



**Spotsylvania County**  
**VRE Commuter Rail Station**  
**Site Screening Analysis**  
**Final Technical Memorandum**

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# 1 Introduction

## 1.1 Study Purpose

The purpose of this technical memorandum is to evaluate alternative locations for a proposed Virginia Railway Express (VRE) Commuter Rail Station in Spotsylvania County. Fourteen site locations were evaluated through a two-tiered screening process. Two sites moved forward through the second tier screening analysis.

This analysis also presents conceptual designs for commuter rail stations for the two alternative sites remaining after the screening process. The concept design includes a station platform/canopy with a surface parking facility to accommodate 1,000 vehicles on opening day. The estimate also reserves space sized appropriately for a future parking deck to accommodate 1,000 vehicles and additional space for building a future 1,000 vehicle Park & Ride lot. The concept station design includes area for a Kiss & Ride Lot. The parking lot is set back from the platforms to provide the area for a Kiss & Ride where possible. The cost estimate also provides estimates for a pedestrian bridge to access platforms located on the western side of the CSX tracks, lighting, and potential permitting fees which are all combined to give a unique cost estimate for the new facility at each of the two locations. Platforms on the west side of the tracks would be built in a future phases, and only after new station(s) are built beyond Spotsylvania County. Although it is assumed that VRE would typically load passengers on east side platforms (consistent with current operations), west side platforms provide VRE, Amtrak and CSX valuable operational flexibility. In addition, concept-level capital cost for the site alternatives is provided in Section 5. Establishment of VRE Service in Spotsylvania County.

VRE has provided commuter rail service from the Northern Virginia suburbs to downtown Washington, D.C. since 1992. With the continued rapid growth in commuting from Spotsylvania County to Washington DC and the other northern Virginia suburbs, it became apparent to county leaders that rail service was necessary to ensure the long-term economic vitality of the County.

On August 18, 2009, the Spotsylvania County Board of Supervisors adopted an ordinance for the County to join the Potomac and Rappahannock Transportation Commission (PRTC) and the Virginia Railway Express (VRE). PRTC and Spotsylvania County signed the *Agreement Governing Spotsylvania County's Admission to Membership in PRTC And Participation In the VRE* ("the Agreement"). PRTC is a regional transportation district comprised of six jurisdictions now including Spotsylvania County.

To join PRTC and VRE, the County needed both the approval of PRTC and the North Virginia Transportation Commission (NVTC). This approval was granted on November 30, 2009 and the the County's membership in the PRTC and VRE became active in February 2010. The decision to join VRE includes the provision for the construction of a new VRE station in Spotsylvania County (being analyzed in this technical memorandum). Responsibilities for the planning, design and funding of infrastructure investments are addressed in Section 7 of the Agreement.

In order to initiate service in Spotsylvania County, the Agreement has numerous stipulations which include construction of a commuter rail station within the County.



The County is responsible for funding the acquisition of property, environmental review, design, and construction of a commuter rail station, including a boarding platform in the CSX railroad right-of-way. The platform locations are subject to a station lease between VRE and CSX Transportation and under the operation and control of VRE. The Agreement also stipulates that the ultimate location of the commuter rail station will be at a site agreed upon by both the County and VRE.

The Agreement states that the station design will be consistent with the design of stations now served by the VRE service and must also be approved by VRE. The Agreement requires a minimum amount of parking at the Station of at least 1,000 parking spaces that may be built in phases approved by the VRE. The cost estimate developed for this study provides estimates for two build out scenarios:

1. 1,000 space parking lot/station; and
2. 3,000 space parking facility that includes 1,000 surface parking spaces for the VRE station, 1,000 surface spaces for a Park & Ride Lot, and 1,000 spaces in a structured parking garage. The revised design was initially proposed at the January 2010 Workshop for the project.

Another stipulation that is directly related to the station construction is the required extension of the third track past the VRE layover yard at MP 53.2. The Agreement states that VRE is responsible for funding the property acquisition, environmental review, design, and construction of an extension of the existing railroad right-of way, and all other related infrastructure necessary to provide VRE service to the future station.

## 1.2 Project Consistency with Planning Goals

The implementation of VRE service to Spotsylvania County is consistent with both Spotsylvania County's and VRE's long-term transportation planning goals. Goals and objectives identified in the County's Comprehensive Plan include:

1. "Develop a transportation network that supports the County's Comprehensive Plan and achieves a level of service that promotes safe and efficient operation and movement of people and goods.
2. Provide a Transportation network that promotes economic development within the County.
3. Promote alternative modes of transportation and multi-modal facilities to more effectively address demands on the transportation network."<sup>1</sup>

The VRE Strategic Plan 2004-2025 also recommends the construction of a commuter rail station in the County. Currently, hundreds of Spotsylvania commuters are accessing the VRE system by driving to nearby Park & Ride lots in neighboring locations. According to the Metropolitan Washington Council of Governments (MWCOG), "the number of work trips made by residents of Spotsylvania and Fredericksburg will increase by 45 percent between now and 2025."<sup>2</sup> The construction of this new station could help ease some of the commuter challenges.

The VRE Strategic Plan identifies several reasons for the creation of a new station in Spotsylvania County:

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<sup>1</sup> Virginia Railway Express, *VRE Strategic Plan 2004-2025*, pg 7.

<sup>2</sup> *Ibid*, pg 85.



- The Strategic Plan states that “the station is a relatively low-cost option for VRE”<sup>3</sup> and would require only minor changes to the current railroad operation plan, since VRE Fredericksburg trains already operate to and from the VRE storage yard in the County.
- Construction of the station would relieve pressure for additional station parking in downtown Fredericksburg, which would be expensive to construct and is also inconsistent with the City’s plans for the station area.
- The VRE Plan recommended a new station at US Route 17 Bypass (Mills Drive) in Spotsylvania County (in the vicinity of the VRE layover yard).

### 1.3 Study Approach

The methodology used in this study consisted of a two-tiered screening process that qualitatively evaluated potential environmental impacts and “fatal flaws” of the alternative sites. Steps for this analysis included:

- Develop concept station footprint and design.
- Identify minimum site selection criteria and select sites.
- Evaluate 14 alternative sites through the first tier screening process.
- Develop Tier II evaluation criteria.
- Evaluate two alternative sites with Tier II screening criteria.
- Develop concept cost estimates for two alternative sites identified in Tier II screening.

### 1.4 Study Area Description

**Figure 1** provides a map of the study area with rail milepost references as well as the major roadways that serve the study area.

The study area extends along the CSX RF&P rail corridor in the County and the City of Fredericksburg. The study area is bound by the Spotsylvania County/City of Fredericksburg border to the north at Milepost (MP) CFP57.5 and the southern limit of the study area is at VRE’s Crossroads Yard at MP CFP 53.2. The existing rail corridor passes through the National Park Service (NPS) Fredericksburg and Spotsylvania National Military Park. Additionally, the study area also includes historic sites, businesses, industrial locations, and residential developments.

The evaluation of roadway access to the CSX Rail Corridor is an important element of this study. Commuters, carpools, and future transit service accessing the station will affect Levels Of Service (LOS) and congestion on the region’s roadways. Benchmark Road and State Route 2/Business 17 (Tidewater Trail) run parallel to the rail corridor on the east and I-95 parallels the tracks on the west. US Route 17 Bypass (Mills Drive) runs perpendicular to tracks at the southern end of the study area. **Table 1** identifies the Roadway Functional Classifications for roads that serve the study area. Roadways that would serve the station are expected to maintain County level of service standards.

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<sup>3</sup> Ibid, pg 85.



**Table 1: Study Area Roadways**

Roadway	Functional Classification	Relation to CSX Rail Corridor
<b>Interstate 95</b>	Freeway/Interstate	Parallels the rail corridor about 2-3 miles west of the study corridor.
<b>State Route 2 / Business Route 17 (Tidewater Trail)</b>	Principal Arterial	Parallels the rail corridor between 0.5 – 1 mile east of the study corridor.
<b>US Route 17 Bypass (Mills Drive)</b>	Principal Arterial	Grade-separated crossing perpendicular to the tracks in the vicinity of Sites 1 and 2.
<b>Benchmark Road</b>	Major Collector	Parallels track and intersects Mine Road with a T-intersection in the vicinity of Sites 4 and 5.
<b>Lansdowne Road</b>	Minor Arterial	Crosses tracks at-grade in the vicinity of Sites 6 and 7.
<b>Mine Road</b>	Minor Arterial	Crosses tracks at-grade to a T-intersection with Benchmark Road. Intersects Benchmark Road in the vicinity of Sites 4 and 5.

Source: Spotsylvania County, Virginia, 2008 *Spotsylvania County, Virginia Comprehensive Plan, Chapter 6 - Transportation Element, Functional Classifications Update Map 2008*, Follows Page 33.

### 1.4.1 Highway Level-of Service

The County provides highway level of service standards in its Comprehensive Plan. Roadway Level of Service (LOS) goals for roads within the “Primary Development Boundary” of the County is to maintain:

- A “C” Daily Level of Service on all County secondary roads within the County’s Primary Development Boundary.
- A “D” Peak Hour Level of Service on all County secondary roads within the County’s Primary Development Boundary.





#### 1.4.2 Existing Bicycle and Pedestrian Network

The existing bicycle and pedestrian network that serves the study corridor is minimal. There are no sidewalks or bicycle lanes on the primary roads that serve the study area.

#### 1.4.3 Existing Transit Service

The study area is currently only marginally served by fixed route bus service. Route S2 of The Fredericksburg Regional Transit System (FRED) serves an area west of the tracks along US Route 17 Bypass (Mills Drive). FRED also provides a commuter route between a commuter lot on Gordon Road in Spotsylvania County and the VRE Fredericksburg Station but the route operates outside the study area boundaries.

#### 1.4.4 Natural Resources

The habitat search identified two threatened and endangered species which may be present in Spotsylvania County. One species, the *Green Floater Mussel* exists in protected waters of the Rappahannock River. It is not likely that the mussel would be directly impacted by the construction of a station at any of the sites analyzed because of the distance to the river.

The *American Bald Eagle* also nests in Spotsylvania County, although no Bald Eagle nests are known to exist within any of the sites being analyzed according to the Virginia Department of Game and Inland Fisheries Fish and Wildlife Service database.

#### 1.4.5 Identified Cultural Resources

Numerous cultural resources exist within the general study area:

- *Fredericksburg and Spotsylvania National Military Park.* The Park is owned and maintained by the National Park Service. The Park is the location of the historic Battle of Fredericksburg which occurred in 1862, in the second year of the Civil War. More than 85,000 men were wounded and 15,000 killed in this battle.
- *LaVue House* is an historic property adjacent to the tracks at the southern end of the study area. LaVue was listed in the National Register of Historic Places in 1994. The property dates to 1827 and was built by the John Alsop family.
- *The Meade Pyramid.* The Meade Pyramid is a pyramid structure located within Fredericksburg & Spotsylvania National Military Park and is visible from the railroad tracks. The pyramid was erected by the Confederate Memorial Literary Society with funding provided by the Richmond, Fredericksburg and Potomac Railroad in 1897. The monument marks the point where General George G. Meade's Union division penetrated the boggy gap in "Stonewall" Jackson's lines on December 13, 1862. Meade Pyramid is a contributing element of the National Military Park.

