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ALTERNATIVES

A wide range of improvement alternatives was considered for this study. The alternatives were identified and evaluated through an iterative screening process in cooperation with citizens, localities, and State and Federal agencies. Except for the No-Action Alternative, alternatives deemed not reasonably capable of meeting the identified needs for the study were eliminated from further consideration. While required by National Environmental Policy Act regulations, the No-Action Alternative was also studied in detail because it serves as a baseline for comparing the other alternatives. Alternatives that were deemed too disruptive in comparison to the transportation benefits they would provide and when compared with other remaining alternatives were also eliminated from further consideration. Thus, the range of alternatives considered in detail in this document encompasses the No-Action Alternative, and various build alternatives. The following sections summarize the alternatives development process, identify the alternatives eliminated from consideration, and describe the alternatives studied in detail, and provide an operational analysis of the alternatives. The alternatives considered in detail are the No-Action Alternative (roads would remain open in the Park), Candidate Build Alternatives A-D (located north of the Park), and Candidate Build Alternative G (located south of the Park).

2.1 ALTERNATIVES DEVELOPMENT PROCESS

The intent of the alternatives development process is to develop a full range of alternatives that best serve the study's Purpose and Need, narrow the options to a set of Candidate Build Alternatives, and then analyze these Candidate Build Alternatives in the DEIS in order to identify a Preferred Alternative. The process used for the identification of alternatives was an iterative one that included several levels of analysis. To develop potential alternatives, the Study Team took a number of issues into consideration. First, the existing Federal legislation clearly states that the Purpose and Need of this effort is to close Routes 29 and 234 through the Park and relocate them 'in or in the vicinity of' The Park. Next, the Study Team considered concepts from the Virginia Department of Transportation's (VDOT) three recent studies of transportation improvements in the study area: the *I-66 Major Investment Study*, the *Route 29 Corridor Development Study*, and the *Route 234 Bypass Study*. Finally, the Study Team developed additional concepts. Combined, those initial concepts from the previous studies and those initial concepts developed by the study team became the master list of Preliminary Concepts. These Preliminary Concepts were analyzed, screened and refined into the set of five Candidate Build Alternatives. In this chapter we will discuss in detail how the set of Candidate Build Alternatives that we are carrying forward was developed.

2.1.1 Refinement of Concepts from Previous Studies

The first step in the alternatives analysis process was to develop a master list of initial concepts from previous studies. The initial set of concepts came from VDOT's three recent studies of transportation improvements in the study area: the *I-66 Major Investment Study*, the *Route 29 Corridor Development Study*, and the *Route 234 Bypass Study*. Although these studies were not developed to meet the specific Purpose and Need included in this DEIS, each study identified and evaluated a number of routes, or strategies, for relocating either Route 29 or Route 234 from within the boundaries of the Manassas National Battlefield Park.

The routes included in these previous studies were used as a starting point for the development of concepts that meet this study's Purpose and Need. Several general principles guided the identification of the Preliminary Concepts. First, concepts that did not allow for the closure of Routes 234 and 29 within the Park were not evaluated. Several concepts that involved making improvements within the Park to better manage traffic were suggested, such as widening the routes, implementing traffic calming techniques, or restricting certain types of traffic like truck traffic. These concepts were not evaluated due to their inconsistency with the fundamental purpose of the study, which is to develop alternatives that would allow for closure of both Routes 29 and 234. Second, concepts were developed that allowed for closure of both Routes 29 and 234. In order to meet the legislative intent for this study, concepts were not developed that focused on one route versus the other. Thus, concepts were developed in conjunction with each other to provide for all movements on Routes 29 and 234. Third, all concepts developed allowed for system continuity for Routes 29 and 234. Concepts that did not allow for a continuous route or continuous routes were not considered.

VDOT completed an FEIS for the potential construction of the Route 234 Bypass, although improvements to the section north of I-66 that would provide for the relocation of Route 234 from within the Park boundaries were deferred due to a lack of funding. The routes analyzed in the *Route 234 FEIS* are shown in **Figure 2-1** and were incorporated into this DEIS, primarily as part of the development of Concept 1 (see page 2-12). These concepts could serve as the relocation option for Route 234, but also potentially as a segment of a relocation alternative for Route 29, defined as Concept 2.

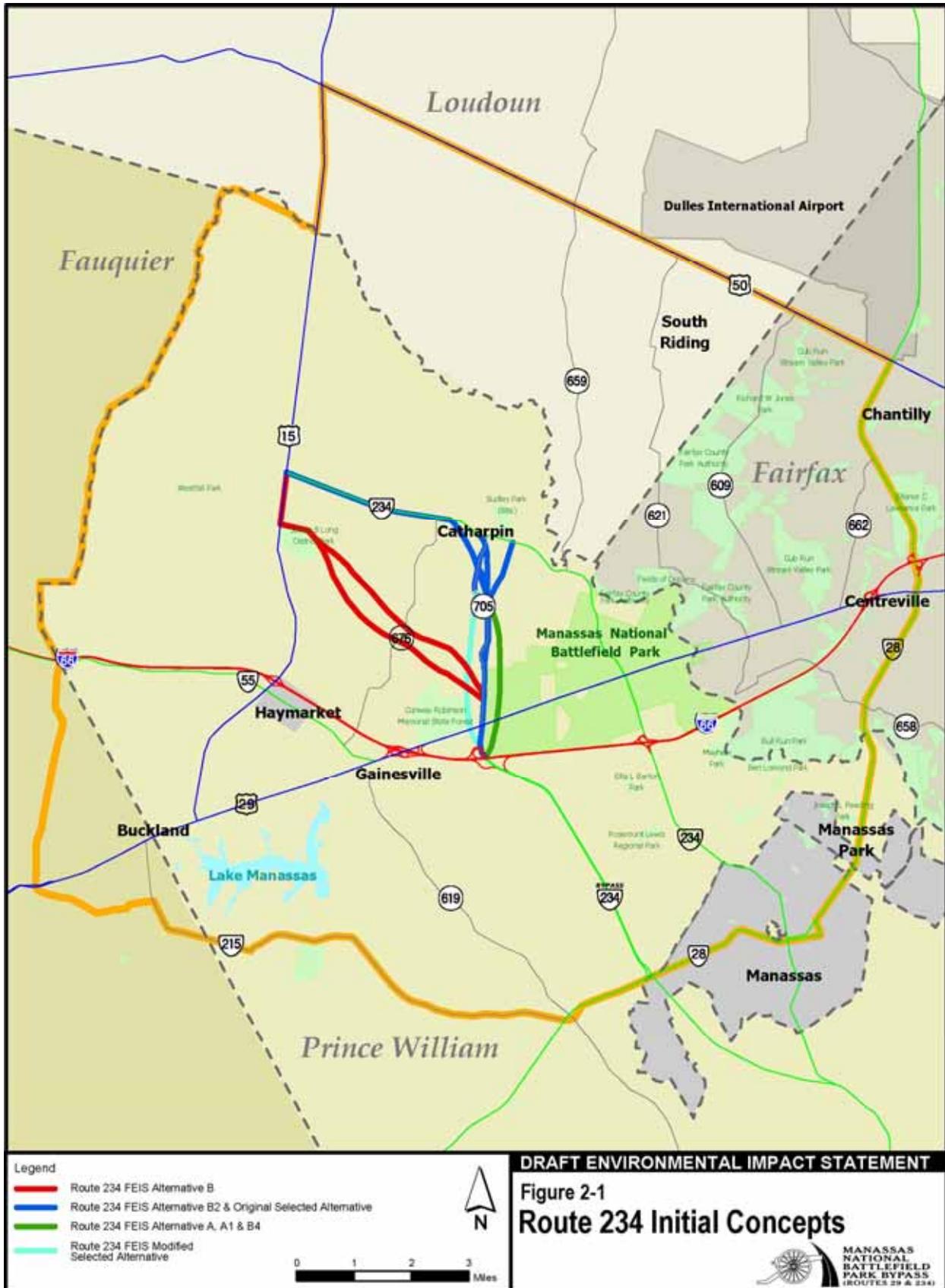
The *I-66 Major Investment Study (MIS)* was completed in 1999 and included improvement options for the I-66 corridor. The primary portion of I-66 analyzed for improvements within this study area includes the segment from Centreville to US Route 15 in the vicinity of Haymarket. The MIS identified six primary improvement alternatives that included a variety of transit and roadway configurations. These improvements are included in this DEIS since one potential re-location alternative for US Route 29 that has been studied by VDOT would be on I-66. The I-66 improvement strategies as defined in the MIS (which are currently being re-evaluated) are incorporated into either the evaluation of transit improvements for this DEIS or as part of any concept that would involve designating US Route 29 onto I-66, known as Concept 3.

