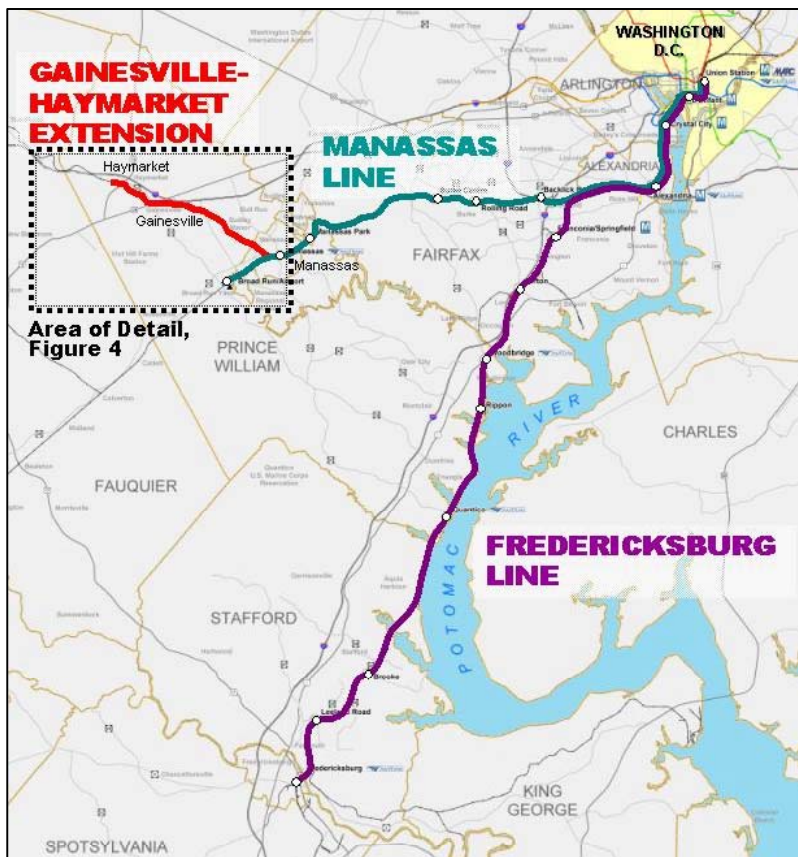
## BACKGROUND

### The Gainesville-Haymarket Extension Project

The Virginia Railway Express (VRE) operates commuter rail service in Northern Virginia on two lines, as shown in Figure 1: from Washington, DC to Fredericksburg on tracks owned by CSX, and from Washington to Manassas following a route owned by Norfolk Southern Corporation (NS).

The proposed Gainesville-Haymarket project would extend VRE service for 11 miles between Manassas and Haymarket, VA, over an existing railroad right-of-way owned by NS that currently is used exclusively by freight trains. The idea, while not new, has attracted significant local interest over the past several years as the greater Washington suburbs have reached outward into western Prince William County and the pace of residential and commercial development in the Interstate Route 66 Corridor has increased.

**Figure 1**  
**The VRE Network**





The Gainesville-Haymarket extension was one of several VRE network expansion options considered in the VRE long-range strategic plan and was projected to generate the largest increase in ridership of all the options analyzed. VRE and NS cooperated on the development of conceptual operating and infrastructure plans for the rail line, which led to the generation of estimated capital costs. These conceptual plans were documented in the Strategic Plan and incorporated into the recommended short to medium term investment plan.

Although funds have not yet been committed for ongoing planning and design, VRE and the Virginia Department of Rail and Public Transportation agreed that VRE would prepare this report to the General Assembly describing the project, estimating its cost, outlining the process by which the project can be implemented, and estimating the time required to plan, design and construct the rail extension.

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## Current Conditions

### Travel Conditions in I-66 Corridor

The primary transportation artery in the Gainesville-Haymarket corridor is Interstate 66, which is crowded today and is projected to remain congested even when currently planned widening projects are completed. Congestion on I-66 has expanded beyond the traditional rush hours and typically consumes much of the day. The continuing rapid growth in population and employment in the corridor, fueled by residential and commercial/industrial development, is stressing both I-66 and the state and local roads which feed it.

Direct transit service to Washington, DC and the major Northern Virginia business districts is not readily available in the corridor. The Potomac and Rappahannock Transportation Commission operates a connecting bus service during weekday rush hours to the West Falls Church Metrorail station from Gainesville, via Linton Hall Road and Devlin Road. Other than this single route, commuters to the central business district wishing to use transit generally must drive beyond the corridor – to the Metrorail station at Vienna or to the VRE stations at Broad Run or Manassas. Long drives, coupled with overcrowded Metro and VRE parking lots, discourage long-distance commuters from using transit.

High-occupancy vehicle (HOV) lanes will be extended to Gainesville on I-66, Prince William County has indicated its intention to sponsor a Metrorail connecting bus service starting in FY 2009, and Fauquier County also is seriously entertaining bus service sponsorship of its own, connecting to both VRE and Metrorail.

### Conditions on VRE

VRE has seen steady ridership growth over the past five years as the Northern Virginia suburbs have grown, traffic congestion has worsened, and the level of Federal transit fare subsidies has increased. The railroad now operates 32 daily trains and carries about 15,500 daily riders on a system that was originally designed 13 years ago for





10,000 riders. VRE has increased station parking, increased the size of its railcar fleet, converted the fleet to higher-capacity bi-level coaches, and is continuing to make investments in these areas to increase its capacity to keep up with rising demand. Even so, there are passengers on several peak period trains who cannot find a seat, and the parking lots at most stations fill up well before the end of the morning rush. VRE also is outgrowing the capacity of its train storage and maintenance facilities at Washington Terminal, which is triggering investment at the two outlying yards in Virginia – at Broad Run adjacent to the Manassas regional airport, and at the Crossroads industrial park in Spotsylvania County south of Fredericksburg.

Demand for VRE service is extending further and further away from Washington as suburban development continues to expand southward and westward of the current VRE service area. The two busiest VRE suburban stations are those at the ends of the two lines – Fredericksburg and Broad Run – where a significant percentage of riders drive to VRE from points well beyond the line.

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### **VRE's Overall Vision**

Since its founding in 1992, the vision of Virginia Railway Express (VRE) has been to provide safe, convenient, energy-efficient public transportation as a viable alternative to driving the congested highways from Northern Virginia to the business districts of Alexandria, Crystal City (Arlington), and Washington, DC. VRE's primary and best-performing market will be long-distance commuter travel to the Washington and Northern Virginia central business districts served by VRE, from areas beyond the reach of the Metrorail system.

By strategically extending the coverage of its network into the rapidly growing areas beyond Manassas and Fredericksburg, VRE will be able to increase its critical mass of ridership, which will permit VRE to improve the level of service offered to both its new and existing customers and provide a mobility option for travel to the central business district for a greater number of suburban residents. Extending and improving VRE service will make sense, if additional analyses demonstrate that VRE offers a level of service superior to what would be available by other modes and is cost-effective relative to other investment options such as expansion of highway capacity.

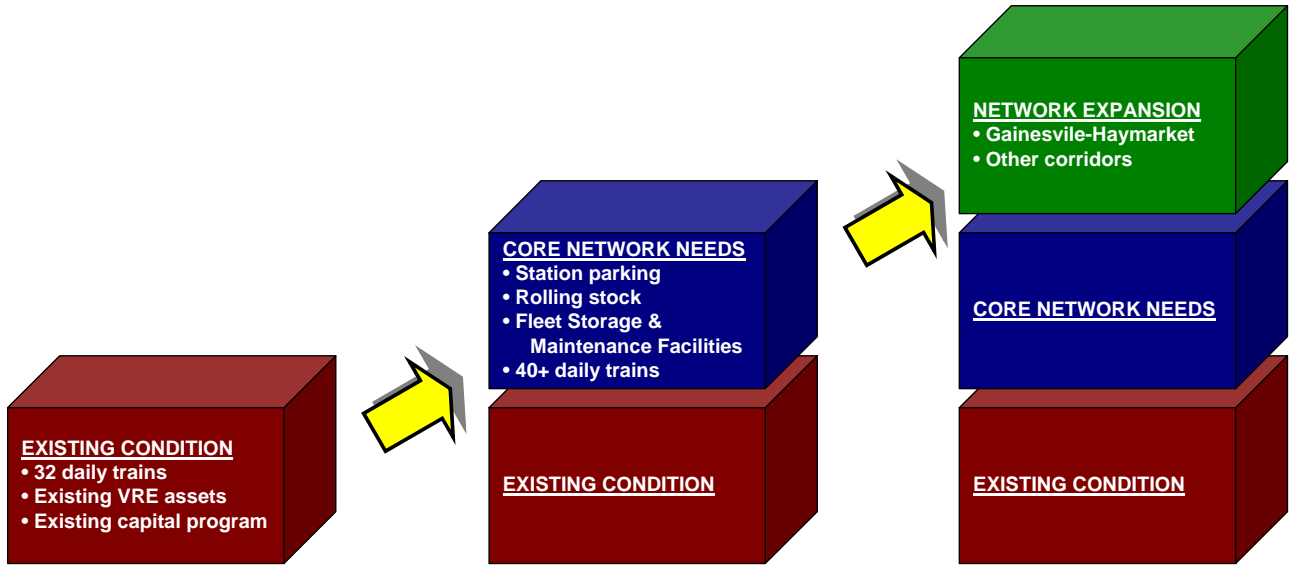
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### **VRE Capital Investment Priorities**

VRE is absolutely committed to offering high-quality commuter rail service to its existing customers in locations where it currently provides service. VRE's top priorities, therefore, are enhancing the reliability of service and increasing the capacity of its existing trains and station parking lots in response to growing demand.