Archeological sites also exist within the study area, including sites related to the Civil War era and the significant battles that occurred within the County and City of Fredericksburg.



Figure 1: Study Area



## 2 Site Selection Criteria

As part of the study, a two-tiered screening methodology was developed to evaluate alternative site locations. Fourteen (14) alternative site locations were identified and evaluated for the first tier screening.

Based on discussions and consensus reached with VRE and Spotsylvania County staff, the selection criteria used to identify and select potential sites were:

- The site must be adjacent/border the CSX RF&P rail corridor.
- Alternative site locations considered for the analysis must be along a tangent (straight) section of railroad track of at least 1,000 feet in length.
- The site must be located between the Spotsylvania County Line (MP CFP 57.5) and the Crossroads (XR) Milepost (MP CFP 53.2) on the CSX RF&P rail corridor. The XR milepost is the location of the lead track into the existing VRE layover yard.
- The site should be a minimum of 27 acres in size to accommodate the full build-out of the station as described as well as excess land for ancillary design features. The assumption for parking requirements is 3,000 parking spaces at full build-out that includes 1,000 surface parking spaces to be built initially, and 1,000 parking spaces for a potential future VDOT Park & Ride lot and 1,000 space VRE parking garage to be constructed as demand increases.
- The VRE Crossroads Layover Yard is not being considered as a potential site for safety and security reasons.
- No sites within the Fredericksburg & Spotsylvania National Military Park are being considered.

The following describes the site selection criteria in more detail.

### 2.1 Project Limits

The sites evaluated in this study are located between the Spotsylvania County Line at MP CFP 57.5 (Lansdowne Road Grade Crossing) and the Crossroads Milepost XR (MP CFP 53.2) north of the VRE layover yard. No sites were considered south of the XR milepost or beyond the County Line to the north. Although a station site south of the layover yard is possible, it would likely come with a substantial operating cost to VRE (e.g. deadhead miles between the layover yard and station) and create additional operational complexities on the shared passenger/freight corridor. These criteria limited the site selection to a 4.3 mile segment of the CSX RF&P Corridor running between the layover yard and the County Line. The segment of the corridor that is suitable for a station site is further reduced to 2.5 miles of track when subtracting the length of corridor which travels through the Fredericksburg and Spotsylvania National Military Park which is discussed in more detail on the next page.

#### 1. Size (Site Capacity and Flexibility)

The site selection process considered the land requirements for an initial and full-build out requirements. The project team determined that approximately 27 acres of land would be needed for



the station at full build-out. The County desires a 1,000 space surface parking lot on “opening day,” and enough additional land for the future development of a 1,000 space VRE parking deck and 1,000 additional vehicle park and ride spaces.

## **2. Tangent Rail Segments (VRE Station Layout and Platform Requirements)**

VRE station requirements were used to ensure compliance with station design specification. Tangent track sections would accommodate the station design and loading platforms. Platforms 800 feet in length were assumed for this analysis. The project team determined that a tangent (straight section) of track 1,000 feet in length is needed to accommodate the platforms. The length of straight track required is a function of the number of cars in a trainset and requirements of the Americans with Disabilities Act (ADA).

## **3. Elimination of Sites within the Fredericksburg and Spotsylvania National Military Park**

The Fredericksburg and Spotsylvania National Military Park is located within the middle of the study area corridor. Although there are tangent sections of track long enough to accommodate platforms within the Park, the study team determined that it is highly unlikely that a station could be constructed within the historic park site. The Park is located on federal land outside of the County’s jurisdiction. The amount of mitigation that would be required for the National Park Service to comply with the National Historic Preservation Act would be difficult and complex undertaking. Because of the significant history of the Park, any potential locations that met the other three basic criteria but were within the Park boundaries were not considered.

## **2.2 Initial Candidate Sites**

Using the initial site selection criteria described, 14 sites were identified within the study corridor for the screening analysis. Sites were considered on both the east and west sides of the track. **Table 2** summarizes the locations of each site. **Figure 2** shows the fourteen site locations.



**Table 2: Initial Candidate Sites**

Site Number	Location	Rail Milepost
1A	East Side of Tracks @ Crossroads Parkway	53.3
1B	West Side of Tracks @ LaVue Lane	53.3
2A	East Side of Tracks @ Benchmark Road	53.4
2B	West Side of Tracks @ Eagle Drive	53.4
3A	East Side of Tracks @ Benchmark Road	54.2
3B	West Side of Tracks @ 3,000' Feet North of Eagle Drive	54.2
4A	East Side of Tracks @ Mine & Benchmark Rd	54.9
4B	West Side of Tracks @ 700' South of Mine Road	54.9
5A	East Side of Tracks @ Mine Rd & Benchmark Road	55.0
5B	West Side of Tracks @ Mine Road (bisected)	55.0
6A	East Side of Tracks @ Shannon Park Drive	57.4
6B	West Side of Tracks @ Latimers Knoll Court	57.4
7A	East Side of Tracks @ Lee Hill Drive	57.5
7B	West Side of Tracks @ Lansdowne Road	57.5

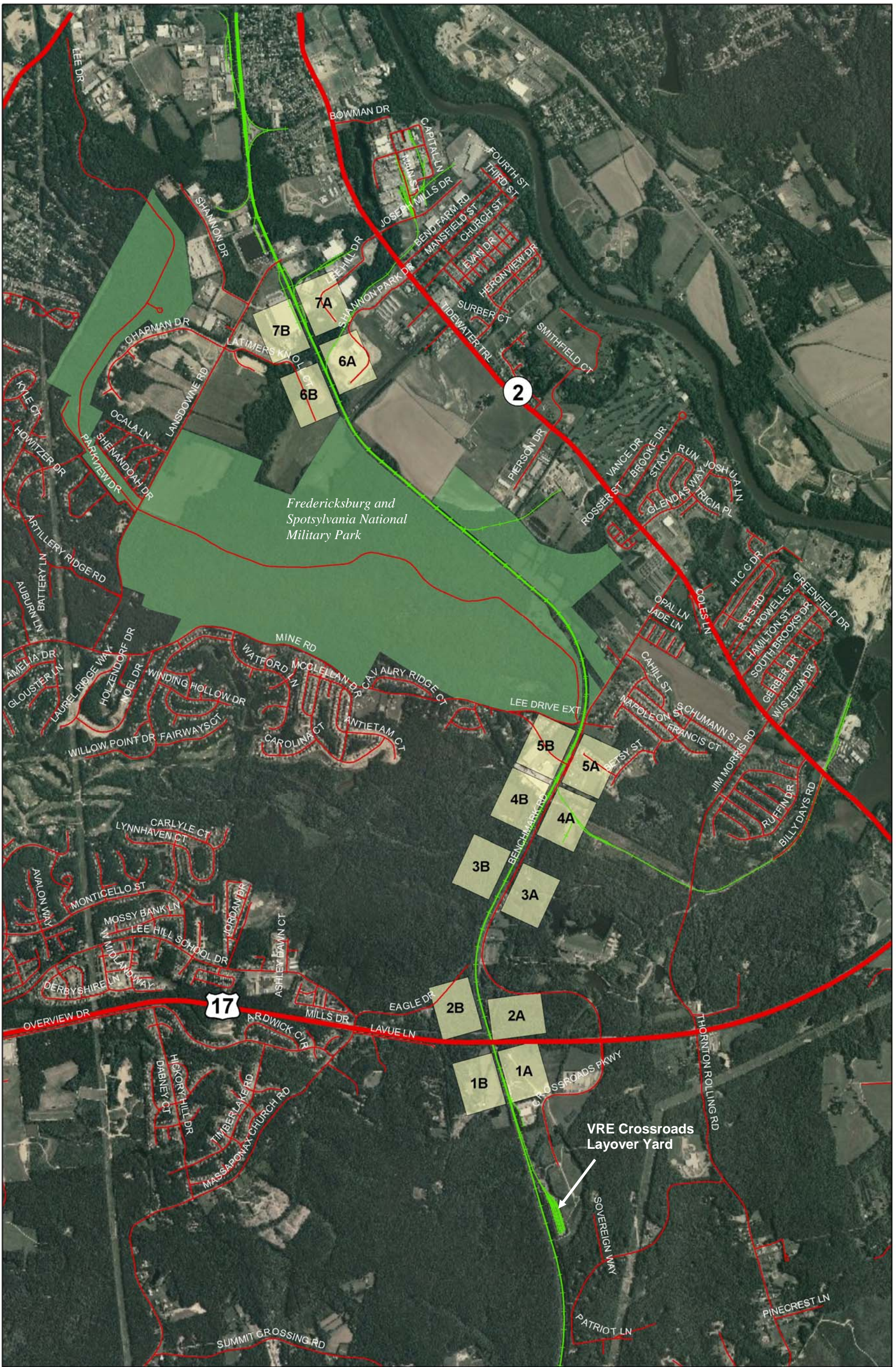


Figure 2: Candidate Station Sites



### 3 Tier I Screening

Twelve sites were eliminated from further consideration after the first-tier screening. Eight (8) sites were identified as having substantial wetlands and could be eliminated by that criterion alone. Wetland mapping is shown in **Figure 3**. This section describes the first-tier screening analysis and site specific reasons for elimination where applicable.

#### 3.1 Tier I Screening Criteria

The Tier I screening qualitatively evaluated a range of environmental characteristics at each site. This phase of analysis included a brief environmental review and screening summary based on existing data sources supplied by Spotsylvania County, VRE and other readily available data sources such as the USGS National Wetland Inventory (NWI) and FEMA/County floodplain mapping which were used in the first tier screening. This analysis qualitatively evaluated likely “fatal flaw” impacts of development for fourteen sites in the following resource areas:

1. Preliminary review of potential natural/environmental impacts, e.g. wetlands, wildlife habitat, and floodplains.
2. Transportation access and safety such as existing roadway, transit and/or pedestrian/bicycle facilities that could serve the site as well as the location of rail at-grade crossings.
3. Residential/Business displacements and potential land acquisition/takings.
4. Known site contamination (e.g. Site 4A, which is an EPA Superfund site).
5. Sites with identified cultural resources (e.g. Site 1B, a property listed in the National Register of Historic Places).

A description of the fourteen sites is provided in the next section, and where applicable, the key rationale for elimination.