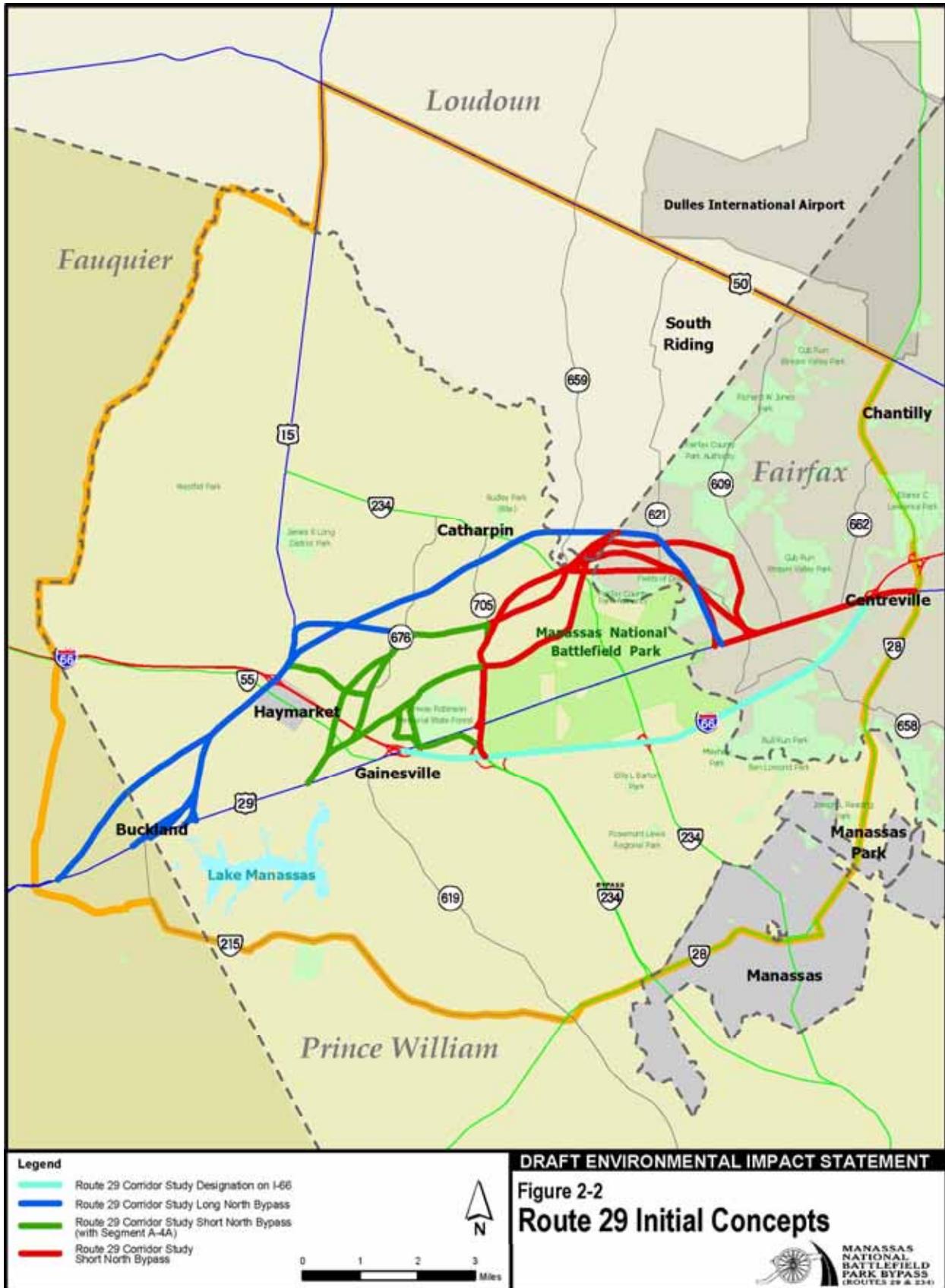
VDOT also studied potential relocation routes for *US Route 29 Corridor Development Study*. Three primary options, which were analyzed as potential relocations, were used in this DEIS and are shown in **Figure 2-2**. These options included a Route 29 Long North Bypass, a Route 29 Short North Bypass, and a Route 29 Designation on I-66. These initial options were refined and incorporated into this DEIS as part of the development of Preliminary Concepts 2, 3, and 5.

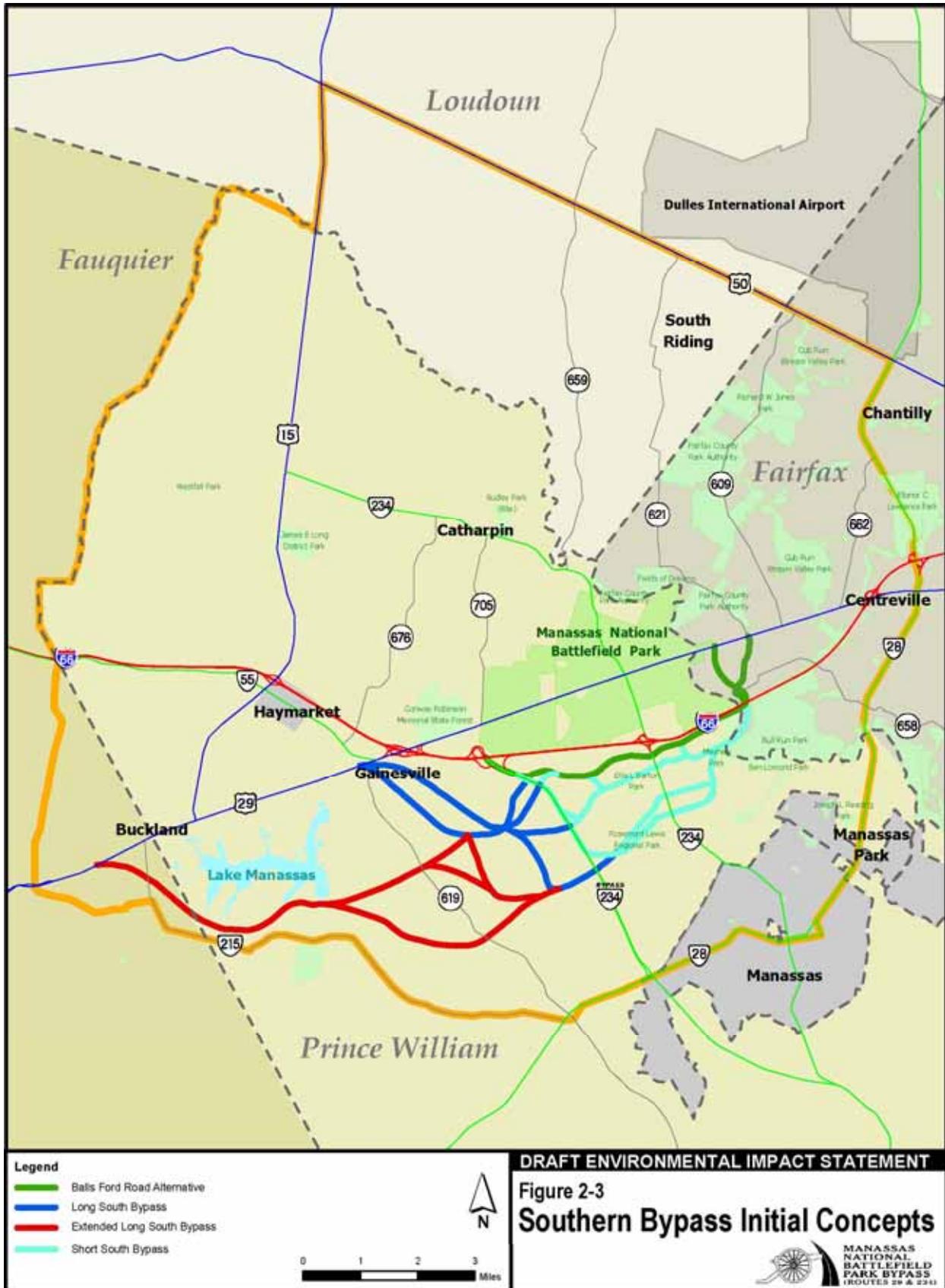
The study also included various potential routes for relocating Route 29 to the south of the Park. Although these routes were not recommended for additional study as part of that process, FHWA was requested to include a series of potential southern concepts as part of this DEIS by the public. These concepts are shown in **Figure 2-3** and include the use of existing roadways, such as Balls Ford Road as well as a variety of southern bypasses. All of the initial concepts considered in this process are shown on **Figure 2-4**.