VRE also recognizes that it can cost-effectively provide comparable, high-quality commuter service to areas of Northern Virginia beyond its current service territory. These are the areas where population and employment in the region are growing fastest. VRE's strategic plan recommends and plans for future expansion of the VRE Network, but only on top of a fully funded program to maintain and enhance the existing core network, as illustrated in Figure 2.

**Figure 2**  
**Building Blocks of the VRE Strategic Plan**



**THE CORRIDOR – VISION AND OPPORTUNITY**

**Residential and Employment Growth in the Corridor**

The Gainesville-Haymarket corridor is loosely defined as the portion of western Prince William County lying west of the City of Manassas, within three to five miles of Interstate 66 and the Norfolk Southern rail line. Over the past decade, this has been one of the fastest growing areas of Virginia. New communities and residential subdivisions are being created at a rapid pace, and new employment also is being generated at office, business and industrial parks within the corridor. Table 1 and Figure 3 show the historical and projected future pace of development and growth in the Gainesville-Haymarket Corridor.

Development within the corridor, especially residential development, is occurring at a faster pace than expected. Therefore, a relatively short window of time exists where investments in transportation can be made while developable land is relatively plentiful, as development is still occurring, and where the form and patterns of development can be influenced by and made responsive to those transportation investments.

Population growth was 3.7 percent per year between 1990 and 2000. In the period between 2000 and 2005, the corridor has seen population grow by an average of 12.4 percent per year. From now through 2015, the County projects the growth to continue at a rate of approximately 5 percent per year. After 2015, growth is expected to taper to





just over 1 percent per year. Employment growth has been and is expected to remain steady through 2015 – in the range of 4 to 5 percent per year.

**Table 1**  
**Historical and Projected Population and Employment Growth in the Gainesville-Haymarket Corridor and Prince William County**

Gainesville-Haymarket Corridor (Prince William County Development Area North of Route 28)

	1990	2000	2005	2015	% Increase from 2005	2030	% Increase from 2005
<b>Population</b>	31,103	44,567	79,860	125,615	157%	149,806	188%
<b>Employment</b>	15,915	25,206	30,411	49,325	162%	70,138	231%

Total -- Prince William County

	1990	2000	2005	2015	% Increase from 2005	2030	% Increase from 2005
<b>Population</b>	215,686	280,813	352,063	463,198	132%	536,994	153%
<b>Employment</b>	65,742	91,628	100,525	138,466	138%	186,030	185%

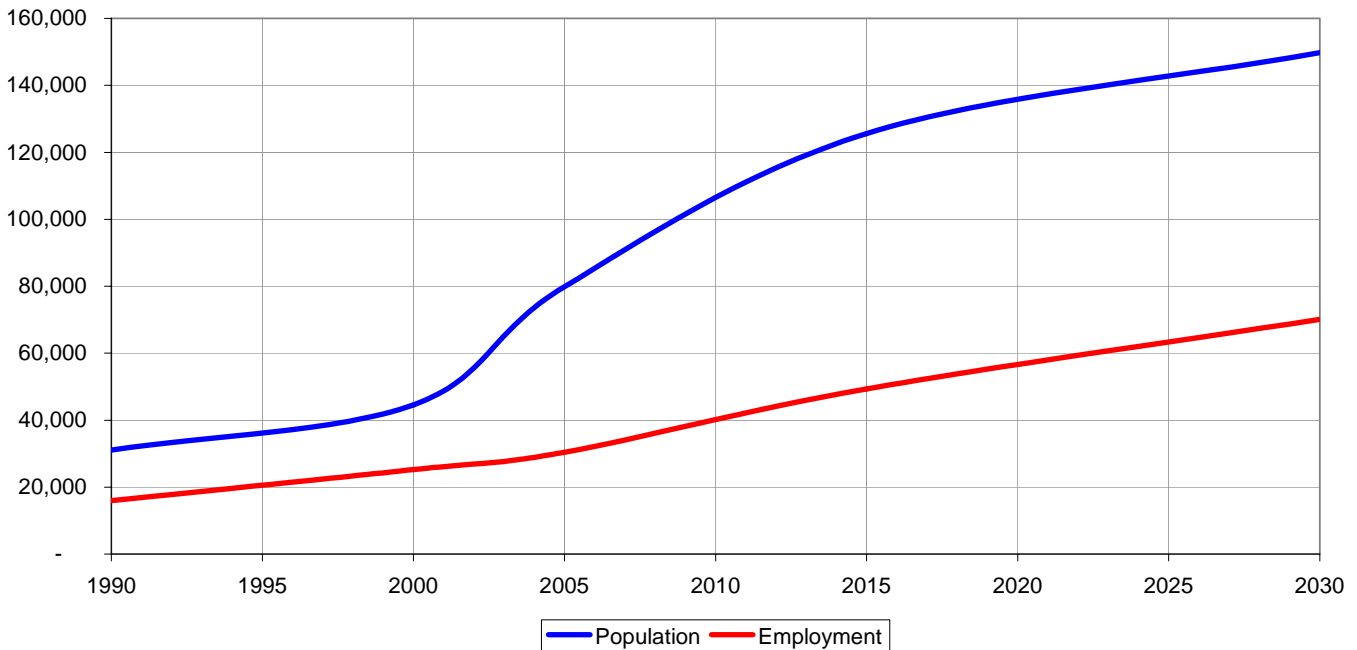
Source: Prince William County

1990 population based on 1990 census. 1990 employment is an estimated number prepared as a part of MWCOG Round 5.4.

2000 population based on 2000 census. 2000 employment is an estimated number prepared as a part of MWCOG Round 6.4.

2005, 2015 and 2030 forecasts from MWCOG Round 7.0 Version III, as provided to COG by Prince William County

**Figure 3**  
**Population and Employment Growth in the Gainesville-Haymarket Corridor**



Source: Prince William County. Corridor defined to be the county's development area north of State Route 28.





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### **VRE Rail Service in the Corridor**

The VRE Strategic Plan envisions the future Manassas Line having two branches that diverge at Manassas: the existing service to Broad Run, which may be extended in the future into Fauquier County, and a new branch line to Gainesville and Haymarket. Three new stations would be built on the Gainesville-Haymarket branch, with peak period trains to Washington at 30-minute intervals. Some peak trains would be able to operate as express trains or skip certain stops east of Manassas, improving running times and helping to make VRE even more time-competitive with the automobile. The companion service could be a “turn train” that would enable passengers boarding at the existing closer-in stations to more easily get a seat.

In the long term, as demand builds and as VRE is able to make the necessary investments in railroad capacity, VRE envisions providing reverse-peak service on the Gainesville-Haymarket branch to workplaces in the corridor for inner suburban and city residents, as well as off-peak and weekend service, which would open up the service and stations to users other than commuters. The long-term vision is for bi-directional service throughout the day at hourly or bi-hourly intervals, perhaps provided by a combination of trains and buses.

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### **Transit Service in the I-66 Corridor**

With the VRE Extension in place and the HOV lanes on I-66 extended to the Gainesville-Haymarket area within the next decade, western Prince William County would be equipped with two major public transportation facilities for serving long-distance commute trips to the Washington central business district as well as other significant business districts and employment concentrations in Northern Virginia:

- VRE rail service from Haymarket and Gainesville via Manassas to Alexandria, Crystal City and Washington, DC
- HOV lanes along I-66 extended to Gainesville and Haymarket, providing capacity for convenient express bus service and carpools.

A combination of VRE rail service and express bus service could provide commuters in the corridor with a rich array of public transportation choices. VRE logically could become the preferred mode of transport to the VRE-served central business districts and to Reagan National Airport, and VRE also could become a useful provider of reverse commute and other service to employment and activity centers in the I-66 corridor. Express bus via the I-66 HOV lanes could become the preferred mode of transport to other regional employment concentrations, such as Tyson’s Corner, the Dulles Toll Road corridor, and Dulles International Airport.

Extension of the Metrorail Orange Line to Centreville remains in the region’s long-range transportation plan. A future alternatives analysis will be needed to weigh the relative merits, impacts, costs and implementation timeframes of VRE extension, Metrorail extension and other transportation options in the corridor.



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### **Transit-Oriented Development Opportunities**

Each of the three new stations envisioned for VRE on the Gainesville-Haymarket branch could be developed in one of two ways:

- As traditional commuter rail park-and-ride stations, with large parking lots easily accessed from the local roadway network; or
- As part of transit-oriented development (TOD) projects, which would create new town centers with the train stations as their focal points, providing increased residential and commercial development densities close to the stations and lower densities further away, and also providing structured parking for park-and-ride commuters.