#### 3.2 Screening Results

1. **1A – South of Mills Drive (east of tracks)**. This site is located just north of the VRE layover yard in the Crossroads Industrial Park. Direct access to the site and into the commercial park is provided by Crossroads Parkway via US Route 17 Bypass (Mills Drive) and Benchmark Road. This location has excellent access to commuters using Interstate 95, located approximately 3.2 miles to the west, and US Route 17 Bypass (Mills Drive). Connections between US Route 17 Bypass (Mills Drive) and I-95 will be enhanced when a new interchange is completed. US Route 17 Bypass (Mills Drive) also has the highest functional classification of all the access roads that serve the study area, and may be able to absorb higher traffic volumes. The site is zoned for industrial/commercial development but is not currently developed (vacant). The NWI identifies a small wetland formation on the site in the northeast corner, which could be avoided. This site advanced to the second tier screening.
2. **1B – South of Mills Drive (west of tracks)**. This site is located south of US Route 17 Bypass (Mills Drive) and west of the railroad tracks. The site is the location of the privately owned historic *La LaVue House* property, which dates to 1827 and is listed on the National Register of Historic Places (NRHP). The site location can be accessed via US Route 17, Massaponax Church Road,



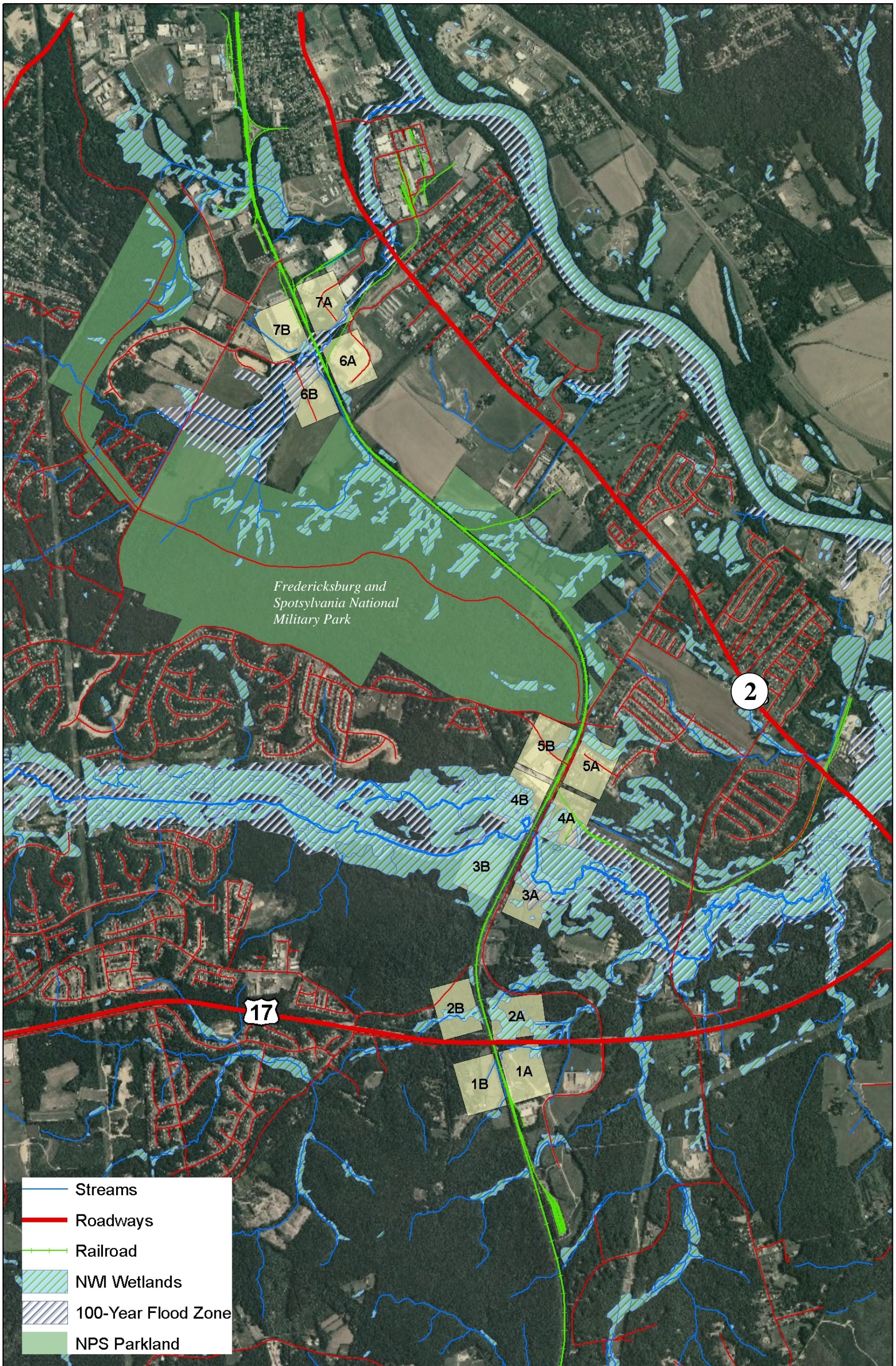
and LaVue Lane. This site was eliminated from further analysis because the property is listed in the NRHP.

3. **2A – North of Mills Drive (east of tracks).** This site is situated north of US Route 17 Bypass (Mills Drive) and east of the railroad tracks. The site can be accessed via Benchmark Road. A review of the National Wetland Inventory (NWI) mapping conservatively indicates that approximately 50 percent of the site is covered in wetlands. This site was eliminated from further analysis because of the amount of wetlands that could be impacted and the expected permitting complexities.
4. **2B – North of Mills Drive (west of tracks).** This site is situated north of US Route 17 Bypass (Mills Drive) and west of the railroad tracks. The site can be accessed via a private road, Eagle Drive. A review of the NWI mapping conservatively indicates that approximately 20 percent of the site is covered in wetlands (at the center of the site). This site was eliminated from further analysis because the amount of wetlands that could be impacted, expected permitting complexities and because of limited roadway access. Eagle Drive is currently a private road with poor intersection geometry with the US Route 17 Bypass.
5. **3A – East of Benchmark Road (east of tracks).** This site is located off Benchmark Road. A review of NWI mapping indicates that about 50 percent of the site is covered by wetlands and the northern part of the site is located in the 100-year floodplain of Massaponax Creek. Environmental permitting and mitigation would be more costly and complex than other alternative sites. Another disadvantage of this site is that the track embankment is approximately 20 feet above the surrounding grade at this location. This would necessitate elevated structures and platforms. Roadway access is limited by Benchmark Road as well. This site was eliminated from further consideration because of the amount of wetland cover, expected permitting complexities, location within a flood plain and the difference in grade of the railroad track.
6. **3B – West of Benchmark Road (west of tracks).** A review of site 3B using NWI mapping indicates that the site is completely covered (100 percent) by wetlands. The northern part of the site is located in the 100-year floodplain of Massaponax Creek. This site would likely be the most costly and complex for environmental permitting and mitigation. Like Site 3A, another disadvantage of this site is that the track embankment is approximately 20 feet above the surrounding grade and would necessitate elevated structures and platforms. There is currently no direct roadway access. This site was eliminated from further consideration because of the amount of wetland cover, expected permitting complexities, location within a floodplain and the difference in grade of the railroad track.
7. **4A – South of Mine Road (east of tracks).** Site 4A can be reached from the north and south via Benchmark Road, and from the west via Mine Road. Field reviews and track mapping identified this location as an EPA Superfund Site. The site was previously occupied by L.A. Clarke and Son, a wood preservation facility that used creosote and other chemical components. Because this location contains hazardous materials and is a designated EPA Superfund site, it was eliminated from further consideration. NWI mapping indicates that about 30 percent of the site contains wetlands and the southern portion of the site is located in the 100-year floodplain of Massaponax Creek. A residential displacement, grade crossing safety and commuter access also limit this site's potential.





8. **4B – South of Mine Road (west of tracks).** There is currently no direct roadway access to the site. Construction of a commuter rail station at this location would also likely displace several businesses. NWI mapping indicate that about 75 percent of the site contains wetlands and the southern portion of the site is located in the 100-year floodplain of Massaponax Creek. Field reviews identified a pond and pump station. A business displacement, grade crossing safety at Mine Road and commuter access also limit this site's potential and thus it was eliminated from further consideration
9. **5A – Sunset Hills Lane (east of Benchmark Road and tracks).** Mine Road provides indirect access to this location on the east side of the rail grade crossing. Traffic volumes generated by the commuter rail station would be a safety and traffic operations issue for both the roads and the railroad. About 35 residences and two businesses are located on or adjacent to this site. The construction of a commuter rail station at this location would also likely displace both residences and businesses. NWI mapping indicate that about 20 percent of the site contains wetlands. Poor roadway commuter access also limits this site's potential. Based on the number of residences that could be displaced and access issues this site was eliminated from further consideration.
10. **5B – Mine Road (west of Benchmark Road and tracks).** Mine Road bisects this sitesite on the west side of the rail grade crossing. The volume of new traffic at the grade crossing would be a safety and traffic operations issue. The Mine Road alignment would likely need to be shifted to provide enough space for the station. The construction of a commuter rail station at this location may also displace approximately 11 residences and 2 businesses. NWI mapping indicate that about 10 percent of the site contains wetlands. Roadway commuter access also limits this site's potential. The site is also adjacent to the Fredericksburg and Spotsylvania National Military Park and the potential for cultural resource impacts could be higher than other locations. For the reasons described, this site was eliminated from further analysis.
11. **6A – Shannon Park Drive (east of tracks).** This site is accessed by Lansdowne Road from the west and US Route 2 (Tidewater Trail) from the north and south. Commuters travelling east bound would cross the tracks at-grade via Lansdowne Road. The volume of new traffic at the grade crossing would be a safety and traffic operations issue. Field reviews identified numerous active businesses and commercial activity including Shannon Airport, Fredericksburg Field House, and Riverside Brick Company. In order to develop the site, there may be 29 business displacements. The amount of business displacements expected and other reasons described eliminated this site from further consideration.