2.1.2 Preliminary Screening of Initial Concepts

The initial concepts were screened against several criteria, including the elements of need and goals established as part of the Purpose and Need evaluation. The initial concepts were also screened for fatal flaws at a very general level and the results are shown in **Table 2-1**. Resources within a 1,500-foot wide corridor were identified as part of the screening process.







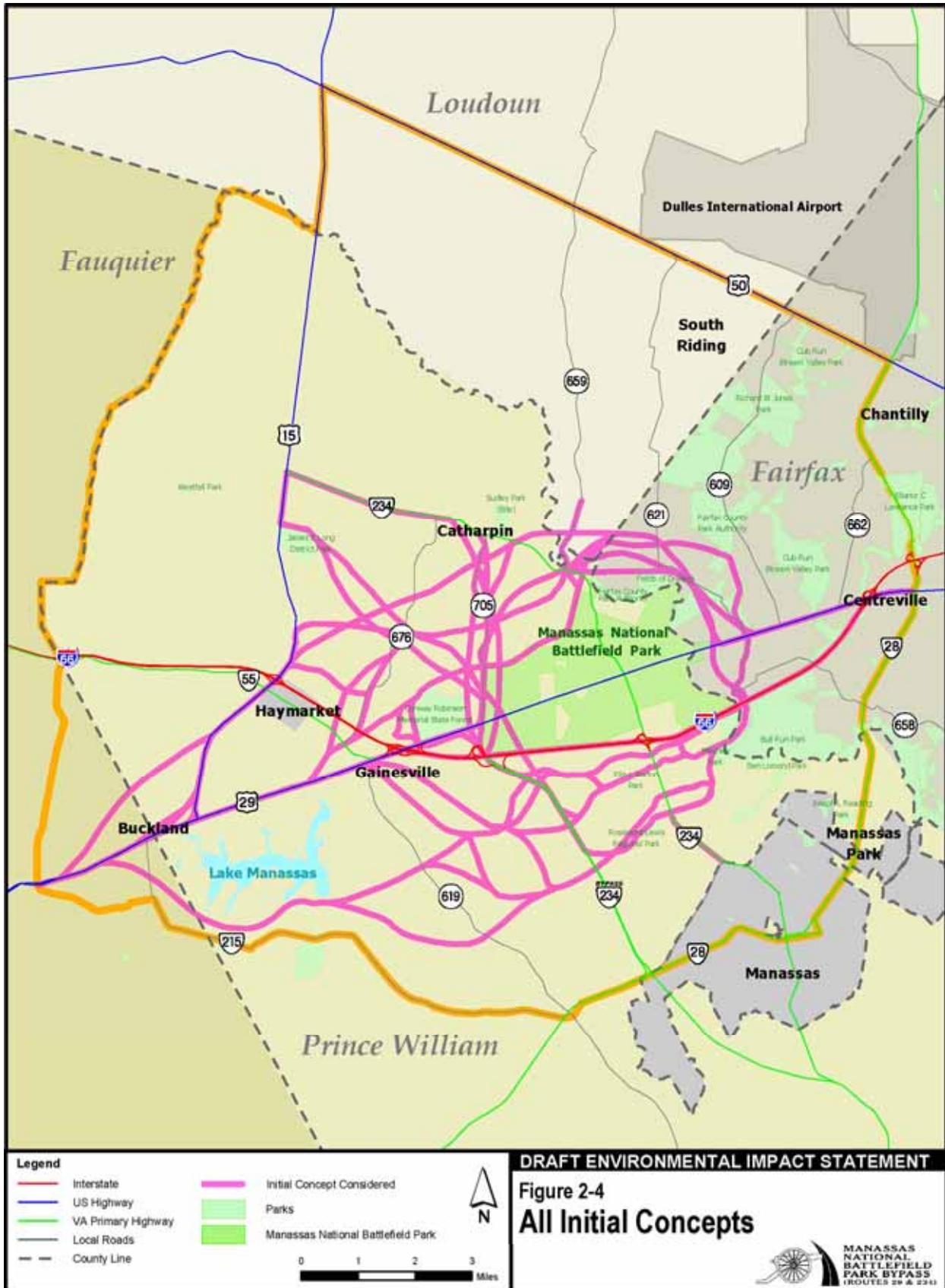


TABLE 2-1: INITIAL CONCEPTS IDENTIFIED FROM PREVIOUS STUDIES

Concept and Source	Notes
I-66 MIS Strategy 3-A	Included in No-Action Alternative
I-66 MIS Strategy 3-B	Included in No-Action and Transit Alternative
I-66 MIS Strategy 3-C	Included in Transit Alternative
I-66 MIS Strategy 3-D	Included Transit Alternative and Concept 3
I-66 MIS Strategy 3-E	Included Transit Alternative and Concept 3
I-66 MIS Strategy 3-F	Included Transit Alternative and Concept 3
Rte 29 Corridor Study Long North Bypass	Retained with modifications as Concept 5
Rte 29 Corridor Study Short North Bypass	Retained with modifications as Concept 2A
Rte 29 Corridor Study Short North Bypass (with Segment A-4a)	Retained with modifications as Concept 2C
Rte 29 Corridor Study Designation on I-66	Retained with modifications as Concept 3
Rte 234 FEIS Alternative A	Dropped due to location within Park
Rte 234 FEIS Alternative B	Dropped due to lack of connection back to Route 234 and Residential and Community Impacts
Rte 234 FEIS Alternative A-1	Duplicative with Route 234 FEIS Alternative B in study area
Rte 234 FEIS Alternative B-2	Duplicative with the Route 234 FEIS Original Selected Alternative in study area
Rte 234 FEIS Alternative B-4	Dropped due to location within Park
Rte 234 FEIS Original Selected Alternative	Modified and improved as Concept 1
Rte 234 FEIS Modified Selected Alternative	Retained with modifications as Concept 1
Balls Ford Road Alternative	Retained with modifications as Concept 4
Long South Bypass	Dropped due to Residential Impacts
Short South Bypass	Dropped due to Residential Impacts
Optional North Bypass	Retained with modifications as Concept 5 connecting to Concept 2
Extended Long South Bypass	Dropped due to Residential Impacts

The initial concepts were refined into four categories: the No-Action Alternative, the Transit Concept, the Transportation System Management (TSM) Concept, and several Roadway Relocation Concepts. These were defined as the Preliminary Concepts.

No-Action Alternative

A No-Action Alternative was developed to serve as the baseline against which all other alternatives are compared. The No-Action Alternative provides no improvements or relocation of Route 29 or Route 234 except for periodic maintenance of the roadways along the existing corridors. Under the No-Action Alternative, Routes 29 and 234 would remain open within the Park in their existing configuration. However, other planned improvements to the regional roadway and transit network within the study area, as outlined in *Constrained Long-Range Transportation Plan for the National Capital Region (CLRP)*, are assumed to be in place by the design year, which is 2025.