The latter approach would maximize VRE ridership potential by concentrating workplaces and homes in close proximity to the rail stations and would enable the capital costs of station and parking facilities to be borne largely by private developers. The former approach offers a feasible option in the event that developers, the County, and the various railroad stakeholders are unable to reach agreement on specific transit-oriented development projects.

At potential stations situated in close proximity to I-66, the possibility exists to develop these stations as multi-modal transportation centers, providing VRE rail service to Alexandria, Crystal City and downtown Washington, DC, as well as express bus service to other major Northern Virginia business districts such as Tyson's Corner, Reston and Herndon. The multi-modal transportation centers could be designed to have relatively convenient bus access to I-66. Express buses could utilize the I-66 HOV lanes, which are planned to be extended to the Gainesville-Haymarket corridor as I-66 is widened.

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### **Public-Private Partnerships – A Key Element of the Vision**

The Gainesville-Haymarket extension will not be able to be implemented by VRE on its own. The project is envisioned as a public-private partnership, with multiple beneficiaries all contributing to the funding and implementation of the project.

Developers of transit-oriented development (TOD) projects at the VRE stations could potentially bear all or a major share of the cost of constructing station facilities, parking structures and access roads. Property owners along the right-of-way could agree to sell or contribute property to widen or shift the railroad right-of-way, receiving the benefits of increased property values as accessibility and quality of life improves as a result of improved rail service in the corridor. When VRE reverse-commute service becomes a reality, as investments in railroad capacity are made and operating agreements with both CSX and Norfolk Southern are modified to allow for increased train service, major employers in the corridor could operate or financially support local shuttle bus services between VRE stations and workplaces in the corridor, with service coordinated with VRE train schedules.



Prince William County would take the lead in selecting the sites for the stations and deciding whether or not to link station development with adjacent land development. If TOD projects are pursued, Prince William would provide the necessary zoning changes and development plan approvals to permit the projects to proceed. The County and State would construct the roadways needed to provide direct access to the stations, using a combination of public and developer-provided funding.

VRE would coordinate investment from the Federal, and State and local government levels – in rail infrastructure, rolling stock and train storage and maintenance facilities. Public capital investment in upgrading the Norfolk Southern branch line between Manassas and Haymarket rail line will leverage investment by Norfolk Southern elsewhere in its network to create a more seamless, high-capacity north-south freight mainline through Virginia.

The resulting cooperative effort among multiple stakeholders would represent a true public-private partnership and could conceivably be a model for this type of development in other urban regions. As such, it could more easily attract Federal funding and potentially would be a strong candidate for funding by the Commonwealth of Virginia as part of the newly created Rail Enhancement Fund.

## THE PLAN

The VRE Gainesville-Haymarket Extension will include upgrading 11 miles of the Norfolk Southern ‘B’ Line to make it suitable for the introduction of passenger service and to enable growth in freight traffic. In the full build-out, three new VRE stations would be built, along with a rail yard for the overnight storage, servicing and maintenance of VRE trains. Figure 4 illustrates the planned improvements between Manassas and Haymarket, where most of the required capital investments would be concentrated.

Several variables which need to be considered in the evaluation of the Gainesville-Haymarket extension are discussed in the following sections.

### The Rail Line

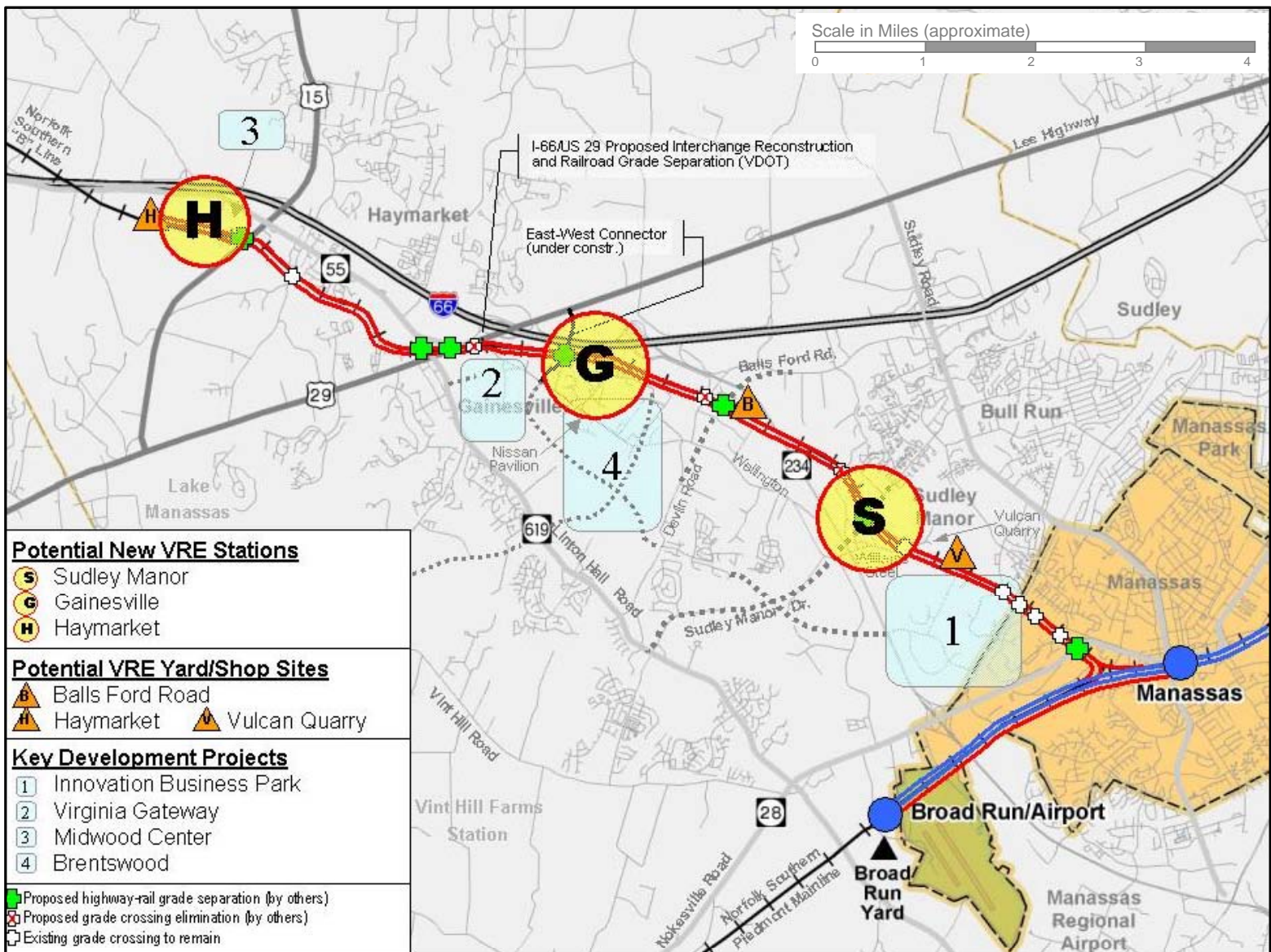
The railroad between Manassas and Haymarket was built in 1854 as a minor branch line to serve the local industries and farms in the Shenandoah Valley. It was never intended for passenger traffic or dense mainline freight operations. The ‘B’ Line, as it is known today, has only a single track and has multiple curves and a maximum speed limit of 45 mph. As a result of railroad mergers and the increasing difficulty of moving freight trains through Washington and on Amtrak’s Northeast Corridor, Norfolk Southern now operates most of its north-south through freight trains via the ‘B’ Line.

The present physical characteristics of the rail line pose four significant obstacles to expansion of freight service and the introduction of passenger service:

1. The line is single track, which severely restricts the capacity of the line

2. The line is unsignalled or “dark,” which restricts both speed and capacity and effectively precludes the safe commingling of freight and passenger trains
3. The line is slow speed, with a maximum authorized speed of 45 mph and slower speed limits at locations with sharp curves
4. There are 15 at-grade roadway crossings between Manassas and Haymarket, which increase exposure for grade crossing accidents as train movements increase. The most problematic of these are the sharply skewed crossing of US Route 29 at Gainesville and the crossing of Nokesville Road (State Route 28) west of Manassas, both of which are proposed for elimination but not yet fully funded.

**Figure 4**  
**Schematic Plan of VRE Gainesville-Haymarket Extension**







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## **Planned Development Along the Rail Line**

Four major development proposals – in various stages of the planning, approval and implementation process – are significant in terms of their potential relationship to VRE stations. Three significant development projects have been approved:

- Innovation at Prince William Business Park (office and technology-related employment, as well as a campus of George Mason University)
- Virginia Gateway (mixed use development along US Route 29 and Linton Hall and Wellington Roads at Gainesville)
- Midwood Center (light industrial development along State Route 55 west of Haymarket).

As of 2005, the first two projects have been partially built out, though considerable developable land remains. Construction has not yet started on the Midwood Center project.