- 12. 6B – Latimers Knoll Court (west of tracks).** This site is located on Latimers Knoll Court off Lansdowne Road at the County boundary with Fredericksburg. Lansdowne Road does not offer a direct connection to I-95 and there is an at-grade crossing that commuters would have to use travelling west from Fredericksburg. The site is located on the west side of the tracks which may be considered a small operational disadvantage; however, the third track in the corridor is already in place at this location which is an advantage operationally. There appears to be a small wetland formation on the site according to NWI, and a small stream was observed north of the site that empties into existing wetlands between sites 6B and 7B. About 40 percent of the site is located in the 100-year floodplain of Deep Run. The site borders the Fredericksburg and Spotsylvania National Military Park and the chance for cultural resource impacts may be greater because of the proximity to the Park. The close proximity of this location to the existing Fredericksburg Station (1.3 miles) may also affect VRE run times/operational speeds between the two stations, i.e. trains leaving this location would need to decelerate quickly to serve Fredericksburg Station. This site advanced to the Tier II analysis.
- 13. 7A – Lee Hill Drive (east of tracks).** Site 7A is located on Lee Hill Drive. The site is accessed by Lansdowne Road from the West and US Route 2 (Tidewater Trail) from the north and south. Commuters travelling east bound would cross the tracks at-grade at Lansdowne Road. The volume of new traffic at the grade crossing would be a safety and traffic operations issue. Use of this site for the Spotsylvania VRE station would impact 14 businesses in the industrial park. Due to the amount of business displacements and access issues, this site has been eliminated from further consideration.
- 14. 7B – South of Lansdowne Road (west of tracks).** A commuter rail station at this site poses various challenges. An active and large CVS distribution center is located on the site. Grade crossings at Lansdowne Road would affect traffic safety and operations. A small wetland formation at the south part of the site is in the vicinity of Deep Run and the wetland area is also within the stream's 100-year floodplain. The impact to the CVS distribution center removes this site from further consideration.

Twelve of the initial fourteen sites were eliminated in the Tier I screening analysis as summarized in Table 3. The twelve sites that were eliminated from consideration had “fatal flaws” which would have substantially reduced their viability as commuter rail station sites. The two remaining sites, 1A and 6B, appeared not to have obvious constraints were advanced to the Tier II analysis. In addition to meeting the basic criteria, Site 1A is located in the general area recommended by the County and VRE for a station. Site 1A and 6B are located in industrial areas and appear not to cause any residential or business displacements. The Tier II screening provides a more detailed analysis of the environmental constraints and potential impacts resulting from development at each site.



**Table 3: Sites Eliminated in Tier I Screening**

Site Number	Location	Reasons for Elimination
1B	West Side of Tracks @ LaVue Lane	Cultural resource impacts
2A	East Side of Tracks @ Benchmark Road	Wetland impacts, permitting complexities
2B	West Side of Tracks @ Eagle Drive	Wetland impacts, permitting complexities, private road with poor intersection geometry
3A	East Side of Tracks @ Benchmark Road	Wetlands and flood plain impacts , roadway access, rail grade differences
3B	West Side of Tracks @ 3,000' north of Eagle Drive	Wetlands and flood plain impacts , no roadway access, rail grade differences
4A	East Side of Tracks Mine & Benchmark Rd	Environmental contamination, wetlands and flood plain impacts , roadway access, residential and business displacements
4B	West Side of Tracks @ 700' south of Mine Road	Wetlands and flood plain impacts , no roadway access, residential and business displacements
5A	East Side of Tracks @ Mine Road and Benchmark Road	Residential and business displacements, wetland impacts, roadway access
5B	West Side of Tracks @ Mine Road	Residential and business displacements, roadway access that would require realignment of Mine Road.
6A	East Side of Tracks @ Shannon Park Drive	Business displacement and roadway access (grade crossing)
7A	East Side of Tracks @ Lee Hill Drive	Business displacement and roadway access (grade crossing), VRE operations
7B	West Side of Tracks@ Lansdowne Road	Business displacement and roadway access (grade crossing), VRE operations



## 4 Tier II Screening

This section provides a more detailed environmental review and comparison of Sites 1A and 6B. Through field reviews, review of existing data and the input provided by VRE and Spotsylvania County Staff at the January 2010 Project Workshop, these two sites appeared to be the strongest site alternatives. The general location of Site 1A is also consistent with the location recommendations in VRE's Strategic Plan.<sup>4</sup>

### 4.1 Evaluation Criteria

The second tier screening analyzed more detailed environmental characteristics of the two remaining alternative sites. This phase further refined the analysis to include a brief environmental review and screening summary based on existing data sources supplied by Spotsylvania County, VRE and other readily available data sources. This analysis qualitatively compares the two alternative sites in the following resource areas:

1. Preliminary review of potential natural/environmental impacts, e.g. wetlands, wildlife habitat, and floodplains.
2. Land use consistency and planning/development goals of the County.
3. Qualitative evaluation of the impact to CSX, VRE and Amtrak rail operations and flexibility.
4. Existing roadway, transit and/or pedestrian/bicycle facilities that could serve the site.
5. Site capacity and flexibility.
6. Concept-level cost estimates based on existing cost information for the construction of other VRE facilities.

Sources of information for this phase of analysis included:

- Topographic maps from the U.S. Geological Survey at 1"=2000'.
- Street/transit maps of the County.
- US Geological Survey National Wetland Inventory Mapping (NWI).
- Virginia Department of Historic Resources (DHR) Cultural Resource Data Sharing Service (DSS).
- US Fish and Wildlife Service (USFWS) and Virginia Department of Game and Inland Fisheries (VDGIF) habitat databases.
- Aerial photography – from sites such as Pictometry which provides high resolution oblique imagery (photographs for field reviews and Pictometry are provided in Appendix A).
- Railroad Property Valuation maps.
- Coordination with VRE and Spotsylvania County staff including the January 2010 project workshop.
- GIS data provided by Spotsylvania County.
- Tax Assessment/parcel data provided by Spotsylvania County.

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<sup>4</sup> Virginia Railway Express, *Virginia Railway Express Strategic Plan 2004-2025*, May 2004, Page 85.



## 4.2 Tier II Site Descriptions

Site 1A and 6B are illustrated in Figure 2 and described in more detail in this section.

**1A – South of Mills Drive (east of tracks).** This site is located just north of the VRE layover yard in the Crossroads Industrial Park. Direct access to the site and into the commercial park is provided by Crossroads Parkway via US Route 17 Bypass (Mills Drive) and Benchmark Road. This location has excellent access to commuters using Interstate 95, located approximately 3.2 miles to the west, and US Route 17 Bypass (Mills Drive). Connections between US Route 17 Bypass (Mills Drive) and I-95 will be enhanced when a new interchange is completed. US Route 17 Bypass (Mills Drive) also has the highest functional classification of all the access roads that serve the study area, and may be able to absorb higher traffic volumes. The site is zoned for industrial/commercial development but is not currently developed (vacant). The NWI identifies a small wetland formation on the site in the northeast corner, which could be avoided.

**6B – Latimers Knoll Court (west of tracks).** This site is located on Latimers Knolls Court off Lansdowne Road at the County boundary with Fredericksburg. Roadway access ranks lower than the other two sites. Lansdowne Road does not offer a direct connection to I-95 and there is an at-grade crossing that commuters would have to use travelling west from Fredericksburg. The site is located on the west side of the tracks which may be considered a small operational disadvantage; however, the third track in the corridor is already in place at this location which is an advantage operationally. There appears to be a small wetland formation on the site according to NWI, and a small stream drainage flow was observed north of the site which empties into existing wetlands between sites 6B and 7B. About 40 percent of the site is located in the 100-year floodplain of Deep Run. The County has adopted a floodplain ordinance consistent with FEMA regulations, which could affect development on the site. The site borders the Fredericksburg and Spotsylvania National Military Park and the chance for cultural resource impacts may be greater than the site's proximity to the Park. The close proximity of this location to the existing Fredericksburg Station (1.3 miles) may also affect VRE run times/operational speeds between the two stations, i.e. trains leaving this location would need to decelerate quickly to serve Fredericksburg Station. Lastly, the site is located in a County designated "Airport Overlay District" which limits the horizontal and vertical clearance of structures within the approach of the airport.

## 4.3 Site Rankings

Rankings for the two Tier II sites are provided in **Table 4**. A qualitative, numerical ranking has been assigned to each resource to characterize the expected level of impact/cost. In this analysis, a lower score is better. The impact rankings are as follows:

- 0 = No Impact/Cost
- 1 = Low Impact/Cost
- 2 = Medium Impact/Cost
- 3 = High Impact/Cost

A qualitative score is provided at the bottom of each column for comparison purposes. Note that detailed environmental impact calculations have not been developed for this analysis. A jurisdictional determination of wetland impacts, as an example, would require wetland delineation completed in the field by qualified environmental scientists, surveys and precise impact calculations.



The Tier II Analysis qualitatively evaluated the impacts in a number of topical areas:

- **Natural Environmental Impacts:** Impacts to wetlands, and water bodies, high quality soils and habitat were evaluated.
- **Land Use /Social/Human Environmental Impacts.** Impacts to Existing land use and adjacent land uses were identified on the sites, to assess for example, potential noise, air quality and traffic impacts to residential areas that are located on or adjacent to the sites.
- **Rail Operations.** Different sites could impact the “fluidity” of trains moving through the corridor, and additional rail infrastructure and operational costs are affected by site location.
- **Transportation Impacts:** The costs for multi-modal transportation improvements including roadway, bicycle and pedestrian facilities, as well as existing transit services that could serve the station. Transportation safety was also considered on both the rail and roadway system.



**Table 4: Tier II Screening Summary and Site Comparison**

Screening Factor	Site 1A	Site 6B
<b><i>Natural Environment</i></b>		
Wetlands	1	1
Water Bodies/Rivers/Water Supply	1	1
Floodplains	0	2
Geotechnical & Slope Stability	1	1
Prime Soils/Farm Lands Taken	2	2
Threatened and Endangered Species	1	1
<b><i>Land Use/Social/Human environment</i></b>		
Existing Land Use	1	1
Adjacent Land Use	1	2
Residential Areas	1	1
Existing Infrastructure Conflicts	2	3
Noise	1	2
<b><i>Rail Operations and Flexibility</i></b>		
Physical Area of Site	2	2
Rail Corridor Disruption	1	2
Rail Delays	1	1
<b><i>Other Improvements</i></b>		
Transportation/Site Access	2	3
Pedestrian/Bicycle Facility Access	2	2
Transit Access	2	2
Number of At-Grade Crossings	0	1
Roadway Improvement Costs	2	3
<i>Unit Cost - Land Assessed Value (dollars /acre)</i>	<i>\$38,300</i>	<i>\$39,200</i>
<b>Score</b>	<b>24</b>	<b>33</b>





## 5 Concept Cost Estimate

This section provides a concept station design and phased cost estimate for Sites 1A and 6B. The capital cost includes all the price for all necessary infrastructure improvements to accommodate a commuter rail station including a station platform and canopy, and a 1,000-space surface parking lot for opening day. The design and capital cost estimate also include a future 1,000 space parking garage and 1,000 space VDOT Park & Ride lot for a total of 3,000 parking spaces which would be constructed in phases. Detailed cost estimates and station design concepts are provided in **Appendix B**.

### 5.1 Concept Station Design

The following discussion provides elements of the concept commuter rail station design. Concepts for the station are presented in **Figure 4** and **5** of Appendix B.

#### 5.1.1 Station Infrastructure

Station infrastructure includes platforms, shelters, lighting and security, pedestrian bridge, and fencing (between tracks). The station design is consistent with the VRE Station Design Guidelines.