These improvements include widening of I-66, construction of the Route 234 Bypass North Extension, and construction of the Tri-County Parkway. For the purposes of this DEIS, improvements to these facilities are included as coded in the regional CLRP network; the potential for implementing concepts that overlap segments of these projects, known as co-location, are assessed. This DEIS will document the impact of leaving the roads open within the Park and compare these impacts to those associated with concepts that allow for the closure of the roads.

Transit Concepts

Concepts were developed to accommodate the demand for travel on Routes 29 and 234 within the Park by the use of transit and demand management techniques. For the purposes of this DEIS, a comprehensive Transit Concept was developed.

Several transit measures within the study area were identified in the CLRP, the *I-66 Multimodal Transportation & Environmental Study*, local comprehensive plans, and long-range plans for local transit agencies, such as the Virginia Railway Express (VRE) and Washington Metropolitan Area Transit Authority (WMATA). Planned improvements within the study area include the construction of transit facilities, such as park-and-ride lots and transfer centers, implementation of incentive programs for carpooling, expansion of VRE service, and potential extension of Metrorail service to Centreville. Transit improvements were considered on their own as well as in conjunction with proposed roadway improvements.

Several transit providers operate services within the study area, including VRE, WMATA, and local transit providers. These providers do not have transit routes on Routes 29 and 234 within the Park, but provide access to commuters within the study area, primarily along I-66 and along a VRE service line that passes south of the Park through the City of Manassas. The VRE does not have any stations located within the immediate study area; however, there are three stations within the general area. The Manassas Park and Broad Run/Airport Stations are located within the southern vicinity of the study area and the Manassas Station is located immediately adjacent to the study area boundary.

Metrobus serves the eastern edge of the study area with Routes 12 C-F, L-M, and R-S. These routes extend west along I-66 and Route 29 to the vicinity of Stone Road, approximately 2 miles east of the Manassas National Battlefield Park. These routes provide connections to the Metrorail system at the Vienna Metrorail Station. Metrorail's Orange Line provides service in the I-66 corridor. The west terminus of the rail service is at the Vienna Metro Station, approximately 13 miles east of the study area boundary. Extending service as far west as Centreville is being studied as part of the *I-66 Multimodal Transportation & Environmental Study*.

OmniLink provides local bus service in and around Manassas. The Manassas Park Line runs between the Manassas VRE station and the Manassas Mall in a loop primarily along Manassas Drive, Lomond Drive, Route

234, Route 28, Liberia Avenue, and Signal Hill Road. The Manassas Line runs linearly between the Manassas VRE Station and the Northern Virginia Community College campus at the southern edge of the Park, primarily using Route 234. Operating headways are approximately one hour. OmniRide provides commuter bus service from the Manassas area to Washington, D.C., using Routes 234 and 28 to I-66 via the Manassas and Manassas Metro Direct routes. These routes run on headways of approximately 30 minutes.

To meet the Purpose and Need, the Transit concept would have to accommodate the demand of the existing north-south and east-west movements currently using Routes 29 and 234 through the Park, which would be closed in this concept. **Figure 2-5** shows the proposed transit improvement routes that were tested as potential measures to accommodate that demand. North-south transit movements would be provided along bus routes using the Route 234 North Bypass Extension that is included in the No-Action Alternative. East-west service would be located on I-66. In addition, an extension of VRE rail service from Manassas to Haymarket was analyzed as another mechanism to accommodate demand as identified in a plan conducted by VRE. Transportation Demand Management (TDM) measures were generally assessed as part of this system evaluation. However, detailed transit operating plans and detailed TDM measures were not developed since this concept did not pass the preliminary screening as discussed below in section 2.2.

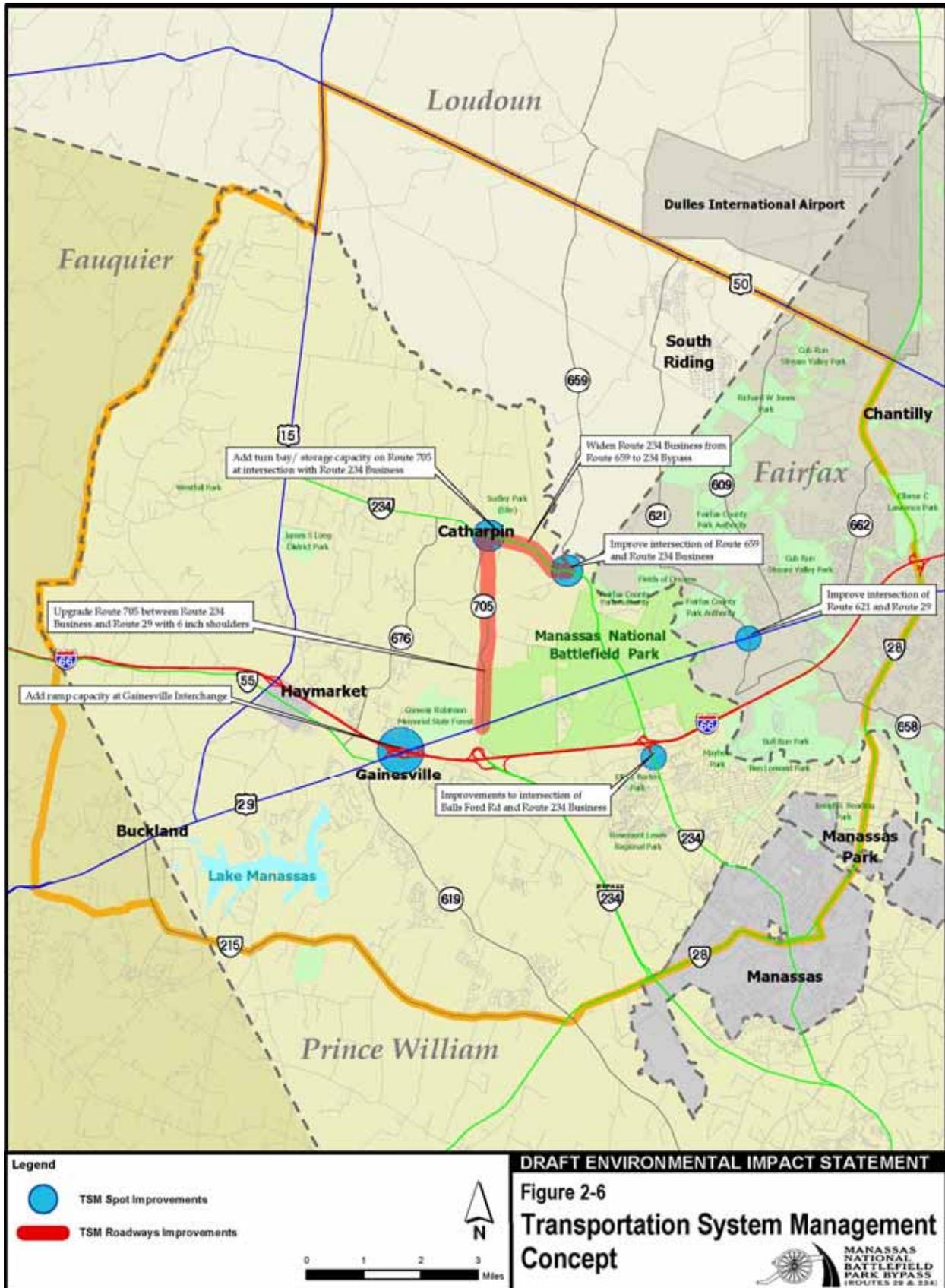
Transportation Systems Management (TSM) Concept

The purpose of the TSM concept is to maximize the efficiency of the local transportation system, after Routes 29 and 234 through the Park have been closed, by including minor, low-cost spot improvements that allow the system to operate more efficiently without the construction of major new roadway segments. These spot improvements would include adding shoulders, removing sight-distance problems, adding or lengthening turn lanes, and improving signal timing. The TSM alternative for this DEIS includes the closure of Routes 29 and 234 within the Park. Because major improvements are not proposed, these routes would be co-located onto existing roads or onto those roads planned for construction prior to 2025 in the CLRP. As part of the TSM concept, Route 29 would be co-located onto an improved I-66 and Route 234 would be co-located onto the planned Route 234 Bypass North Extension that is included in the No-Action Alternative network.