The fourth project, known as Brentwood, is proposed as a large mixed use development east of Gainesville along Wellington Road and is in the midst of the County development review and approval process at the time of the writing of this report.

The locations of these projects encompassing or adjacent to potential VRE station sites are indicated in Figure 4, which also shows several new roadways and selected roadway widening or relocation projects that are planned for the corridor. Many of these roadways would provide access to and from the VRE stations.

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## **Stations**

Of VRE's 18 existing stations, 13 were built specifically for VRE and reflect a "no frills" approach to the operation. Each of these stations has a single low-level platform, a simple canopy and shelter, and a surface parking lot or parking garage. The three proposed stations along the Gainesville-Haymarket extension must at least meet VRE's minimum standards for stations, which are more substantial than the standards to which VRE's original stations were built, because VRE now carries about 50 percent more riders than were envisioned at its inception. If constructed as part of comprehensive transit-oriented development (TOD) projects, serving express bus routes as well as VRE, the stations will likely offer more facilities and greater amenities for passengers.

The additional capacity will comprise longer platforms and platforms on multiple tracks, with ADA-compliant pedestrian bridge or underpass crossings. Longer platforms (a minimum of 600 feet to accommodate an 8-car train) are required to accommodate planned increases in the length of VRE trains. Multiple platforms are required to preserve operational flexibility on the railroad for passenger and freight traffic and to facilitate reverse-commute service. Additional station amenities, such as a station building and retail concessions, would be built at the discretion of Prince William County and the station area developers.



The spacing of stations along the line involves a tradeoff: more convenient local access with a greater number of stations versus improved travel time and average speed with fewer stations. Each additional station stop can add about two minutes of run time. Typically, commuter rail systems have stations that are spaced between two and four miles apart. In the case of the 11-mile branch from Manassas to Haymarket, three is the right number of stations to conveniently serve the population and employment in the area without unduly affecting average operating speeds.

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### **Sudley Manor Area**

Sudley Manor Drive is expected to be extended across the rail line and offers an excellent opportunity for a VRE station. Sudley Manor Drive is an important arterial roadway, serving several established residential neighborhoods north and west of Manassas. Prince William County is planning to extend the road to the south and west to serve the heart of the rapidly developing residential district along Linton Hall Road and University Boulevard. The roadway extension will cross the railroad on a bridge and intersect with the Prince William Parkway (SR 234), a major regional highway. This location also is at the northern end of the Innovation Business Park, which has just developed a master plan for considerable growth.

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### **Gainesville Area**

Gainesville is in the heart of the rapidly developing west side of Prince William County. In the County's land use plan, Gainesville is a designated growth center and urban node. The center of Gainesville near the intersections of US 29, SR 55 and Linton Hall Road is being redeveloped for intensive retail uses, including big box stores and a new shopping "main street" within a mixed use larger development known as Virginia Gateway. Large residential subdivision projects surrounding the Gainesville core area currently are proceeding or are in the planning and development review stage.

Much of the park-and-ride demand for VRE service at the Gainesville station will come from the rapidly developing residential subdivisions along US 29, Linton Hall Road, University Boulevard, and Devlin Road. The East-West connector roadway, now under construction, will provide convenient access to the rail line corridor from US 29 east of the I-66 interchange. The station will require a large parking lot or parking structure, as well as convenient access from the arterial roadway network.

The station could be developed either in the traditional way, with a large adjacent parking lot, or it could be developed as the focal point of a transit-oriented development, with relatively dense mixed-use development within walking distance of the station and with a multi-level parking structure to serve park-and-ride patrons.

The Nissan Pavilion is located within one mile of both potential Gainesville station locations. The opportunity exists for VRE to carry a share of the spectators attending concerts at the Pavilion. Further analysis will be required to determine whether such service can be provided cost-effectively.

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### **Haymarket Area**

Haymarket is the logical end of the line for VRE service. Immediately west of Haymarket lies the Rural Crescent of Prince William County, an area where the County's long-range plan and zoning prohibit dense development, and where the County is focused on







protection of the environment and existing agricultural uses. The railroad as it ascends westward from Haymarket into Fauquier County and the Appalachian foothills becomes significantly more slow and circuitous, and travelers to Washington from towns to the west would find it more convenient and fast to drive to Haymarket versus using a train station closer to home.

Haymarket is situated where I-66 crosses US Route 15 and has excellent regional highway access. This will be the location that captures commuters from residential developments along the western edge of Prince William County's development zone, as well as from the north, west and southwest.

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## **VRE Train Service and Ridership**

### **Train Service**

In its first phase of implementation, VRE service on the Gainesville-Haymarket branch is envisioned as three weekday round trips, inbound towards Washington in the morning and outbound from Washington in the evening. The trains would operate in the peak periods, at approximately 50-minute intervals.

As warranted by demand, the service would expand by increasing the number of trainsets operated, decreasing peak headways, and introducing reverse-peak and off-peak trains. The ultimate goal would be a full commuter service on the Haymarket branch, with peak period trains operating at thirty-minute intervals.

Norfolk Southern will operate freight trains on the line interspersed with VRE passenger trains. During peak periods, VRE trains typically would operate on one of the two main tracks while NS trains would use the other track. The frequency of NS freight traffic is expected to increase over time, from the current level of approximately 16 daily trains.

Running time on the branch for VRE trains would be approximately 18 minutes from Gainesville to Manassas and 23 minutes from Haymarket to Manassas. The total travel time from Gainesville to Union Station, Washington, DC would be approximately 90 minutes. The trip from Haymarket would be approximately five minutes longer.

### **Ridership Potential**

Detailed travel demand modeling has not yet been undertaken for the extension of VRE service in the Gainesville-Haymarket corridor. This would be done as part of a subsequent feasibility study and environmental analysis. The rail market assessment performed by VRE in 2003 during the development of its Strategic Plan indicated the potential for 3,100 to 5,500 incremental daily trips by 2025 as a result of the extension project. Prince William County has indicated that residential development and population growth in the corridor is happening faster than had been previously projected. As a result, this level of ridership could be reached sooner than projected, perhaps within the 2015 timeframe, soon after the project is completed. Large-scale transit-oriented development, which is planned or is possible at each of the three stations proposed for the extension, could result in higher levels of utilization of the railroad.

Ridership on the VRE extension will be composed of the following trip types:



- Core commute trips to the Central Business District, VRE's traditional base of ridership
  - New trips generated by new development within the corridor, including trips that are made very convenient through transit-oriented development
  - New VRE trips by existing commuters who currently drive or use other modes of public transportation
  - Existing VRE trips diverted from other stations (i.e., Broad Run and Manassas) because of improved accessibility and parking availability at new stations in the Gainesville-Haymarket corridor.

Other types of trips not presently served by VRE also could be accommodated in the future:

- Reverse commute trips from Washington, DC, Arlington and Alexandria to workplaces in the Gainesville-Haymarket corridor – a market that could be served with increased reverse-direction VRE service in the long term
  - Walk access to workplaces within walking distance of VRE stations
  - Bus service to office parks and workplaces from VRE stations
- Off-peak and weekend trips, if and when VRE service is expanded from its current rush hour focus (also longer term)
- Special event trips, including those generated by the Nissan Pavilion.

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## **Required Capital Investment**

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### **Rail Infrastructure and Facility Requirements**

As it stands now, the Norfolk Southern's 'B' Line is not suitable for passenger service. As part of the VRE Strategic Plan, the Woodside Consulting Group identified a number of capital improvements necessary to upgrade the line for passenger service and permit continued unrestricted use of the line by freight trains. Capital upgrades to rail infrastructure on the Norfolk Southern 'B' Line that are necessary for the extension of passenger service include:

- Double tracking of the existing single-track line for 11 miles
- Widening the railroad right-of-way as necessary and appropriate to accommodate three main tracks, including the second main track planned as part of this project, as well as potential future expansion
- Installation of signals and centralized traffic control
- Special electronics and circuitry for highway warning devices at grade crossings
- Upgrading the speed limit, where conditions allow, from 45 mph to 60 mph for freight trains, and to 79 mph for passenger trains, which may involve realignment of the railroad at certain locations



- Upgrading the track connections between rail lines at Manassas, to permit improved allowable speeds (up to 30 mph)
- Other required capacity investments on Norfolk Southern right-of-way to facilitate increased passenger and freight operations, including additional siding capacity between Manassas and Alexandria and between Haymarket and Front Royal.
- VRE train storage and fleet maintenance facilities.

VRE will require land adjacent to the right-of-way for a train storage yard capable of storing the six VRE trainsets that are projected to be used in service on the branch, as well as a shop facility at which VRE can perform various maintenance functions and periodic locomotive and coach inspections that are required by the Federal Railroad Administration.

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### Capital Projects and Estimated Costs

Table 2 provides a summary listing of the capital projects required to implement the proposed VRE extension, with estimated capital costs, inflated to the assumed midpoint of construction. Recognizing that plans for the extension exist only at a conceptual level, and that engineering studies and environmental analyses have not yet been undertaken, a range of costs is provided. The costs include a contingency and allowances for design, construction management, and project administration. The cost estimates should be considered a general guideline for planning purposes and are subject to change during the planning and design process.