#### 5.1.2 Passenger Platforms

Two 800-foot side platforms are proposed for construction at both station locations at full station build-out. The east side platform will be constructed during the first phase of the project. This is consistent with current VRE operations in similar areas. In the longer term, platforms constructed on the west side of the track would provide additional operational flexibility for the railroads in the corridor. For example, in the case of a train breakdown blocking one track it may be possible to move trains around it in both directions simultaneously with minimal delay and to provide platforms on both sides of the corridor. At present, when such an event occurs without the third track, major disruptions in train service occur in one or both directions on the railroad. These disruptions often lead to delays in VRE commuter and Amtrak intercity passenger train service. However, west-side platforms are not necessary in the short-term and are considered a long term goal as jurisdictions south of Spotsylvania County join VRE.

#### 5.1.3 Pedestrian Bridge

A pedestrian bridge would be needed at full station build-out to access platforms on both sides of the railroad tracks. The final station site chosen would determine the phase at which the pedestrian bridge would be built. As shown in the conceptual site plan in Appendix B, Site 6B would require the pedestrian bridge to be built during Phase 1 construction for access to the east platform from the parking lot located on the west side of the tracks. At Site 1A, a pedestrian bridge would be constructed during the phase in which the west platform is constructed. Four elevators would serve the pedestrian bridge. As stated in the last section, a platform on the west side of the tracks at Site 1A is envisioned as a long-term goal, but is not necessary in the short-term.

#### 5.1.4 Access Driveway

An access driveway would be constructed to connect an existing public road to the new station at either location. The cost to complete this connection is calculated as part of the access infrastructure inside



the station footprint. In addition to the cost of constructing the new driveway, the cost of improving the existing road is also taken into account. Sidewalks are included on both sides of the driveway.

### 5.1.5 Parking

As stated previously, 1,000 surface parking spaces would be available to the public on “opening day.” Space would be reserved at the site for an additional 1,000 surface parking spaces to be used as a future county Park & Ride lot. An area would also be reserved for the construction of a 1,000 space parking garage that would be built adjacent to the station platform. Access from the parking garage to the pedestrian bridge will be provided by way of stairs and elevators.

### 5.1.6 Environmental and Permitting

The environmental and permitting cost category includes the anticipated cost for environmental compliance work. This estimate includes the cost for the development of an Environmental Assessment (EA) to comply with the National Environmental Policy Act (NEPA). The development of an EA may include ridership forecasts, cost-benefit and traffic analysis. The preparation of environmental compliance documentation is estimated at 2.5% of the total construction cost. This estimate would vary depending on the site selected and the requirements of funding partners.

The costs for wetland mitigation are **not** included in this estimate. The cost of wetland credits is affected by real estate market conditions, demand and geographic location. A “snapshot” for the cost of wetland credits would range from \$75,000 to \$100,000 per acre for wetland credits in the Northern Virginia area. Mitigation could be at a 2:1 ratio, i.e. for every 1 acre of wetland impacted 2 acres of wetland credit would be purchased or replaced. Credits for stream channel impacts may also be required. Stream channel credits run from \$500 to \$750 per linear foot in the northern Virginia area. An accurate estimate for wetland and stream channel impacts and mitigation costs cannot be determined until wetland delineation is completed in subsequent phases of the project.

### 5.1.7 Land Acquisition

Land acquisition cost is **not** included in the construction cost estimate; however, a minimum footprint of 27 acres will be required for the full parking lot and garage build-out described previously.

### 5.1.8 Stormwater Management Facilities

Stormwater management facilities are included in the design and cost estimate. Although full build-out of the commuter rail station can be accomplished with as many as four phases, the stormwater management facility will be designed for the entire site including the future park and ride lot, parking garage, and west platform. Therefore, the construction cost for this facility is calculated in Phase 1. The cost estimate for stormwater management was generated by calculating \$450,000 for pond construction and another \$50,000 for the outfall structure, storm sewer piping to the outfall, landscaping, and wetland plantings in the aquatic bench. Therefore, the cost of the storm water management facility is a lump sum fee of \$500,000 for each alternative.



### 5.1.9 Landscaping

Spotsylvania County Ordinances<sup>5</sup> require five percent of total station parking area should be set aside for landscaping. The cost of landscaping is estimated at \$10 per square foot which includes labor, design, and materials. Items to be included will be site specific per site selections and other decision made in subsequent planning and design phases.

### 5.1.10 Utility Relocation

The potential utility relocation on the chosen site might include relocation of existing petroleum pipe line, culverts, concrete pipes and fiber optics along the CSX Right-of-Way and any other local utilities. The cost estimate for utility relocation is calculated based on available data for each site. A more accurate cost of utility relocation will be calculated once a utility survey is completed.

### 5.1.11 Management and Engineering Services

This category accounts for professional design and construction engineering services required for preparation of construction documents (i.e. plans and specifications). This category also includes construction engineering and management required for review of contractor submittals and construction inspection. The management and engineering services are calculated as 10% of the estimated construction subtotal during construction phases. Five percent is for construction and the other 5% is for design work. This estimate is based on the following items:

- Concept and Preliminary Design
- Final Design
- Construction Engineering /Management
- Owner Review
- Geotechnical Services
- Site Survey

### 5.1.12 Contingency

In an effort to account for unforeseen costs related to items such as utility relocations, excessive amounts of site work, and unknown field conditions that will be reported by future surveys and site investigations, a contingency has been factored into the cost estimate. Given the level of information and purpose of this study, a minimum construction contingency of 25% has been applied to the estimated construction costs. Contingency values are usually reduced as more information is obtained and unknown conditions are reduced through subsequent planning, surveying, and design stages. Contingency costs typically range from 5% to 12% of construction in final pre-bid estimates.

## 5.2 Cost Estimate Summary

Detailed cost estimates and phasing are provided for each alternative site in **Appendix B**. Two cost estimate scenarios are presented in Appendix B. **Table 5** provides summary cost estimate for both Site 1A and 6B site for a station build-out scenario which includes 3,000 parking spaces with a parking garage.

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<sup>5</sup> Spotsylvania County, Virginia, *Spotsylvania County Design Standards Manual*, Pg. 6-22.



**Table 5: Cost Estimate Summary**

<b>Build-out Components</b>	<b>Site 1A</b>	<b>Site 6B</b>
Station Infrastructure	\$13,326,000	\$13,326,000
Parking Infrastructure	\$35,860,000	\$35,860,000
Access Infrastructure	\$3,812,000	\$5,985,000
Sitework	\$3,379,740	\$12,846,068
Railroad Flagging / Eng. Review	\$750,000	\$750,000
<b>Subtotal</b>	<b>\$57,127,740</b>	<b>\$68,767,068</b>
Environmental and Permitting	\$1,428,200	\$1,719,175
10% Design Engineering Services	\$5,713,000	\$6,877,000
25% Contingency	\$14,282,000	\$17,192,000
<b>Estimated Total Construction Cost</b>	<b>\$78,600,000</b>	<b>\$94,600,000</b>

Note: All costs are in 2010 dollars.

The following assumptions were made in developing the cost estimates for the two alternative sites:

- The footprint of the station includes 1,000 parking spaces each for the surface lot, the Park and Ride lot, and the parking garage.
- An estimated 400 SF per parking space was used for both surface lots.
- An estimated 315 SF per parking space was used for the parking garage with four levels.

The cost estimate does **not** include:

- Right-of-Way (ROW) and property acquisition for the station.
- Any railroad improvements/track work, such as crossover installations or the construction of a third track between MP55.7 and MP53.2.
- Wetland Mitigation Costs

### 5.2.1 Phased Cost Estimate

The characteristics of each site affect construction phasing. Site 6B would be the more expensive site through Phase II because it is necessary to construct a pedestrian bridge to the east side of the tracks where a platform would be constructed. As discussed, construction of west-side platforms is a longer term goal as jurisdictions to the south join VRE. **Table 6** provides a summary of the cost estimate for each site by phase.



**Table 6: Phased Cost Estimate Summary**

Phase	Site 1A	Site 6B
Phase 1	\$19,200,000	\$36,100,000
Phase 2	\$10,600,000	\$13,800,000
Phase 3	\$35,000,000	\$35,000,000
Phase 4	\$14,800,000	\$10,100,000
<b>Estimated Total Construction Cost</b>	<b>\$78,600,000</b>	<b>\$94,600,000</b>

Section 5.3 provides more detail on construction phasing. One advantage to Site 1A is the cost-effectiveness of the first two phases which would not require the construction of a pedestrian bridge to operate trains.

### 5.3 Phasing

The major station components of the proposed commuter rail station include the east platform, surface parking, west platform, pedestrian bridge, surface Park & Ride lot, and parking garage. The modular nature of the cost estimate allows the individual components to be included in an as needed basis and as funding becomes available. Certain elements of the station facility must be constructed in Phase 1, e.g. surface parking and station platforms on the east of the tracks. Other elements of the station design could be constructed in phases depending on the location selected, and there is flexibility the five major elements of the station which is summarized in **Table 7** and Appendix B.

**Table 7: Construction Phasing Options**

Phase	Site 1A	Site 6B
Phase 1	A, B	A, B, C
Phase 2	E	E
Phase 3	F	F
Phase 4	C, D	D

Identifier	Station Facility Element
A	East Station Platform
B	Surface Parking
C	Pedestrian Bridge
D	West Station Platform
E	Surface Park and Ride
F	Parking Garage

#### 5.3.1 Site 1A

The only sequencing requirement for Site 1A is that the east platform and surface parking area be constructed during Phase 1 of the project. All other items can be constructed in any of four possible construction phases or combination thereof based on funding availability.



### 5.3.2 Site 6B

Since Site 6B is located on the west side of the CSX tracks, a pedestrian would have to be constructed in the first phase. The east platform, surface parking, and pedestrian bridge would all be constructed in Phase 1. However, Site 6B sits at a low elevation and with nearby water bodies flooding may be an issue. To resolve this issue, the construction of a 12' x 6' concrete box culvert for Deep Run will be needed during Phase 1. This culvert will act as an access bridge for the site. The other major station components which include the west platform, surface parking, the park & ride lot, and parking garage can all be phased and completed in any order or combination chosen based on available funding.