The first step in identifying additional TSM spot improvements was a traffic analysis that determined where traffic would shift if Routes 29 and 234 were closed and no major capacity improvements were constructed. The traffic analysis indicated that the east-west traffic demand primarily shifted to the I-66 corridor and the north-south traffic demand shifted to Route 705 (Pageland Lane) / Route 234 Bypass North Extension corridor. Traffic was also projected to increase along existing Route 234 Business northwest of the Park between the Route 234 North Bypass and the existing location of Route 659 in the Sudley Springs area.

Possible TSM improvements were developed to improve traffic flow primarily through these areas, see **Figure 2-6**, without construction of any additional roadway facilities beyond those already planned locally for construction. The proposed TSM improvements included upgrading Route 705 (Pageland Lane) between Route 29 and Route 234 Business, improving operations and adding turn bay / storage capacity at the intersection of Route 705 with Route 234 Business, widening Route 234 Business from Route 234 Bypass North to Route 659, and improving several intersections and ramps.

These improvements, packaged as the TSM Concept, were evaluated in conjunction with the closure of Routes 29 and 234 within the Park.



Roadway Relocation Concepts

Roadway Relocation Concepts consist of either upgrades to existing roadways, construction of new roadways on new location, or a combination of the two. Upgrades of existing roadways may include improving sight distances, increasing curve radii, increasing lane widths, adding shoulders or lanes, or changing route designation. New roadways on new location could consist of building a roadway where none exists today, either to act as a new transportation facility on its own or to link to existing, upgraded sections.

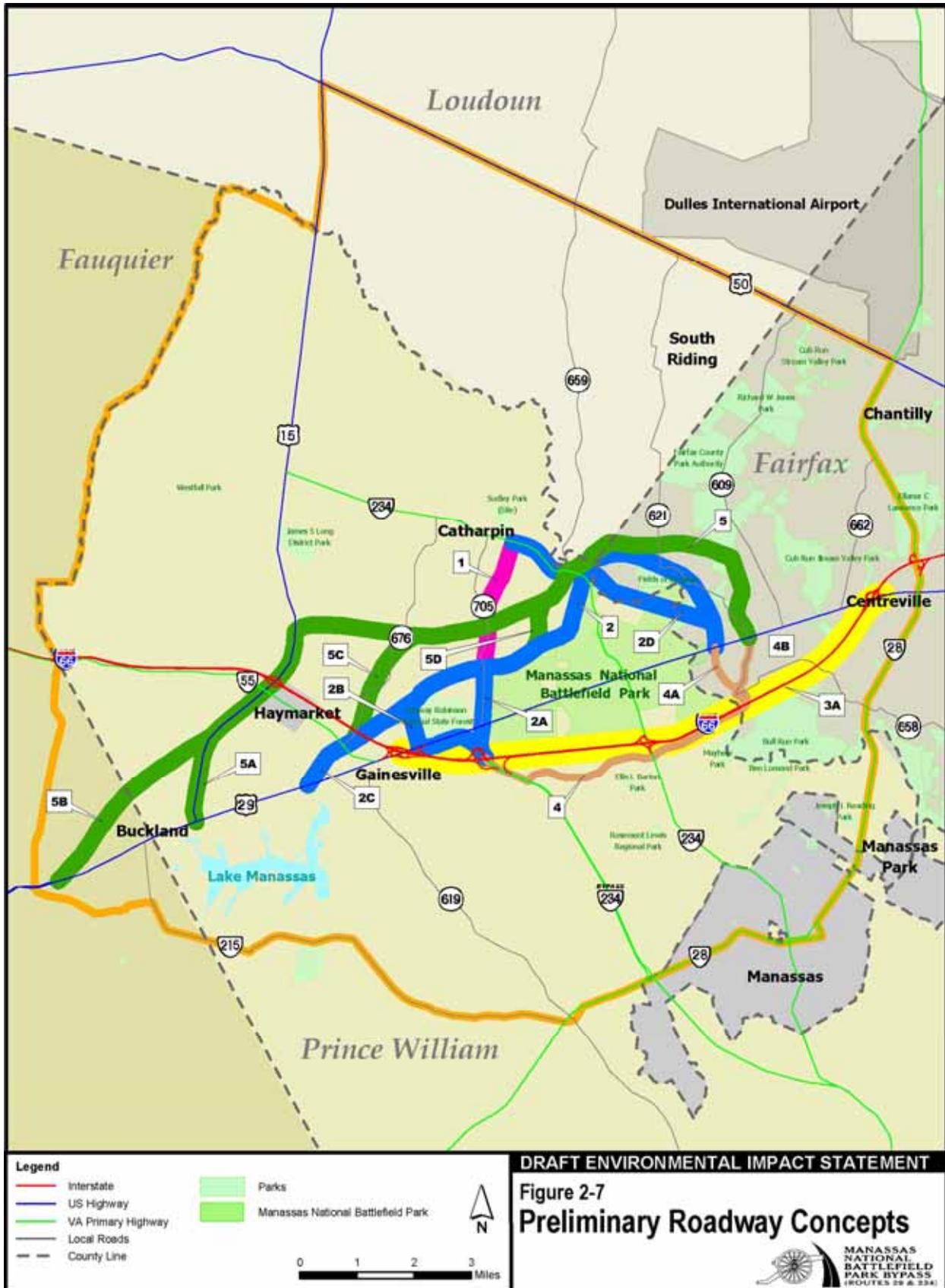
The potential Roadway Relocation Concepts within the list of Preliminary Concepts were refined into five general corridors and are shown in **Figure 2-7**. These concepts were defined as general locations for transportation facilities that could include bicycle and pedestrian facilities, as well as provide potential routes for transit within the study area. In addition to the No-Action, TSM and Transit concepts, the set of Preliminary Concepts included the following:

- Corridor 1: Located primarily along an extension of the existing Route 234 Bypass and in the location of the proposed Route 234 North Bypass Extension. This corridor would probably be combined with others to provide east-west Route 29 movements. Since the Route 234 North Bypass Extension is included in the CLRP and could be constructed in this location, Corridor 1 is included as a component of the TSM and Transit concepts as described above.
- Corridor 2: Located north of the Park, this is the shortest concept in length. This route is located along the edge of the Park with three options for connections to Route 29: Option 2A follows the western edge of the Park to reconnect with Route 29 in the same location as Corridor 1, Option 2B continues west and then follows the western edge of Conway Robinson Memorial State Forest to Route 29, and Option 2C crosses I-66 west of the Gainesville interchange and connects to Route 29 north of Lake Manassas.
- Corridor 3: Involves three options. The first option would involve co-locating Route 29 with a portion of I-66 from Centreville to Gainesville. This option would involve adding more lanes to I-66 and/or other improvements. The other options include the construction of a frontage road along I-66 to accommodate Route 29 traffic or construction of a new parallel Route 29 just north of I-66 along the southern edge of the Park.
- Corridor 4: Located south of I-66 generally along Balls Ford Road. This corridor includes two alternative connections to Route 29 east of the Park: 4A and 4B.
- Corridor 5: Located north of the Park, this is the longest potential route with connections either east (Option 5A) or west (Option 5B) of Buckland. An interim connection along Catharpin Road is Option 5C.

2.1.3 Refinement and Screening of Preliminary Concepts

The Preliminary Concepts were presented to the public at a workshop in December of 2002 with information on Purpose and Need and existing conditions. Through the public involvement process and coordination with local jurisdictions, the Preliminary Concepts were refined and put through a second level of screening. Several changes were made to the concepts and a new concept was added.

In response to public comments and at the request of elected officials, Prince William County, Fauquier County, and the Virginia Department of Historic Resources (VDHR) Corridor 3B was added to the Preliminary Concept list for evaluation. Concept 3B was an optional extension to Corridor 3 from beyond Gainesville to a point west of Haymarket. A new roadway would be constructed to connect I-66 between Turner Road and Beverly Road to Route 29 near the Vint Hill Road intersection. This concept was added to



the set of Preliminary Concepts as Corridor 3B; for nomenclature purposes, the concept previously identified as Corridor 3 became Corridor 3A (see **Figure 2-8**).