Investments are shown in two phases of implementation. The first phase would provide service as far as Gainesville, but not all the way to Haymarket. The second phase would extend VRE service to Haymarket. The first phase, covering approximately 8 route-miles, can be constructed as soon as funding and approvals are in place. The second phase would extend the line by approximately 3 route-miles and would be timed to open when the State-sponsored project to reconstruct the I-66/US 29 interchange and grade separate the highway and railroad at Gainesville is completed.

Table 2 also shows two potential options for the initial Phase 1 project to Gainesville:

- Option 1 – Limited initial capital investment in railroad infrastructure and station facilities, with a single new station at Gainesville, initial VRE service limited to 3 weekday peak round trips to minimize operational impacts on NS freight service (i.e., 3 morning peak VRE trains to Washington spaced 50-60 minutes apart, with 3 returning trips at similar intervals in the evening), and implementation on a fast-track schedule, presumably without Federal funding and the attendant Federal review and approval process.
- Option 2 – Initial capital investment sufficient to support full VRE service to Gainesville, permitting peak VRE service at 30-minute intervals, with new stations at both Sudley Manor and Gainesville, and implementation using a combination of Federal, State, local and private funding sources, following the Federal Transit Administration’s New Starts process.



The first option offers the best opportunity for fast-track implementation, provided sufficient funds can be obtained from non-Federal public and private sources. However, continuing growth in ridership demand would likely trigger the need for a second set of capital projects – to provide capacity to enable VRE service to grow beyond the initial level. The second option would provide VRE and NS with more up-front flexibility in designing and operating their respective services and responding to passenger and freight market demand, but the higher initial cost would likely necessitate Federal funding participation and result in a more complicated and lengthy implementation process.

The final two columns of costs in Table 2 show the range of known capital costs to implement both Phases 1 and 2 combined, enabling full VRE service to Haymarket, with VRE trains operating at 30-minute intervals during the weekday peak periods. The capital project list for the combined Phases 1 and 2 includes the rail infrastructure projects cited above, plus the three planned stations at Sudley Manor, Gainesville and Haymarket, the additional rolling stock that VRE will need to operate the proposed service, and a train storage yard required for Gainesville-Haymarket branch line service.

Of the 15 existing roadway grade crossings of the line, six are planned for roadway grade separations by either VDOT or Prince William County. These projects would eliminate the crossings, but none of the projects are currently fully funded. Since grade crossing eliminations typically are implemented by departments of transportation using highway funding, the estimated cost of these projects is not included in the table below. The remaining nine grade crossings would receive upgraded crossing protection. All but two of these are driveways or minor local roads.

Of the six VRE trainsets that would serve the branch, three new sets would be required to serve the incremental ridership demand generated by the extension project. The other three sets would be taken from VRE's regular pool of equipment. Each trainset is assumed to comprise a diesel locomotive and six passenger coaches. One of the coaches would be a cab control car, enabling "push-pull" operation of the train in either direction – similar to VRE's existing trains. The total incremental fleet requirement is estimated to be three locomotives and 18 coaches.

These projects to implement Gainesville-Haymarket service are in addition to the program of investments in the VRE core network that is necessary to keep the system operating at a high level of service and reliability, while providing additional capacity as ridership at existing VRE stations continues to grow. Core network investments by 2015 will need to include parking expansion and platform lengthening at existing suburban stations, new bi-level coaches and locomotives, and increased train storage capacity and improved train servicing facilities at Washington, DC and the existing VRE outlying yards. These core network needs will require approximately \$550 million in capital investment through 2015, in the range of \$50 to \$60 million annually. Though VRE is proceeding to implement its Strategic Plan, current annual funding remains well below this level, and the core network projects are not yet fully funded.

In addition, a continuing program of rail infrastructure investments on the CSX line between Washington and Fredericksburg, targeted at increasing capacity, will be necessary to ensure that VRE will be able to continue increasing the number of commuter trains operated as demand continues to grow.

**Table 2**  
**Estimated Capital Costs –**  
**VRE Gainesville-Haymarket Extension**

Cost Category	Phase 1 Manassas-Gainesville Option 1 - Limited Service		Phase 1 Manassas-Gainesville Option 2 - Full Service		Phases 1+2 (cumulative) Manassas-Haymarket Full Service	
	Low End of Range	High End of Range	Low End of Range	High End of Range	Low End of Range	High End of Range
Rail Infrastructure	\$ 44.5	\$ 78.5	\$ 75.5	\$ 85.2	\$ 99.2	\$ 117.5
Train Storage & Maintenance Facilities	\$ -	\$ -	\$ 10.0	\$ 15.0	\$ 10.0	\$ 15.0
Station Facilities	\$ 6.3	\$ 8.0	\$ 13.1	\$ 16.1	\$ 16.9	\$ 20.9
Station Parking	\$ 15.0	\$ 22.5	\$ 19.9	\$ 59.8	\$ 22.4	\$ 89.7
Rolling Stock	\$ -	\$ -	\$ 25.0	\$ 37.5	\$ 25.0	\$ 37.5
<b>TOTAL COST BY PHASE</b>	<b>\$ 65.8</b>	<b>\$ 109.0</b>	<b>\$ 143.6</b>	<b>\$ 213.6</b>	<b>\$ 173.5</b>	<b>\$ 280.6</b>
Track-miles of additional main track					\$ 14.9	\$ 18.4
Total cost per mile					\$ 11.6	\$ 15.2
Total rail infrastructure cost per mile					\$ 11.7	\$ 11.0

**Notes:**

- <sup>1</sup> Costs expressed in millions of dollars; costs include allowance for inflation to estimated midpoint of construction (2010 for Phase 1, 2011 for Phase 2) at 5% per annum.
- <sup>2</sup> VRE rolling stock and storage yard costs assumed to be incurred in Phase 1.
- <sup>3</sup> Rail infrastructure unit costs updated based on current PB cost library. All infrastructure costs include construction contingency of 30% and mark-up of 25% for design, construction management and owner's costs.
- <sup>4</sup> Costs assume that railroad alignment remains within or adjacent to existing right-of-way.
- <sup>5</sup> Costs exclude rail right-of-way acquisition, utility relocation and highway grade separations.
- <sup>6</sup> Costs include allowance for station and parking lot property acquisition.
- <sup>7</sup> Grade separation of US Route 29/Lee Highway at Gainesville is a prerequisite for extension of VRE service to Haymarket in Phase 2. All highway grade separation projects assumed to be paid for and implemented by others.

**Key Elements of Estimate (Phase 1 Option 1 with Limited VRE Service, 3 weekday round trips and 1 new station at Gainesville):**

- <sup>1</sup> VRE weekday service: 3 trains to Washington in AM peak, 3 trains returning in PM (existing trains shifted from Broad Run).
- <sup>2</sup> No new VRE storage yard; all equipment stored overnight at VRE Broad Run yard.
- <sup>3</sup> Rolling stock assumed to be provided from existing available VRE fleet.
- <sup>4</sup> Rail infrastructure: Low end of range assumes projects between Manassas and Gainesville only (approx. 8 route-miles); high end of range includes additional projects to increase overall line capacity, as identified by Norfolk Southern.
- <sup>5</sup> Station at Gainesville only; low and high range of costs for facilities as described below for stations.
- <sup>6</sup> Parking spaces: Low end = 1000 structured; High end = 1500 structured.

**Key Elements of Estimate (Low end of range, Full VRE Service with 30-minute peak headways):**

- <sup>1</sup> Station costs include basic station facilities similar to existing VRE suburban stations; two platforms at each station; ADA-accessible pedestrian bridges at Sudley Manor and Gainesville.
- <sup>2</sup> Parking spaces: 1000 surface at Sudley Manor (Ph.1), 1000 structured at Gainesville (Ph.1), 500 surface at Haymarket (Ph.2).
- <sup>3</sup> VRE storage yard for 6 trainsets, location to be determined.
- <sup>4</sup> Rolling stock: 2 additional VRE trainsets (2 diesel locomotives, 12 bi-level coaches)

**Key Elements of Estimate (High end of range, Full VRE Service with 30-minute peak headways):**

- <sup>1</sup> Station costs include station buildings and transit-oriented development amenities at the three stations.
- <sup>2</sup> Parking spaces: 2000 structured each at Sudley Manor (Phase 1), Gainesville (Phase 1), and Haymarket (Phase 2) -- provides parking capacity for commuter express bus and carpools in addition to VRE.
- <sup>3</sup> VRE storage yard for 6 trainsets in Gainesville area, with 3.5 miles of additional main track.
- <sup>4</sup> Rolling stock: 3 additional VRE trainsets (3 diesel locomotives, 18 bi-level coaches)

**Comparison with Other Recent Capital Cost Estimates for Rail Line Expansion (Comparables):**

- Salt Lake City, Utah commuter rail line (new track along UP mainline): 38 mi. at \$13m/mile (excludes property)
- NJ Transit Tenafly-N.Bergen commuter rail line (new track along CSX mainline): 14 mi. at \$13.1m/mile (excludes parking, property acquisition)
- MBTA Greenbush commuter rail line, Boston, MA: \$26.6m/mi. (involves expansion of right-of-way in constrained urban/suburban setting)
- Escondido, San Diego County, CA diesel multiple unit (DMU) rail line: 22 mi. at \$16m/mile
- Tri-Rail double-tracking, South Florida: \$7.5m/mi. (rail infrastructure w/ limited station work, no vehicles, no yards)

## THE PUBLIC-PRIVATE PARTNERSHIP

The Gainesville-Haymarket project has multiple stakeholders, each with different goals for the project, different roles in implementing project, and a unique set of issues. Stakeholders who will benefit from the project include both public entities and private companies, and the opportunity exists for the VRE Gainesville-Haymarket extension project to be a successful public-private partnership that can serve as an example for other corridors and projects. A listing of the players and their key characteristics is provided in the table below.