## 5.4 Cost Assumptions

### 5.4.1 Site 1A

The total cost for construction build-out of all phases outlined above at Site 1A is \$78,600,000. Site work at Site 1A is minimal with minor clearing and grubbing, excavation and grading work. The need for borrowed fill is anticipated at the site. Other site specific assumptions for Site 1A include:

- Relocating and/or protecting existing utilities along the railroad Right-of-Way prior to construction.
- Adding a new traffic signal at US Route 17 Bypass (Mills Drive) and Crossroads Parkway.
- Construction of a 600 linear feet of driveway access from existing roadway to station:
  - 0' width
  - Sidewalks on both sides (5' wide)
- Construction of Kiss & Ride Lot / Bus Loop (3,800 linear feet):
  - 20' width wide
  - 40' width between surface parking and Park & Ride lot
  - Sidewalks both sides of the road(5'wide)
- Construction of Parking Lot Perimeter Circulation:
  - 2,500 linear feet (20' wide)
  - Sidewalk on one side of the road (5'wide)

### 5.4.2 Site 6B

The total cost for Site 6B is \$94,600,000. The cost estimate includes:

- Relocating and/or protecting existing utilities along the railroad Right-of-Way prior to construction of the station.
- Improving approximately 1,280 linear feet of existing roadway along Latimers Knoll Court to connect Lansdowne Road to the station.
- Construction of a 600 linear feet of driveway access from existing roadway to station:
  - 40' width
  - Sidewalks on both sides (5' wide)
- Construction of Kiss & Ride Lot // Bus Loop (3800 linear feet):
  - 20' width
  - 40' width between surface parking and Park & Ride lot
  - Sidewalks both sides of the road(5'wide)
- Construction of Parking Lot Perimeter Circulation:



- 2500 linear feet (20' wide)
- Sidewalk on one side of the road (5' wide)
- Construction of 6'x12' concrete culverts at Deep Run Creek (48 linear feet) that is 40' wide.



## 6 Findings and Recommendations

Of the Fourteen (14) sites analyzed, only Site 1A appears to be viable. Further analysis will be needed and recommendations are discussed in more detail in this section. **Site 1A ranked highest in this initial assessment.** Site 1A is the preferred alternative for several reasons. The site is consistent with previous VRE recommendations for a Spotsylvania County station location, appears to have limited natural/environmental impacts, and is located in an industrial zone. As mentioned, commuter access via I-95 and US Route 17 Bypass (Mills Drive) is excellent relative to the other locations (Sites 3 through 7). The site is located on the east side of the rail corridor and just north of the lead track into the VRE layover yard, two factors which would benefit VRE operations.

Although Site 1A appears to have the least impacts, across the tracks, Site 1B is a historic property (LaVue House) which is listed in the National Register of Historic Places as described in Section 2.3. Impacts to the historic property are likely to initiate compliance with Section 106 of the National Historic Preservation Act and review by the Virginia Department of Historic Resources. Site 1B is residential private property as well and does not currently have compatible zoning.

### 6.1 Future Studies

Future environmental compliance requirements will be determined by both the funding and regulatory agencies at the local, state and federal level. Future studies may include analyses of traffic impacts or wetland impacts as an example. Improvements for pedestrians, bicyclists and transit may be evaluated in the next phases of design and planning.





## **Appendix A: Site Photos**



1: Site 1A Facing East



2: Site 1A Facing North



3: Site 2A Facing East



4: Site 2A Facing North



5: Site 2B Facing East



6: Site 2B Facing North



7: Site 6B Facing East



8: Site 6B Facing West



## **Appendix B: Cost Estimate Data and Figures**

### **List of Tables**

Summary Cost Estimate Phases

Table B1: Site 1A Cost Estimate

Table B2: Site 6B Cost Estimate

### **List of Figures**

Figure 4: Conceptual Station Layout (General Plan)

Figure 5: Conceptual Station Plan and Elevation

# Virginia Railway Express Commuter Rail Station

Spotsylvania County, VA

## Summary of Estimated Construction Cost

8/3/2010

SUMMARY OF ESTIMATED CONSTRUCTION COST FOR PHASE 1		
Build-out Components	Site 1A	Site 6B
Station Infrastructure	\$3,917,000	\$10,017,000
Parking Infrastructure (Surface Parking)	\$5,304,000	\$5,304,000
Access Infrastructure	\$2,855,000	\$5,028,000
Sitework	\$1,586,000	\$5,820,000
Railroad Flagging / Eng. Review	\$250,000	\$250,000
<b>Subtotal</b>	<b>\$13,912,000</b>	<b>\$26,419,000</b>
Environmental and Permitting	\$360,000	\$430,000
10% Design Engineering Services	\$1,391,000	\$2,642,000
25% Contingency	\$3,478,000	\$6,605,000
<b>Estimated Total Construction Cost</b>	<b>\$19,200,000</b>	<b>\$36,100,000</b>

SUMMARY OF ESTIMATED CONSTRUCTION COST FOR PHASE 2		
Build-out Components	Site 1A	Site 6B
Parking Infrastructure (Park and Ride)	\$5,448,000	\$5,448,000
Access Infrastructure	\$957,000	\$957,000
Sitework	\$1,155,190	\$3,471,210
<b>Subtotal</b>	<b>\$7,560,190</b>	<b>\$9,876,210</b>
Environmental and Permitting	\$360,000	\$430,000
10% Design Engineering Services	\$756,000	\$988,000
25% Contingency	\$1,890,000	\$2,469,000
<b>Estimated Total Construction Cost</b>	<b>\$10,600,000</b>	<b>\$13,800,000</b>

SUMMARY OF ESTIMATED CONSTRUCTION COST FOR PHASE 3		
Build-out Components	Site 1A	Site 6B
Parking Infrastructure (Garage)	\$25,108,000	\$25,108,000
Railroad Flagging / Eng. Review	\$250,000	\$250,000
<b>Subtotal</b>	<b>\$25,358,000</b>	<b>\$25,358,000</b>
Environmental and Permitting	\$360,000	\$430,000
10% Design Engineering Services	\$2,536,000	\$2,536,000
25% Contingency	\$6,340,000	\$6,340,000
<b>Estimated Total Construction Cost</b>	<b>\$35,000,000</b>	<b>\$35,000,000</b>

SUMMARY OF ESTIMATED CONSTRUCTION COST FOR PHASE 4		
Build-out Components	Site 1A	Site 6B
Station Infrastructure	\$9,409,000	\$3,309,000
Sitework	\$638,550	\$3,554,858
Railroad Flagging / Eng. Review	\$250,000	\$250,000
<b>Subtotal</b>	<b>\$10,297,550</b>	<b>\$7,113,858</b>
Environmental and Permitting	\$360,000	\$430,000
10% Design Engineering Services	\$1,030,000	\$711,000
25% Contingency	\$2,574,000	\$1,778,000
<b>Estimated Total Construction Cost</b>	<b>\$14,300,000</b>	<b>\$10,100,000</b>

SUMMARY OF TOTAL ESTIMATED CONSTRUCTION COST		
Build-out Components	Site 1A	Site 6B
Station Infrastructure	\$13,326,000	\$13,326,000
Parking Infrastructure	\$35,860,000	\$35,860,000
Access Infrastructure	\$3,812,000	\$5,985,000
Sitework	\$3,379,740	\$12,846,068
Railroad Flagging / Eng. Review	\$750,000	\$750,000
<b>Subtotal</b>	<b>\$57,127,740</b>	<b>\$68,767,068</b>
Environmental and Permitting	\$1,428,200	\$1,719,175
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<b>Estimated Total Construction Cost</b>	<b>\$78,600,000</b>	<b>\$94,600,000</b>

PHASING OPTIONS		
	Site 1A	Site 6B
Phase 1	A, B	A, B, C
Phase 2	E	E
Phase 3	F	F
Phase 4	C, D	D

A	East Station Platform
B	Surface Parking
C	Pedestrian Bridge
D	West Station Platform
E	Surface Park and Ride
F	Parking Garage

Note: Construction Cost estimates are in 2010 dollars. Allow 5% increase in cost per year for inflation if construction occurs at a later year.

**Virginia Railway Express Commuter Rail Station**  
**Spotsylvania County, VA**  
8/03/2010

**Table B1: Estimated Construction Cost for Site 1A**

Proposed VRE Build-Out					
VRE PROPOSED BUILD-OUT (PHASE 1)					
Line	Item	Quantity	Units	Unit Cost	Total Cost
<b>Station Infrastructure</b>					
1	Platform	12,800	SF	\$200	\$2,560,000
2	Canopy	400	LF	\$2,000	\$800,000
3	Headhouse	630	SF	\$175	\$110,000
4	ADA Ramps	200	LF	\$580	\$116,000
5	Lighting	12,800	SF	\$20	\$256,000
6	Security (Cameras, Call Boxes, etc.)	1	LS	\$75,000	\$75,000
<b>Station Subtotal</b>					<b>\$3,917,000</b>
<b>Parking Infrastructure</b>					
7	Asphalt Surface Parking Lot	1,000	Prkg. Spa.	\$5,000	\$5,000,000
8	Light Poles	38	EA	\$8,000	\$304,000
<b>Parking Subtotal</b>					<b>\$5,304,000</b>
<b>Access Infrastructure</b>					
9	Station Access Driveway	24,000	SF	\$15	\$360,000
10	Access Driveway Sidewalk	1,200	LF	\$90	\$108,000
11	Parking Lot/Kiss and Ride/ Bus Loop	109,000	SF	\$15	\$1,635,000
12	Station / Parking Lot Sidewalk	2,300	LF	\$90	\$207,000
13	Existing Roadway Improvements	46,000	SF	\$8	\$345,000
14	New Traffic Signal	1	EA	\$200,000	\$200,000
<b>Roadway Subtotal</b>					<b>\$2,855,000</b>
<b>Sitework</b>					
15	Clear and Grub (Low)	16.5	AC	\$9,340	\$154,110
16	Excavation	32,500	CY	\$20	\$650,000
17	Borrowed Fill	6,500	CY	\$25	\$162,500
18	Site Grading	702,000	SF	\$0.54	\$379,080
19	Landscaping	24,000	SF	\$10	\$240,000
20	Stormwater Management System	27	AC	\$19,000	\$500,000
21	Utility Relocation	1	LS	\$135,000	\$135,000
<b>Sitework Subtotal</b>					<b>\$1,586,000</b>
22	Railroad Flagging / Eng. Review	1	LS	\$250,000	\$250,000
<b>Phase 1 Subtotal</b>					<b>\$13,912,000</b>
Environmental and Permitting <sup>4</sup>					\$360,000
10% Design Engineering Services					\$1,391,000
25% Contingency					\$3,478,000
<b>Phase 1 Total</b>					<b>\$19,141,000</b>
<b>SAY</b>					<b>\$19,200,000</b>