A new segment known as Concept 2D was developed to minimize impacts to private property and residential development northeast of the Park. This concept would require land from within the Park and would connect to the existing Route 234 Business north of the Park, but would still benefit the Park by allowing for the closure of potentially 7 miles of Routes 29 and 234. The legislation adopting this study specifies that concepts be developed “in and in the vicinity of” the Park and a request was made by local and elected officials to consider concepts that might be located within the actual boundaries of the Park as a method to minimize impacts to privately owned land and adjacent properties.

A new segment was also developed at this stage to avoid a Virginia Outdoor Foundation easement known as the Davis Tract. This segment allows for the development of Concept 5D, which is an optional connection between Concept 5 and Concept 2. This concept minimizes interaction with the Davis Tract and reduces impacts to cultural resources along the boundary of the Park and the Davis Tract where Concept 2 was located.

The second level of screening was conducted for all of the refined Preliminary Concepts and impacts were calculated using 1,500-foot bands. Screening considerations at this stage included preliminary traffic impacts, environmental considerations, and engineering complexity. The environmental considerations included natural resource impacts, such as stream crossings and floodplain encroachments, social impacts, such as potential for displacement and parkland impacts, and cultural impacts on the Manassas National Battlefield Park and the Davis Tract, among others.

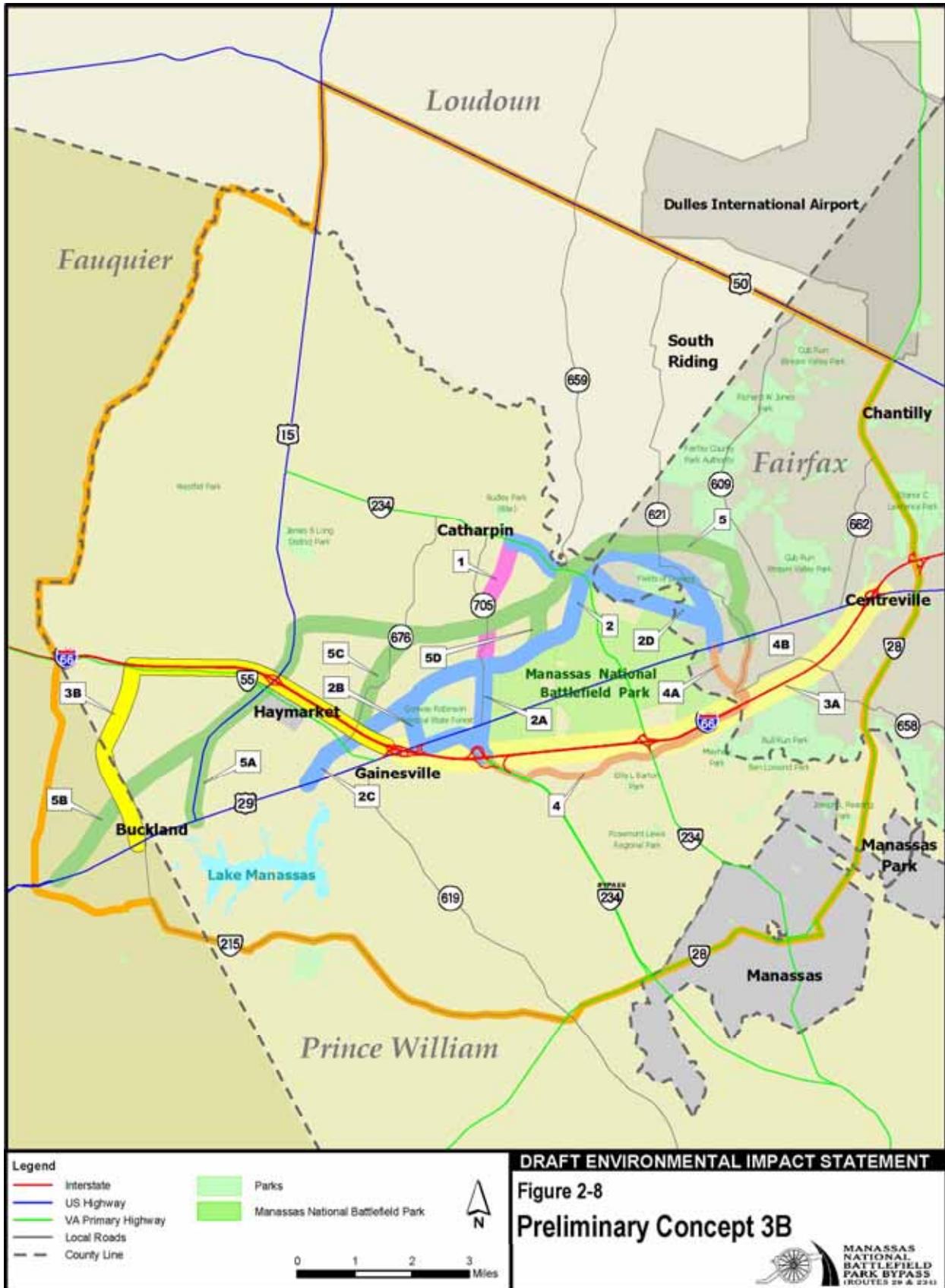
2.1.4 Refinement of Preliminary Concepts into Candidate Build Alternatives

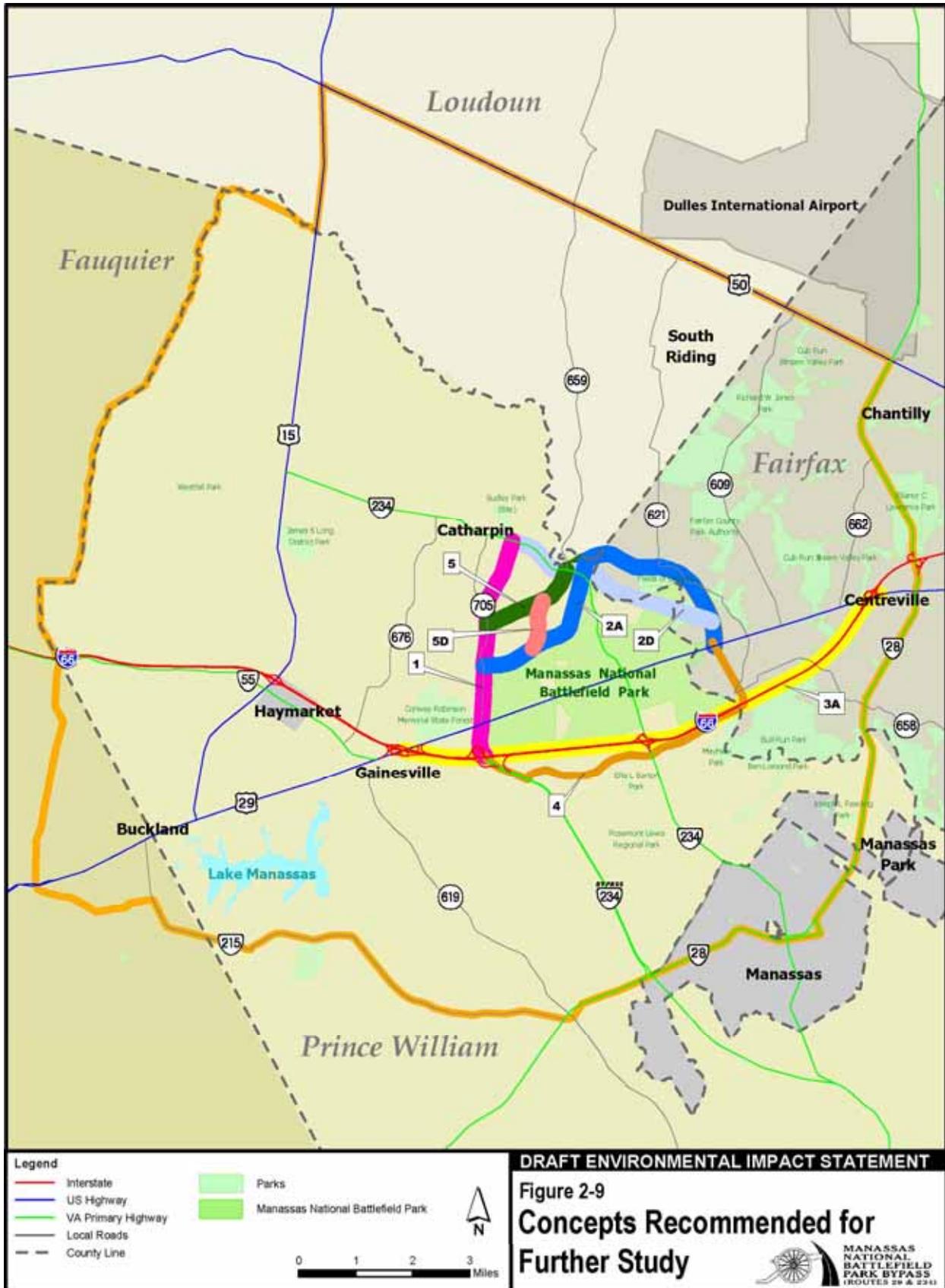
Upon completion of the screening, the most promising Preliminary Concepts formed the basis for development of the set of Candidate Build Alternatives. The Preliminary Concepts carried forward included the No-Action Alternative, as it is required for use as a baseline comparison for the proposed alternatives, the TSM Concept as well as Corridors 1, 2A, 2D, 3A, and 4A. A portion of Corridor 5, from Route 234 Business to Corridor 1, was carried forward as well, as shown in **Figure 2-9**.