**Table 3  
Project Stakeholders and Partners**

Stakeholder	Roles & Responsibilities	Potential Funding Contribution	Benefits Realized	Key Issues
Prince William County	Planning, land use, zoning and development approvals. Implementation of transit-oriented development regulations. Station site selection Arterial and local roadway construction	Portion of local share of traditional VRE funding. Station facilities, including platforms, pedestrian circulation, parking and vehicular access (if not covered by transit-oriented development). Development proffers. Possible creative financing.	Attractive development focused on town centers at three VRE stations/ transportation centers. Increased rail and bus mode share for commute trips, with net reduction of vehicle-miles traveled and traffic at key intersections versus No Build case.	Ensuring that denser development at transit-oriented development projects does not generate increased vehicle trips and congestion on key roadway links. Quality and compatibility of resulting development
Commonwealth of Virginia, Department of Rail & Public Transportation (VDRPT), Commonwealth Transportation Board, Rail Advisory Board	Represents statewide passenger and freight rail interests Prioritizes and approves funding via Rail Enhancement Fund and other sources.	Direct funding of specific capital projects. Ongoing capital and operating funding support for VRE. Possible creative financing.	Cost-effective solution for line haul public transportation in Gainesville-Haymarket corridor. Enhances statewide freight rail capacity, improving rail freight service for VA shippers in I-81 corridor.	Meeting criteria for funding via Rail Enhancement Fund. Priority of this project with respect to other rail initiatives within the Commonwealth
Federal Government	Contributor to project construction	Federal share of capital funding through traditional sources. Possible creative financing.	Good example of Public-Private Partnership and Transit Oriented Development.	Cost-effectiveness and extent of benefits of project.
Virginia Railway Express	Operator of trains Capital program and project management.	Capital and operating funds from traditional sources. Possible creative financing.	Significant progress towards Strategic Plan goals. Increased ridership. Improved level of service and market share.	Must have full investment in core network along with service expansion. Higher complexity and operating cost of service on Manassas Line split between two terminals (Broad Run and Haymarket).
Norfolk Southern Corporation	Right-of-Way owner	Share of rail infrastructure capacity investments	Improved speed, capacity and reliability Upgrade portion of 'B' Line to mainline standards.	Sufficient capital investment to offset operating impacts of introducing mixed passenger and freight service. Preservation of sufficient right-of-way to enable future expansion of freight and passenger service.





**Table 3**  
**Project Stakeholders and Partners, *continued***

Stakeholder	Roles & Responsibilities	Potential Funding Contribution	Benefits Realized	Key Issues
CSX Transportation	Owner of right-of-way between Alexandria and Washington, DC CSX controls number of VRE trains to/from Washington, per operating agreement.	—	Continued VRE and VA commitment to capital investment for capacity and reliability on CSX railroad.	Sufficient capital investment to permit increasing the number of daily VRE trains.
Amtrak	Owner of terminal facilities at Washington, DC Current contract operator of VRE service	—	Continued VRE and VA commitment to capital investment for capacity and reliability at Washington Terminal.	Sufficient capital investment to permit increasing the number of daily VRE trains operated and stored mid-day at Washington Terminal.
Virginia Dept. of Transportation	Management of state highway system	Rail-highway grade separations State highway capacity enhancement	Auto trips on I-66 and other state roadways diverted to rail	Availability and pace of funding for railroad grade separation projects; priority of 'B' Line projects versus other State needs.
Potomac & Rappahannock Transportation Commission	Co-owner of VRE Provider of bus service within Prince William County	Oversight of VRE and bus capital and operating funding via traditional processes.	Improved connectivity of regional transportation system with VRE-bus linkages.	Cost-effectiveness of new bus operations.
Station Area Developers	Transit-oriented development VRE rail station development	Construct station facilities and parking lots Partial funding of planning studies Development proffers	Increased development density per TOD regulations. Presence of convenient VRE service provides a marketing advantage. Retail opportunities at station areas.	Timing of VRE extension project relative to land development.
Property Owners Abutting Right-of-Way	Slivers of abutting properties may need to be acquired for widening of rail right-of-way in certain locations.	Development proffers	Increased value of remaining property due to accessibility of VRE	Cost of required property acquisitions or takings.
Major Employers in Corridor	Facilitate connections between rail stations and employment sites. Participation in Federal transit subsidy programs	Partial funding of planning studies. Subsidy of shuttle bus services.	Opportunity for reverse commuting on VRE, from inner city and suburbs. Provides means of access for workers who are transit-dependent.	Availability and quantity of reverse-peak service tied to CSX-VRE access agreement, which limits daily train movements.
City of Manassas	Easternmost 1.5 miles of the extension lies within City of Manassas	Portion of local share of traditional VRE funding.	Potential increased funding priority for grade crossing elimination projects within City of Manassas.	Relative timing of VRE extension and railroad-highway grade separation projects.
Commuters and the Public	Overall project support	VRE fares User fees and taxes dedicated to public transportation.	Improved VRE level of service. Relief of current parking and on-board seating constraints. Increases mobility choices within the corridor.	Quality of life. Property values. Highway congestion relief. Environmental quality.





# IMPLEMENTATION

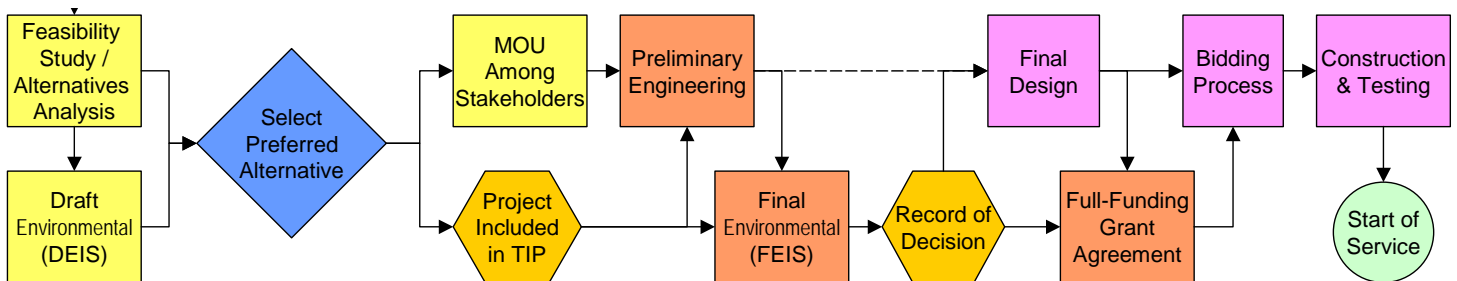
## Implementation Process

To start the process of implementation, a decision to proceed with further analytic studies is required by the principal stakeholders in the project – those entities responsible for providing the local share of required capital funding and/or ongoing operating support – which are expected to include:

- Virginia Railway Express (VRE)
- Norfolk Southern (NS)
- Virginia Dept. of Rail and Public Transportation (VDRPT)
- Virginia Dept. of Transportation (VDOT)
- Prince William County (PWC).

With the total capital cost of the project in excess of \$100 million, and given the relatively limited local capital funding available for a project such as this, it is likely that Federal funding will be sought for a portion of the required up-front capital investment. The implementation process and schedule in this report are based on the use of Federal funding and the analytic, environmental and public review process that the applicable Federal regulations require. The basic steps in the implementation process are shown in the figure below.

**Figure 5**  
**Project Implementation Process**  
(assuming Federal New Start funds are used)





The initial studies performed to-date have established the overall feasibility of the Gainesville-Haymarket extension, estimated the magnitude of the capital investment required to implement the project, and prepared an approximate implementation schedule. More detailed studies are required to more precisely define the elements of the project, refine the estimated costs, and ascertain whether the project meets applicable environmental standards. The project also needs to be developed in greater detail, in order to enable agreements to be reached among the stakeholders with respect to their roles, responsibilities, and obligations. This is the essential next step in the implementation process, requiring an early commitment of funding from the principal stakeholders.

This project, with its public-private partnership opportunities and tangible benefits for both passenger and freight rail service, should be eligible for State funding from the newly created Rail Enhancement Fund. The total cost of the extension project, however, will require access to additional sources of funding, potentially including Federal funds.