VRE PROPOSED BUILD-OUT (PHASE 2)					
Line	Item	Quantity	Units	Unit Cost	Total Cost
<b>Parking Infrastructure</b>					
1	Park and Ride Surface Parking	1,000	Prkg. Spa.	\$5,000	\$5,000,000
2	Light Poles	38	EA	\$8,000	\$304,000
3	Sidewalks	1,600	LF	\$90	\$144,000
<b>Parking Subtotal</b>					<b>\$5,448,000</b>
<b>Access Infrastructure</b>					
4	Parking Lot Roadway	53,000	SF	\$15	\$795,000
5	Parking Lot Sidewalk	1,800	LF	\$90	\$162,000
<b>Roadway Subtotal</b>					<b>\$957,000</b>
<b>Sitework</b>					
6	Clear and Grub (Low)	10.5	AC	\$9,340	\$98,070
7	Excavation	32,500	CY	\$20	\$650,000
8	Borrowed Fill	6,500	CY	\$25	\$162,500
9	Site Grading	453,000	SF	\$0.54	\$244,620
<b>Parking Subtotal</b>					<b>\$1,155,190</b>
<b>Phase 3 Subtotal</b>					<b>\$7,560,000</b>
Environmental and Permitting <sup>4</sup>					\$360,000
10% Design Engineering Services					\$756,000
25% Contingency					\$1,890,000
<b>Phase 2 Total</b>					<b>\$10,566,000</b>
<b>SAY</b>					<b>\$10,600,000</b>

Assumptions	
1	The east platform will be constructed first
2	ROW and property acquisition is not included in the cost estimate
3	Access driveway construction starts from the existing public road and includes Kiss and Ride/Bus Loop
4	The total environmental and permitting The total environmental and permitting cost (2.5% of the sum of the subtotal of Phases 1 and 2) was divided evenly between Phases 1 and 2.
5	Wetland mitigation not included
6	The footprint of the station includes 1000 parking spaces each for the surface lot, the Park and Ride lot, and the parking garage
7	An estimated 400 SF per parking was used for both surface lots
8	An estimated 315 SF per parking was used for the parking garage with four levels
9	Spotsylvania County Design Standards require 5 percent of the impervious surface of a parking lot to be

**Note:** Construction Cost estimates are in 2010 dollars. Allow 5% increase in cost per year for inflation if construction occurs at a later year.



Virginia Railway Express Commuter Rail Station  
Spotsylvania County, VA  
8/03/2010

**Table B1: Estimated Construction Cost for Site 1A**

VRE PROPOSED BUILD-OUT (PHASE 3)					
Line	Item	Quantity	Units	Unit Cost	Total Cost
<b>Parking Infrastructure</b>					
1	Parking Garage	1,000	Prkg. Spa.	\$25,000	\$25,000,000
2	Sidewalks	1,200	LF	\$90	\$108,000
<b>Parking Subtotal</b>					<b>\$25,108,000</b>
3	Railroad Flagging / Eng. Review	1	LS	\$250,000	\$250,000
<b>Phase 4 Subtotal</b>					<b>\$25,358,000</b>
Environmental and Permitting <sup>4</sup>					\$360,000
10% Design Engineering Services					\$2,536,000
25% Contingency					\$6,340,000
<b>Phase 3 Total</b>					<b>\$34,594,000</b>
<b>SAY</b>					<b>\$35,000,000</b>

Site Specific Cost Impacts	Quantity	Unit	Unit Cost	Total Cost
Utility Relocation	1	LS	\$135,000	\$135,000
Station Access Driveway	24,000	SF	\$15	\$360,000
Access Driveway Sidewalks	1,200	SF	\$90	\$108,000
Existing Roadway Improvements	46,000	SF	\$8	\$345,000
<b>Subtotal</b>				<b>\$948,000</b>
Clear and Grub	27.0	AC	\$9,340	\$252,180
Borrowed Fill	13,000	CY	\$25	\$325,000
Excavation	66,600	CY	20	\$1,332,000
Grading	1,177,000	SF	0.54	\$635,580
New Traffic Signal	1	EA	\$200,000	\$200,000
<b>Subtotal</b>				<b>\$2,744,760</b>
<b>Site Specific Cost Impacts Total</b>				<b>\$3,693,000</b>

VRE PROPOSED BUILD-OUT (PHASE 4)					
Line	Item	Quantity	Units	Unit Cost	Total Cost
<b>Station Infrastructure</b>					
1	Platform	12,800	SF	\$200	\$2,560,000
2	Pedestrian Bridge	1	LS	\$6,100,000	\$6,100,000
3	Canopy	200	LF	\$2,000	\$400,000
4	Lighting	12,800	SF	\$20	\$256,000
5	Security	1	LS	\$75,000	\$75,000
6	Fencing (between tracks)	800	LF	\$22	\$18,000
<b>Station Subtotal</b>					<b>\$9,409,000</b>
<b>Sitework</b>					
7	Clear and Grub (Low)	0.5	AC	\$9,340	\$4,670
8	Excavation	1,600	CY	\$20	\$32,000
9	Borrowed Fill	0	CY	\$25	\$0
10	Site Grading	22,000	SF	\$0.54	\$11,880
11	Landscaping <sup>9</sup>	59,000	SF	\$10	\$590,000
<b>Sitework Subtotal</b>					<b>\$638,550</b>
12	Railroad Flagging / Eng. Review	1	LS	\$250,000	\$250,000
<b>Phase 2 Subtotal</b>					<b>\$10,298,000</b>
Environmental and Permitting <sup>4</sup>					\$360,000
10% Design Engineering Services					\$1,030,000
25% Contingency					\$2,575,000
<b>Phase 4 Total</b>					<b>\$14,263,000</b>
<b>SAY</b>					<b>\$14,300,000</b>
<b>TOTAL ESTIMATED CONSTRUCTION COST</b>					<b>\$78,600,000</b>

Virginia Railway Express Commuter Rail Station  
Spotsylvania County, VA  
8/03/2010

**Table B2: Estimated Construction Cost for Site 6B**

VRE PROPOSED BUILD-OUT (PHASE 1)					
Line	Item	Quantity	Units	Unit Cost	Total Cost
<b>Station Infrastructure</b>					
1	Platform	12,800	SF	\$200	\$2,560,000
2	Canopy	400	LF	\$2,000	\$800,000
3	Headhouse	630	SF	\$175	\$110,000
4	Pedestrian Bridge	1	LS	\$6,100,000	\$6,100,000
5	ADA Ramps	200	LF	\$580	\$116,000
6	Lighting	12,800	SF	\$20	\$256,000
7	Security (Cameras, Call Boxes, etc.)	1	LS	\$75,000	\$75,000
<b>Station Subtotal</b>					<b>\$10,017,000</b>
<b>Parking Infrastructure</b>					
8	Asphalt Surface Parking Lot	1,000	Prkg. Spa.	\$5,000	\$5,000,000
9	Light Poles	38	EA	\$8,000	\$304,000
<b>Parking Subtotal</b>					<b>\$5,304,000</b>
<b>Access Infrastructure</b>					
10	Station Access Driveway	48,000	SF	\$15	\$720,000
11	Access Driveway Sidewalk	2,400	LF	\$90	\$216,000
12	Parking Lot/Kiss and Ride/ Bus	109,000	SF	\$15	\$1,635,000
13	Station / Parking Lot Sidewalk	2,600	LF	\$90	\$234,000
14	Existing Roadway Improvements	26,000	SF	\$14	\$351,000
15	12' x 6' Box Culvert	1	LS	\$1,872,000	\$1,872,000
<b>Roadway Subtotal</b>					<b>\$5,028,000</b>
<b>Sitework</b>					
16	Clear and Grub (Heavy)	16.5	AC	\$12,315	\$203,198
17	Excavation	139,000	CY	\$20	\$2,780,000
18	Borrowed Fill	52,000	CY	\$25	\$1,300,000
19	Site Grading	702,000	SF	\$0.85	\$596,700
20	Landscaping	24,000	SF	\$10	\$240,000
21	Stormwater Management System	27	AC	\$19,000	\$500,000
22	Utility Relocation	1	LS	\$200,000	\$200,000
<b>Sitework Subtotal</b>					<b>\$5,820,000</b>
23	Railroad Flagging / Eng. Review	1	LS	\$250,000	\$250,000
<b>Phase 1 Subtotal</b>					<b>\$26,419,000</b>
Environmental and Permitting <sup>4</sup>					\$430,000
10% Design Engineering Services					\$2,642,000
25% Contingency					\$6,605,000
<b>Phase 1 Total</b>					<b>\$36,096,000</b>
<b>SAY</b>					<b>\$36,100,000</b>

VRE PROPOSED BUILD-OUT (PHASE 2)					
Line	Item	Quantity	Units	Unit Cost	Total Cost
<b>Parking Infrastructure</b>					
1	Park and Ride Surface Parking	1,000	Prkg. Spa.	\$5,000	\$5,000,000
2	Light Poles	38	EA	\$8,000	\$304,000
3	Sidewalks	1,600	LF	\$90	\$144,000
<b>Parking Subtotal</b>					<b>\$5,448,000</b>
<b>Access Infrastructure</b>					
4	Parking Lot Roadway	53,000	SF	\$15	\$795,000
5	Parking Lot Sidewalk	1,800	LF	\$90	\$162,000
<b>Roadway Subtotal</b>					<b>\$957,000</b>
<b>Sitework</b>					
6	Clear and Grub (Very Heavy)	10.5	AC	\$13,920	\$146,160
7	Excavation	82,000	CY	\$20	\$1,640,000
8	Borrowed Fill	52,000	CY	\$25	\$1,300,000
9	Site Grading	453,000	SF	\$0.85	\$385,050
<b>Sitework Subtotal</b>					<b>\$3,471,210</b>
<b>Phase 2 Subtotal</b>					<b>\$9,876,000</b>
Environmental and Permitting <sup>4</sup>					\$430,000
10% Design Engineering Services					\$988,000
25% Contingency					\$2,469,000
<b>Phase 3 Total</b>					<b>\$13,763,000</b>
<b>SAY</b>					<b>\$13,800,000</b>

Assumptions	
1	The east platform will be constructed first
2	ROW and property acquisition is not included in the cost estimate
3	Access driveway construction starts from the existing public road and includes Kiss and Ride/Bus Loop
4	The total environmental and permitting The total environmental and permitting cost (2.5% of the sum of the subtotal of Phases 1 and 2) was divided evenly between Phases 1 and 2
5	Wetland mitigation not included
6	The footprint of the station includes 1000 parking spaces each for the surface lot, the Park and Ride lot, and the parking garage
7	An estimated 400 SF per parking was used for both surface lots
8	An estimated 315 SF per parking was used for the parking garage with four levels
9	Spotsylvania County Design Standards require 5 percent of the impervious surface of a parking lot to be

Note: Construction Cost estimates are in 2010 dollars. Allow 5% increase in cost per year for inflation if construction occurs at a later year.