An iterative process for translating these concepts into alternatives involved detailed mapping and field verification of environmental resources, conceptual design drawings, increasingly detailed preliminary design drawings of road and intersection configurations, and further consultations with the public and local and State agencies. The next step in the process was the development of 250-foot corridors based on the engineering of centerlines for the proposed alternatives. At this stage, the numbered Preliminary Concepts were combined to make end-to-end Candidate Build Alternatives A-F, as well as the No-Action and TSM Concept. A third level of environmental screening was conducted to identify resources within the 250-foot corridors that resulted in the elimination of Candidate Build Alternative F due to displacement impacts and construction concerns, which was proposed south of the Park and I-66 along Balls Ford Road.

2.1.5 Identification of Reasonable Alternatives for Further Study

Translating the general 250-foot Candidate Build Alternatives into specific physical improvements involved consideration of engineering, traffic, and environmental considerations. Engineering considerations included geometric design standards for horizontal and vertical alignments, widths of travel lanes and shoulders, cut and fill slopes, stormwater and drainage elements, and cost. Traffic considerations included volumes, speeds, lane capacities, and intersection turning movements. Environmental considerations included potential effects on

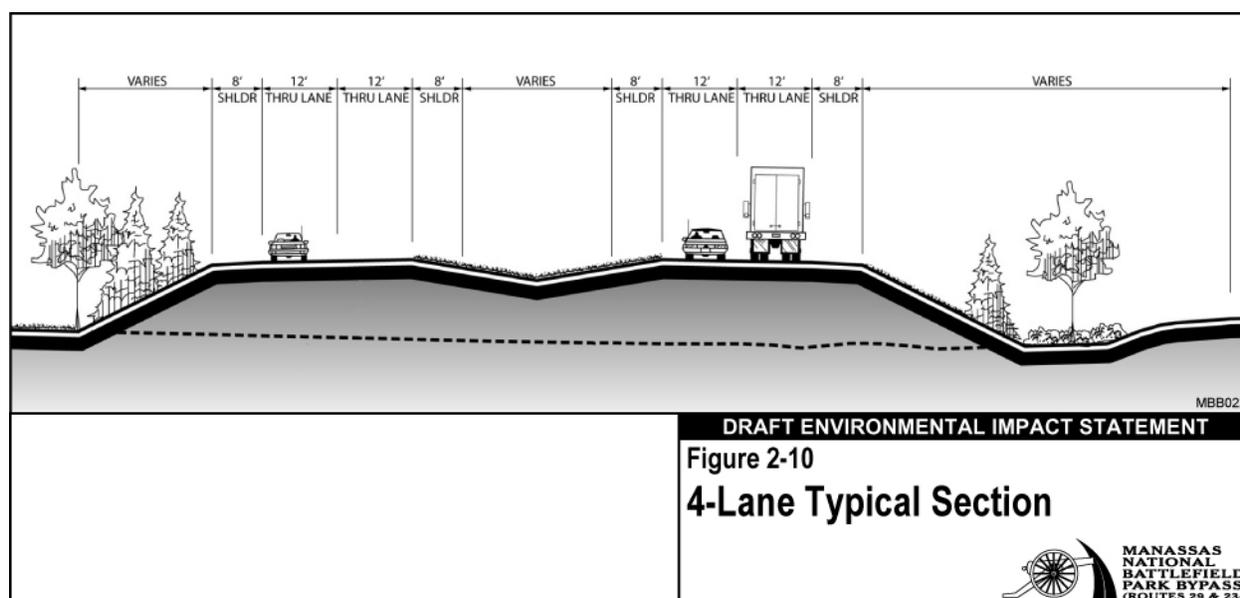




residential areas, parks, businesses, noise levels, water quality, wetlands, visual quality, vegetation, and cultural resources in and around the Park.

Development of Four-Lane Concepts

Route 29 and Route 234 are currently two-lane roadways within the Manassas National Battlefield Park. However, as will be discussed in the traffic analysis portion in Chapter 4 of this DEIS and the accompanying *Traffic Needs and Safety Report*, traffic volumes on these routes already indicate demand for four-lane facilities. The travel demand modeling conducted for this DEIS also indicated that the construction of only two-lane facilities as part of the relocation proposals would result in failing levels of service and traffic congestion on the alternatives. A recommendation to study the effects of four-lane configurations was made and coordinated with the localities, State agencies, and the public. The typical section for the proposed Candidate Build Alternatives is shown in **Figure 2-10**.



Elimination of I-66 Co-Location Alternatives

Due to concerns about an inconsistent cross-section on I-66 (number of lanes) that would be created by this relocation of Route 29 from Centreville to Gainesville and the resulting congestion projected to occur at the merge points, alternatives that involved co-location of Route 29 onto I-66 were eliminated. The Virginia Department of Transportation expressed concerns about alternatives that involved co-location of Route 29 onto I-66 as part of the alternatives development process. The traffic analysis indicated that at least one lane in each direction of I-66 would be needed to meet the travel demand created by shifting the traffic currently using Route 29 onto I-66. A revised southern alternative was developed as a compromise alternative that would not be located within the I-66 right-of-way.

Coordination with Agencies, Local Officials, and the General Public

The development of alternatives was coordinated with Federal, State, and local agencies, citizens, interest groups, civic organizations, and businesses. FHWA and NPS encouraged agency and public participation in the process. Each level of the screening process concluded with a presentation of the preliminary concepts and/or alternatives to the Citizen's Advisory Board, local and State agencies, and the general public at public

workshops. Details of these meetings are presented in Chapter 7. All decisions made by the Study Team were coordinated with VDOT and Prince William County, as required in the legislation mandating this study.

2.2 ALTERNATIVES CONSIDERED AND ELIMINATED

As a result of the alternatives refinement and screening, several concepts and alternatives were eliminated from further consideration and were not carried forward in the environmental process as reasonable alternatives. Reasons for elimination varied; only the best performing concepts were retained at each stage of the screening process. The concepts dropped from further study and the reasons behind their elimination are summarized below.

2.2.1 Initial Concepts Eliminated

There were several initial concepts developed in the first stages of the study that were eliminated in the first screening before they were developed as full concepts. These initial concepts were screened against the elements of Purpose and Need and for potential fatal flaws.

Route 234 Alternative A and B-4 (From Route 234 FEIS)

These concepts were analyzed as a potential relocation for Route 234 from within the Park boundaries and were not selected by VDOT in their studies as the preferred location. The concepts would connect I-66 east of the current Route 234 Bypass to a point on Route 234 Business east of Catharpin. These concepts were re-evaluated for the purposes of this study and eliminated because they would not provide a connection to the section of the Route 234 Bypass already constructed and would impact sensitive resources within the Park as they are located well within Park boundaries along a power line easement that has since been relocated.