Two important pre-conditions for Federal funding are the completion of a rigorous alternatives analysis and documentation of environmental consequences of the project. The alternatives analysis, sometimes otherwise referred to as a major investment study, identifies and evaluates an array of alternative solutions to the transportation and mobility problems that the VRE extension project is intended to solve. The environmental analysis for a project such as this will result in the preparation of an Environmental Impact Statement (EIS), satisfying the requirements of the National Environmental Policy Act (NEPA). The shortest path to implementation entails preparing the alternatives analysis and the draft EIS simultaneously, resulting in the selection of a locally-preferred alternative. This process incorporates an extensive public outreach and participation program, culminating in a public hearing.

Before the project can proceed to design and final environmental documentation, it must be formally adopted and included in the region's Transportation Improvement Program (TIP).

Another important milestone is the formal agreement by the principal stakeholders on the scope and characteristics of the project and specific roles, responsibilities and funding obligations of each stakeholder. Enough information about the project will be generated by the Alternatives Analysis and Draft EIS to enable this agreement to be codified in a memorandum of understanding (MOU), to be executed by each principal stakeholder. The MOU will describe the preferred alternative – in terms of physical and operational characteristics, cost, and implementation phasing. It will outline the sources and uses of capital funds for the project – which are expected to be organized approximately as shown in the table below. Specific capital projects and their estimated costs will be defined, as well as the number, type and timing of VRE trains to be operated in each phase of implementation. Any agreed-upon limits or allowances, by time of day, on the usage of certain tracks by VRE and NS trains also will be specified. Construction-related requirements will be specified, such as maintenance and protection of NS through and local freight traffic during construction. Other contractual, legal, liability protection and other terms of agreement among the parties also will be identified.

Developing a funding plan for the project is likely to be a challenge, given the large number of potential partners. Table 4 presents a summary of the potential sources and uses of project capital funds.

**Table 4  
Anticipated Sources and Uses of Capital Funds for  
VRE Gainesville-Haymarket Extension**

Uses	Sources...								
	Federal	Traditional Local (VRE) Process	NS	Virginia/VDRPT (Direct)*	Prince William County	Station Area Developers	Major Employers & Prop. Owners	VDOT	Creative Sources
Feasibility & Environmental Studies	?	✓		✓	✓	✓	✓		
Rail Infrastructure	✓	✓	✓	✓			○		?
VRE Rolling Stock	✓	✓		✓					?
VRE Yards and Shops	✓	✓		✓					?
Highway Grade Separation					✓			✓	
Grade Crossing Improvements					✓				
Stations -- Sudley Manor		□			□	✓	○		
Stations -- Gainesville		□			□	✓	○		
Stations -- Haymarket		□			□	✓	?		
Core Capital Needs on Existing VRE Network	✓	✓		?					?

✓ - Most likely or preferred source of funding.

□ - Potential source, to the extent not paid for by transit-oriented development at stations.

○ - Potential source, for capacity that supports reverse-peak service.

? - Potential source, to be determined.

\* Potential sources in addition to regular VRE capital and operating support, including the Rail Enhancement Fund.

Prince William County will be responsible for selecting the sites for the three proposed VRE stations and funding construction of vehicular access, stations and parking. Prince William will have two primary means of providing the three stations. PWC may choose to engage with developers in transit-oriented development, with the developers bearing the costs associated with station construction through proffers or other mechanisms in exchange for increased density within the transit-oriented development adjacent to the station. Or, if agreement cannot be reached with developers at any of the station sites, the County could acquire the required property and develop roadway access, parking, and station facilities on its own.

Once the MOU has been signed and the project has been adopted as part of the TIP of the Metropolitan Washington Council of Governments (MWCOCG), the metropolitan planning organization for greater Washington, preliminary engineering can begin and the environmental review process finalized. A Final EIS document will be prepared, responding to comments raised by agency reviewers and the public during the draft stage. An additional round of public reviews will then occur, after which the sponsoring agency will provide a Record of Decision – approving the project, disapproving it or approving it will qualifications and requirements for mitigation of environmental impacts.

In order for Federal funds to be obtained to proceed with final design and construction, a full-funding grant agreement will be prepared and executed with FTA. The project will then proceed through Final Design, the preparation of contract documents, selection of contractors and construction of the required improvements and facilities.



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## **Decisions Affecting Scope and Phasing of Project**

During the detailed planning of the project, primarily in the MIS-DEIS stage, a number of factors and stakeholder decisions will affect the scope, cost and phasing of the project. These include:

- Elimination of US Route 29 grade crossing – This project is considered an essential prerequisite to the extension of VRE service from Gainesville to Haymarket. If it is not completed prior to the VRE extension project, then the Extension project will need to plan for an initial phase with an interim terminal at Gainesville.
- Other grade crossing eliminations – Appropriate solutions will need to be developed for the other existing grade crossings of the ‘B’ Line. Consideration will need to be given to grade separation where warranted, closure of minor crossings where possible, and upgraded crossing protection systems where crossings are retained. In light of the increased rail traffic generated by the project, existing plans for grade separations at locations such as State Route 28 and Wellington Road in Manassas and US 15 in Haymarket may need to be funded and implemented sooner than previously envisioned, and new alternatives may need to be explored at busy cross streets such as Godwin Drive in Manassas.
- Prince William County land use planning and location decisions concerning prospective stations and train storage yards – The planning and design of the VRE extension will need to progress in tandem with the evolution of the County plans for the corridor and the County’s response to specific development proposals that encompass the railroad. Each affects the other. The County will need to either update and amend the Comprehensive Plan to account for the land affected by the VRE extension, or undertake conformity reviews of individual facilities and affected locations on a case-by-case basis.
- Development timing – Another challenge will be to ensure that development projects along the rail line and the VRE extension project can proceed in parallel, but that each is not unduly dependent upon the other.
- VRE-NS Operating Agreement – The existing agreement, which defines the terms by which VRE operates Manassas Line trains on NS-owned tracks, will need to be re-negotiated to cover any extension of VRE service in the Gainesville-Haymarket corridor.
- VRE-CSX Operating Agreement – A similar agreement with CSX governs the operation of VRE trains on CSX-owned right-of-way, which includes the inner portion of the Manassas Line between Alexandria and Washington, DC. The existing agreement will need to be renegotiated in order for VRE service to grow beyond the current contract limit of 38-40 daily trains. However, the proposed initial start-up service can be accomplished under the existing agreement.
- Overall availability of funds – To the extent that initial funding is insufficient for the full project to Haymarket, a shorter project to an interim terminal at Gainesville could be implemented as a first phase, with service extended to Haymarket at a later date.



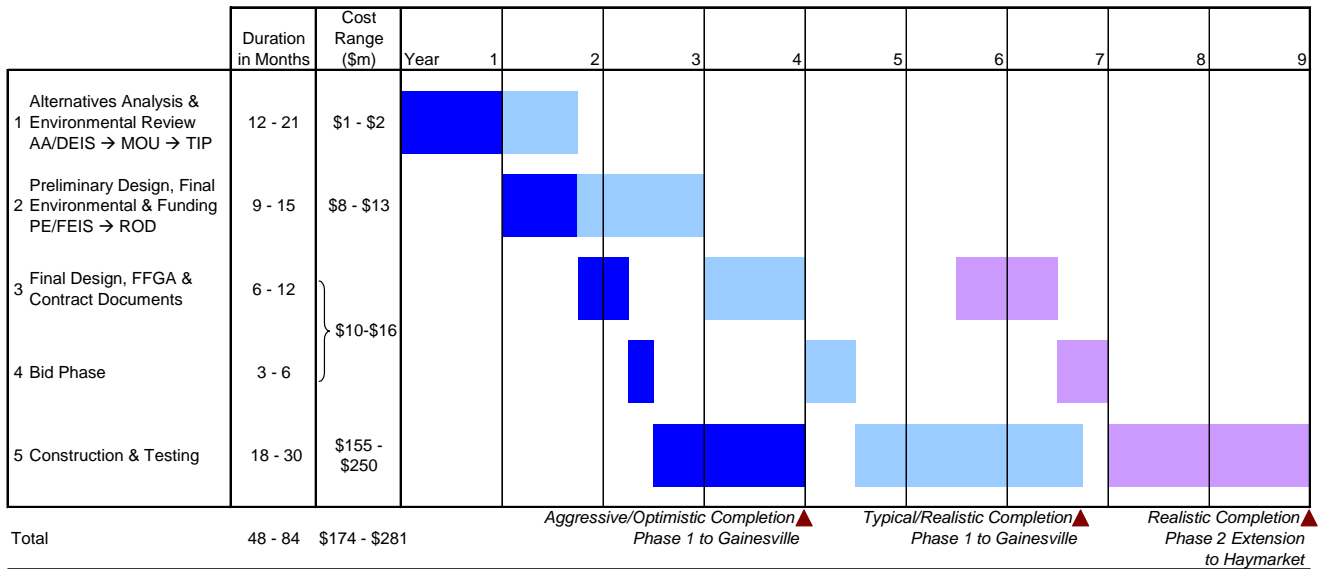
### Implementation Schedule

A realistic estimate of the time required to implement an initial phase extension of VRE service to Gainesville is seven years – from the time a “go” decision is made by the Commonwealth of Virginia and the other principal stakeholders. This assumes that Federal funding is used and that the multi-step Federal project review and approval process is followed. Figure 6 presents the range of time anticipated for each significant step in the implementation process.