(See Phases 2, 3, and 4 on Page 5)

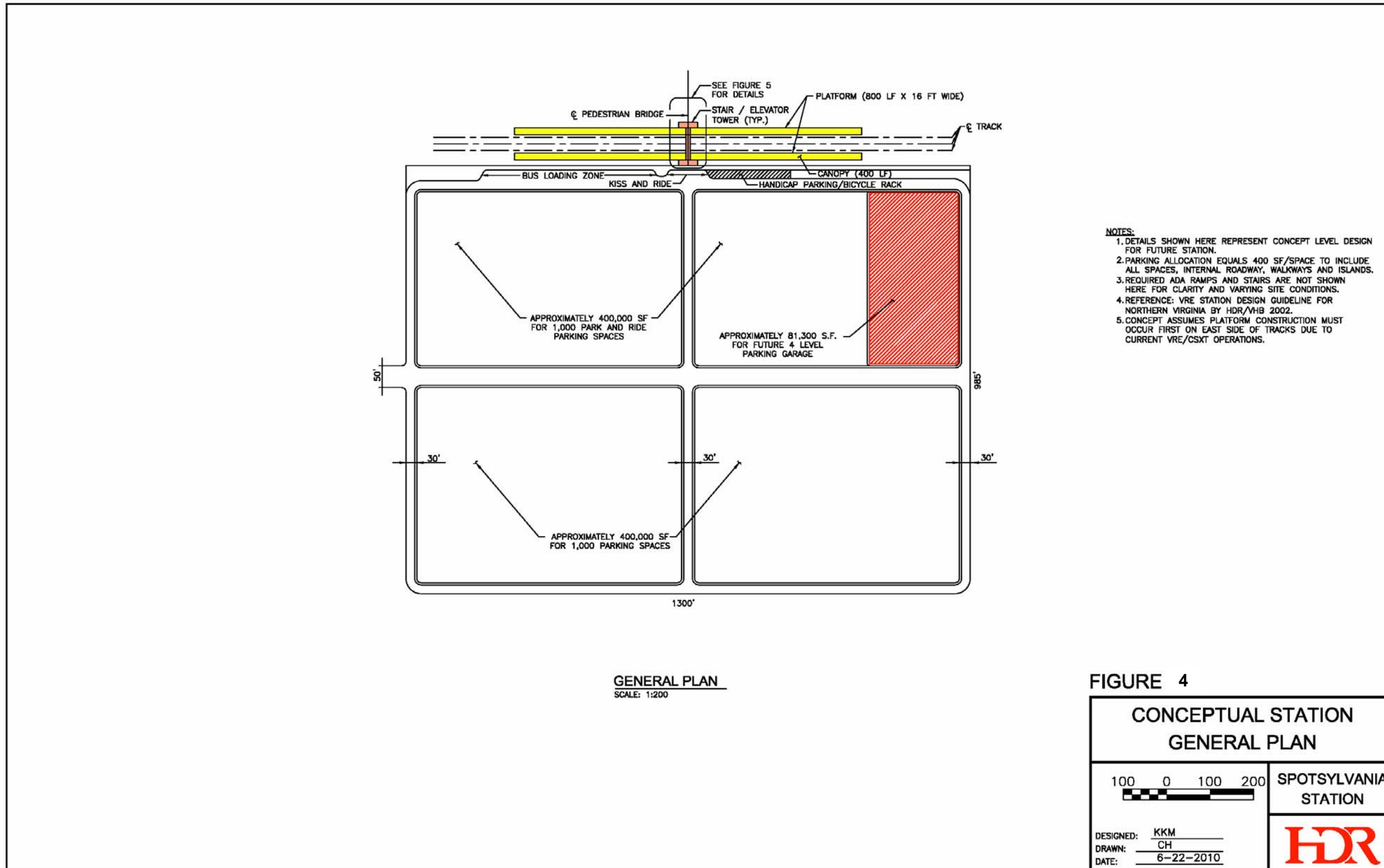
**Table B2: Estimated Construction Cost for Site 6B**

Estimated Construction Cost Per VRE Proposed Build-Out

VRE PROPOSED BUILD-OUT (PHASE 3)					
Line	Item	Quantity	Units	Unit Cost	Total Cost
<b>Parking Infrastructure</b>					
1	Parking Garage	1,000	Prkg. Spa.	\$25,000	\$25,000,000
2	Sidewalks	1,200	LF	\$90	\$108,000
<b>Parking Subtotal</b>					<b>\$25,108,000</b>
3	Railroad Flagging / Eng. Review	1	LS	\$250,000	\$250,000
<b>Phase 4 Subtotal</b>					<b>\$25,358,000</b>
Environmental and Permitting <sup>4</sup>					\$430,000
10% Design Engineering Services					\$2,536,000
25% Contingency					\$6,340,000
<b>Phase 4 Total</b>					<b>\$34,664,000</b>
<b>SAY</b>					<b>\$35,000,000</b>

Site Specific Cost Impacts	Quantity	Unit	Unit Cost	Total Cost
Utility Relocation	1	LS	\$200,000	\$200,000
Station Access Driveway	48,000	SF	\$15	\$720,000
Access Driveway Sidewalks	2,400	SF	\$90	\$216,000
Existing Roadway Improvements	26,000	SF	\$14	\$351,000
				<b>\$1,487,000</b>
Clear and Grub	27.5	AC	\$13,890	\$381,983
Borrowed Fill	806,000	CY	\$25	\$20,150,000
Excavation	216,000	CY	20	\$4,320,000
Grading	499,000	SF	0.85	\$424,150
12' x 6' Concrete Box Culvert	1	LS	\$1,872,000	\$1,872,000
				<b>\$27,148,133</b>
<b>Site Specific Cost Impacts Total</b>				<b>\$28,635,000</b>

VRE PROPOSED BUILD-OUT (PHASE 4)					
Line	Item	Quantity	Units	Unit Cost	Total Cost
<b>Station Infrastructure</b>					
1	Platform	12,800	SF	\$200	\$2,560,000
2	Canopy	200	LF	\$2,000	\$400,000
3	Lighting	12,800	SF	\$20	\$256,000
4	Security	1	LS	\$75,000	\$75,000
5	Fencing (between tracks)	800	LF	\$22	\$18,000
<b>Station Subtotal</b>					<b>\$3,309,000</b>
<b>Sitework</b>					
6	Clear and Grub (Moderate)	0.5	AC	\$12,315	\$6,158
7	Excavation	82,000	CY	\$20	\$1,640,000
8	Borrowed Fill	52,000	CY	\$25	\$1,300,000
9	Site Grading	22,000	SF	\$0.85	\$18,700
10	Landscaping <sup>9</sup>	59,000	SF	\$10	\$590,000
<b>Sitework Subtotal</b>					<b>\$3,554,858</b>
10	Railroad Flagging / Eng. Review	1	LS	\$250,000	\$250,000
<b>Phase 2 Subtotal</b>					<b>\$7,114,000</b>
Environmental and Permitting <sup>4</sup>					\$430,000
10% Design Engineering Services					\$711,000
25% Contingency					\$1,779,000
<b>Phase 2 Total</b>					<b>\$10,034,000</b>
<b>SAY</b>					<b>\$10,100,000</b>
<b>TOTAL ESTIMATED CONSTRUCTION COST</b>					<b>\$94,600,000</b>



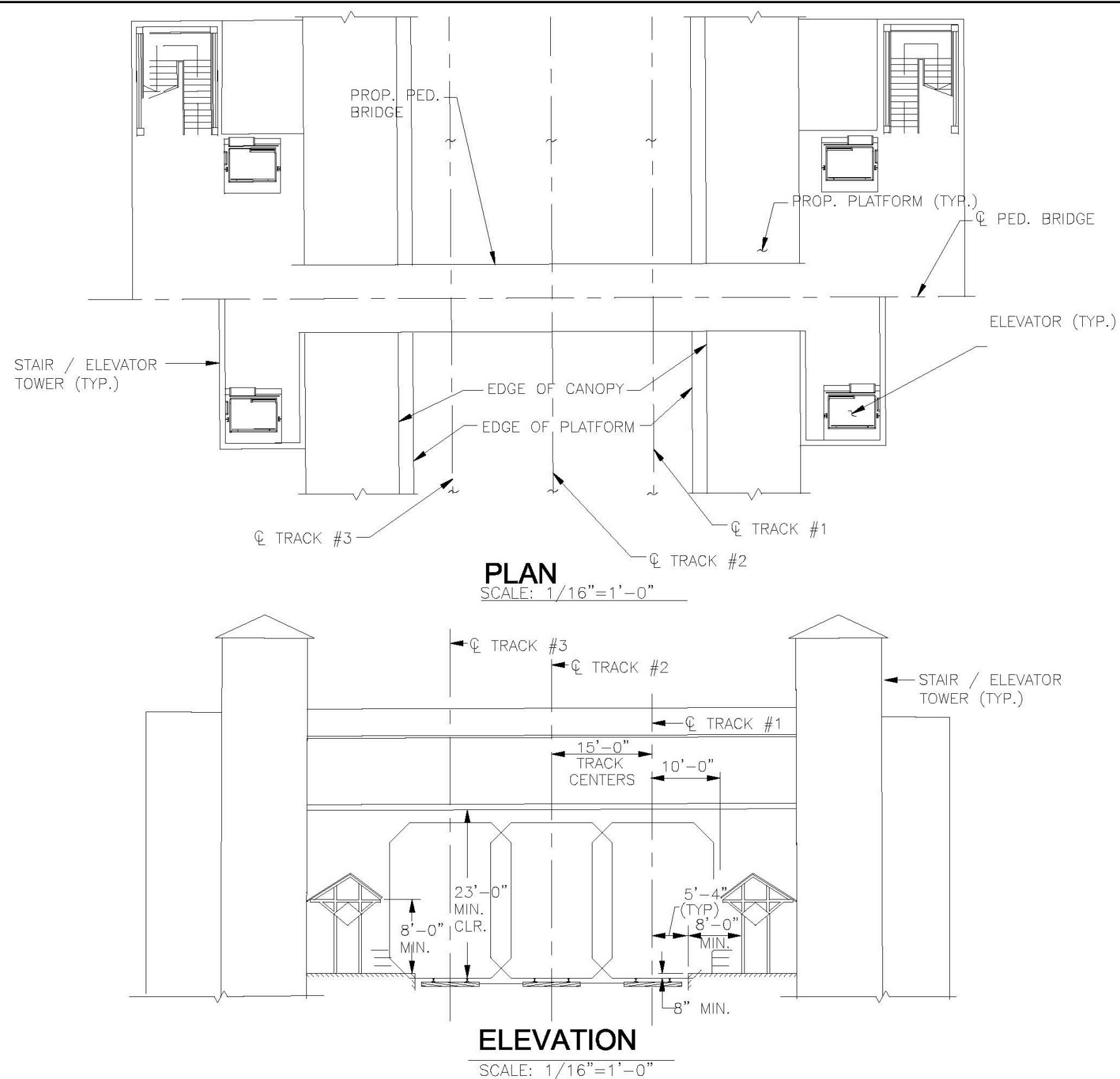


FIGURE 5

CONCEPTUAL STATION  
PLAN AND ELEVATION



SPOTSYLVANIA  
STATION

DESIGNED: DDR  
DRAWN: LNM  
DATE: 6-4-2010