Were the project to be implemented on a very aggressive, fast-track schedule – with no significant gaps awaiting Federal approvals, negotiating the stakeholder MOU or assembling funds – VRE trains could conceivably be running to and from Gainesville in four years, if all aspects of the project were to fall neatly into place. Given the complex agreements that will need to be reached among multiple stakeholders and the varied sources of funding that will need to be tapped, the realistic seven-year estimate is the more likely timeframe.

**Figure 6**  
**Gainesville-Haymarket Extension**  
**Implementation Schedule**

Schedule from time of approval of Major Investment Study funding



- AA -- Alternatives Analysis (process required for major transit investments that use Federal funding)
- DEIS -- Draft Environmental Impact Statement
- MOU -- Memorandum of Understanding among principal project stakeholders
- TIP -- Inclusion of project in regional Transportation Improvement Program
- PE -- Preliminary Engineering
- FEIS -- Final Environmental Impact Statement
- ROD -- Record of Decision on environmental impact analysis
- FFGA -- Full-Funding Grant Agreement with Federal Transit Administration (FTA)

Note: Schedule for each step includes allowance for associated regulatory approvals and acquisition of funding.





Opening of the full VRE extension to Haymarket is assumed to be possible in a nine-year timeframe. Timing of the westernmost three miles of the extension is constrained by the schedule for completion of the US Route 29 grade separation project at Gainesville, which currently is scheduled for completion in 2014. Construction of the railroad improvements between Gainesville and Haymarket could proceed simultaneously with the grade separation project.

The optimistic four year Phase 1 schedule assumes that funds for the various stages of design and construction are available as needed, from State, local and private sources, and with no significant delays. Similarly, this schedule assumes that the public and agency review process is conducted in a timely fashion, with agency approvals received in the minimum amount of allotted time. This requires a high level of commitment and discipline on the part of the participants in the process. Generally, fast-track implementation has been more successful when Federal funds and the associated review process can be avoided, particularly the New Starts process.

The seven-to-nine year schedule is more realistic and allows for some down time between stages of the project's design and construction, but even this schedule has its inherent risks for a timely completion, including the need to reach consensus and execute agreements among all of the project's key stakeholders, the need to assemble funding from multiple sources, the need for agency approvals, and potential delays associated with property acquisition.

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### **Comparable Service Extension Projects**

History has shown a relatively wide range of implementation timeframes for projects that can be considered comparable in magnitude and complexity to the VRE Gainesville-Haymarket extension. Three examples are summarized on the following page. All involve extensions of existing rail transit systems within the past decade. The first two involved Federal funding and a full array of public and agency reviews: The Washington Metrorail Blue Line extension from Addison Road to Largo, and the Baltimore Light Rail extensions to Hunt Valley, BWI Airport and Baltimore Penn Station. The third example, the Cleveland Waterfront Light Rail Extension, was implemented using State and local funds and was able to be implemented in a significantly shorter period of time.



**THE PROJECT IMPLEMENTATION PROCESS – EXAMPLE #1  
WMATA Metrorail Blue Line Extension to Largo**

Scope:  
Extension of the Metro Blue Line from Addison Road to Largo Town Center, 3.1 miles of new right-of-way, with 2 new stations. Total construction cost: \$456 m.

Timeline:

1972	Initial feasibility study of Addison Road to Bowie corridor by Prince Georges County & WMATA
1977	Largo Town Center plan adopted (transit-oriented development at terminal station)
1982	Prince Georges County Master Plan reserves right-of-way for transit extension
1990-1993	Alternatives Analysis – Addison Road to Bowie; Recommends Metro extension to Largo
Oct. 1996	DEIS published
May 1998	TEA-21 authorizes Largo extension as New Starts project
July 1998	Largo extension included in TIP
Dec. 1999	FEIS published
May 2001	Construction ground-breaking
Dec. 2004	Largo extension opened for service

**THE PROJECT IMPLEMENTATION PROCESS – Example #2  
Baltimore Light Rail Extensions to Hunt Valley, BWI Airport and Penn Station**

Scope:  
Three extensions of the Baltimore Central Light Rail Line, totaling 7.5 miles in length, with 8 new stations. Total construction cost: \$106 million.

Timeline:

1988	Maryland MTA requests Federal participation in funding of light rail extensions. (This happened while the initial 22 mile line was still under construction – using all State and local funds, it was opened for service in 1993, six years after the initial feasibility and alternatives study.)
1989	Alternatives Analysis/DEIS initiated for light rail extensions.
1990-1991	DEIS published (in three volumes, one for each extension project)
Oct. 1993	FEIS and US Army Corps of Engineers report published
Sep. 1994	Design-Build contract award
Sep. 1997	Hunt Valley Extension opened for service
Nov. 1997	BWI Airport Extension opened for service

**THE PROJECT IMPLEMENTATION PROCESS – Example #3  
Cleveland Waterfront Light Rail Extension**

Scope:  
Extension of the Cleveland Shaker Rapid light rail line at the downtown end of the line, totaling 1.5 route-miles of double track, with 5 new stations. Total capital cost: \$55 million. Extreme fast-track process to meet target opening date in summer of 1996, as "keystone" event of City of Cleveland's bicentennial. The project was entirely funded from state and local sources, via the Greater Cleveland Regional Transit Agency, supplemented with discretionary funds from the Governor of Ohio in connection with the bicentennial.

Timeline:

Oct. 1993	RFP Issued for conceptual design, environmental impact analysis meeting State of Ohio requirements, final design, right-of-way identification, contract documents, bidding support and engineering support during construction
Dec. 1993	Contract award
Apr. 1994	Completion of conceptual design and cost estimate
Jun. 1994	Start of final design
Aug. 1994 through Mar. 1996	Phased advertisement, bid and award of 18 construction and procurement contracts
May 1996	Construction substantially complete
Jul. 1996	Ribbon cutting and grand opening







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## **Conclusions and Action Plan**

Many factors are converging to create an exciting opportunity to make an investment in public transportation service:

- Rapid growth is creating demand for increased VRE service and raising local concerns about traffic congestion, mobility choice and quality of life in the corridor
- The rail right-of-way exists, and the right-of-way owner (NS) is a willing partner, with significant benefits to be gained from the project
- Substantial areas of undeveloped or underdeveloped land still exist along the rail line where stations might be located, and where the land can be developed in a manner that benefits the existing and planned development, the railroad operator and the public
- Developers and land owners are seeking to partner with the County and the railroad stakeholders to implement successful transit-oriented development at three proposed station sites.

However, the window of opportunity to make the project happen could be a small one, and time is of the essence. Development along the railroad will happen within the next ten years even without the VRE extension, making subsequent rail investment more difficult and less productive.

Fast implementation is easier to accomplish without Federal funding and without many partners. However, the magnitude of cost of the full Gainesville-Haymarket Extension is such that it is not likely to be able to be implemented solely with state, local and private funding. Creating a successful public-private partnership also will be a challenging and time-consuming effort – but one that will be necessary to make the project financially feasible.

The following are early action items that are recommended, once a “go” decision is made by the key project stakeholders:

- Secure funding for and conduct an engineering feasibility study, alternatives analysis and environmental review (VRE), using funds from the newly created Virginia Rail Enhancement Fund
- Develop corridor land use and station area plans and/or development guidelines as a basis for ongoing rail line extension planning (PWC)
- Secure right-of-way and property for stations and railroad yard and shop facility (VRE and PWC)
- Formalize working arrangements among stakeholders (All).



The scope of the feasibility study and alternatives analysis should include the following work efforts, at a minimum:

- Ridership projections for future VRE service incorporating the Gainesville-Haymarket extension, addressing the range of possible land use and development scenarios within the corridor
- Transit patronage projections for potential express bus services and other transit services at the potential station locations, in order to appropriately define parking space and station facility requirements
- Detailed railroad capacity analysis, using simulation tools and methods approved by CSX, NS and Amtrak, to verify the extent and configuration of railroad infrastructure required to enable each railroad operator to accommodate its future growth needs and provide reliable service to its customers
- Assessment of the impact of the extension on the existing railroad network
- Conceptual engineering of the rail alignment (including alternative alignments where these exist), to provide a basis for accurate cost estimating
- Identification of appropriate solutions for all existing grade crossings, including evaluating grade separation, improved crossing protection, and closure options
- Analysis of impacts of alternative station locations and station-area development scenarios on potential VRE ridership, the rail alignment and rail infrastructure requirements
- Analysis of alternative implementation phasing plans
- All-inclusive conceptual cost estimates, more precise than the estimates currently available and with a narrower range from low end to high end
- Financial analyses of the project, to identify sources of capital funding for the project and determine the level of projected operating subsidies following completion of the project
- Close coordination with railroad stakeholders, to ensure that the project emerging from the feasibility study, and its estimated costs, incorporate all of the elements required to meet the needs and requirements of the railroads associated with the project.