Route 234 Alternative B and A-1 (From Route 234 FEIS)

This concept would connect to I-66 approximately one-half mile west of Alternative A's I-66 interchange location at the existing Route 234 Bypass location. On the north end, this alternative would parallel Pageland Lane (Route 705) on the west side to just south of Artemus Road (Route 704), then curve to the west and generally follow along the north side of Catharpin Creek to intersect US Route 15 just north of James Long District Park. This concept was eliminated due to its lack of connection back to existing Route 234 northwest of the Park and potential impacts to residential and community facilities that have been constructed since this alternative was analyzed by VDOT.

Long South Bypass

This concept was located south of the Park and I-66 and used Bull Run Post Office Road right-of-way and a new alignment along the edge of Ben Lomond Regional Park and Bull Run Regional Park, as well as portions of Lomond Drive and the Route 234 Bypass. This concept was dropped due to potential impacts to several developed residential areas.

Short South Bypass

This concept was located south of the Park and I-66 and used Bull Run Post Office Road right-of-way, Coppermine Drive, Williamson Boulevard, Coverstone Drive, and Route 234 Bypass along with some new segments on new location between these existing roads. This concept was dropped due to potential impacts to several developed residential areas.

Extended Long South Bypass

This concept was similar to the South Bypass concept except it would extend farther to the west of the existing Route 234 Bypass location and include more new roadway construction. This concept was dropped due to the potential for high residential impacts to developed areas south of I-66 and due to its significant physical distance from the Park, making it unlikely to provide meaningful travel options for those people currently using Routes 29 and 234.

2.2.2 Preliminary Concepts Eliminated

Several Preliminary Concepts were eliminated from consideration after a second level of screening. In some cases, the concepts were re-designed to minimize impacts and in some instances only certain segments of the concepts were eliminated.

Mass Transit

Although the Mass Transit Concept was eliminated as a stand-alone alternative during the screening of the preliminary concepts, elements of mass transit will be considered as part of the development of transportation corridors and the concept of additional transit on I-66 is encouraged. The Mass Transit Concept did not address several of the elements of need for this relocation study and was therefore eliminated. An investment in transit without any additional capacity or alternate locations for Route 29 and 234 would result in discontinuous routes, which is one of the primary elements of need. In addition, a “best case” estimate of transit ridership indicates that the transit concept would not provide adequate travel demand to replace the capacity lost by closure of both Routes 29 and 234. Finally, the transit concept was eliminated because it would not provide meaningful access to the quarries that generate much of the truck traffic on Routes 29 and 234 and would not provide relocated access to the private in-holdings within the Park.

As part of the evaluation of the transit concept, a cursory analysis of the mode split effects of implementing transit was prepared. One of the primary goals is to provide for an alternative means of transportation for the 28,000 daily trips projected to use Routes 29 and 234 in the future design year of 2025. A mode split for transit of 10%, which is a very optimistic projection, would still leave over 25,000 trips that need to be accommodated in addition to the stand-alone transit alternative. Given the low density of land use in the vicinity of the Park and diversity of local trips shown as the primary origins and destinations of traffic traveling on these routes, even a 10% mode split would be difficult to achieve.

Segment of Concept 2 within Fairfax National Estates

Concept 2 was shifted to the south to avoid residential displacements, noise, and visual impacts to the residential area known as Fairfax National Estates that is located north of the Park. The original concept used the right-of-way of a private access route, Sudley Road, as the primary route for the relocation concept. Sudley Road also served as the primary neighborhood access road and locating the concept in this location would bisect the neighborhood and result in substantially more displacements than other reasonable alternatives. Concept 2 did proceed into the next step in the process after being relocated to the south of Fairfax National Estates.

Segment of Concept 2 East of the Davis Tract

A segment of Concept 2 was originally developed along the boundary of the Manassas National Battlefield Park just to the east of the Davis Tract, a Virginia Outdoors Foundation easement acquired for historic preservation. During the development of preliminary concepts, a connection between Concepts 5 and 2 was developed to eliminate the need for this segment of Concept 2 and minimize cultural resource impacts in this location.

Concept 2B

Concept 2B followed the edge of the Park to the north and west and, after crossing Pageland Lane, continued west and followed the boundary of Conway Robinson Memorial State Forest to Route 29. Concept 2B also included use of a portion of Route 29 to the east to connect into the existing Route 23 Bypass Interchange with I-66. This concept was dropped from further consideration due to excessive impacts to resources in the area, particularly Conway Robinson Memorial State Forest and residences within the Heritage Hunt neighborhood. In addition, the circuitous connection back to the Route 234 Bypass resulted in lower travel demand when compared to other concepts.

Concept 2C

This concept is the same as Concept 2B except that, instead of following the boundaries of Conway Robinson Memorial State Forest back to Route 29, Concept 2C continues to head southwest from the northwest corner of Conway Robinson Memorial State Forest, crosses I-66 west of the Gainesville interchange, and connects to Route 29 north of Lake Manassas. This concept was eliminated due to its disproportionate residential displacements within the Heritage Hunt neighborhood as well as impacts to Conway Robinson Memorial State Forest.

Concept 3A (North of I-66)

This concept consisted of a new Route 29 located on new alignment running parallel to I-66 on the north side. This concept was dropped due to lack of travel demand usage and traffic operation concerns when compared to the other remaining alternatives and was originally tested as a two-lane concept. However, after the decision was made to use the four-lane configuration, this concept was reviewed at the request of the public and localities and was found to have improved demand. Thus, it was refined and added to the set of Candidate Build Alternatives as Candidate Build Alternative G.

Concept 3B

This concept was a result of public comments from the December 2002 Public Workshop and coordination with Prince William and Fauquier Counties. It is an extension of Concept 3A that continues improvements on I-66 to a point between Turner Road and Beverly Road. From this point, a new roadway on new location would connect I-66 to Route 29 near the Vint Hill Road intersection. This concept was eliminated because it did not meet several of the elements of Purpose and Need since it was located at such a long distance from the Park and did not match the origins and destinations of travelers now using Routes 29 and 234 within the Park. In addition, due to the length of the proposed improvements on I-66 and on the portion of new roadway, this concept had greater impacts to environmental resources than other more reasonable alternatives. As part of the analysis of this concept, it was acknowledged that the construction of a new link to I-66 west of Buckland could divert traffic from within the historic community, but that such a proposal should be pursued relative to other goals and objectives than this DEIS.

Concept 5 (Including Design Options 5A, 5B and 5C)

All of the concepts for the Long North Bypass were eliminated except for a portion of what was designed to connect from Concept 5 to Concept 2 as well as the segment known as 5D that avoided impacts to the Davis Tract. Concepts 5A and 5B were dropped due to the limited traffic benefits that would result in comparison to the cost and environmental impacts, including displacements, floodplain, and stream impacts, associated with the length of the concept. In addition, both concepts increased traffic on Route 15 which is not consistent with long-term goals for that scenic corridor. Concept 5C was eliminated due to a high potential for displacements along the Catharpin Road corridor and limited traffic benefits to commuters currently using Routes 29 and 234.

2.2.3 Candidate Build Alternatives Eliminated

Several of the Candidate Build Alternatives were eliminated in consultation with local and State agencies. These included alternatives that involved co-locating Route 29 onto I-66. In addition, several options were developed for some of the Candidate Build Alternatives as part of the detailed engineering design. Some of these options were eliminated subsequently as well.

Transportation System Management

The TSM Concept included minor system improvements to maximize the existing transportation system's ability to handle traffic and would co-locate US 29 traffic onto I-66. Other specific improvements considered for this alternative include intersection improvements on existing Route 234 at Pageland Lane and Gum Springs Road, and shoulder and site distance improvements along Pageland Lane.

The TSM concept was eliminated because it failed to provide a viable option for traffic now traveling through the Park on either US 29 or VA 234. In addition, VDOT expressed concerns that co-locating traffic onto I-66 under any scenario would cause backups at the locations where the new lanes would merge with I-66 traffic, creating several choke points. Additionally, none of the local comprehensive plans currently support co-location of US 29 onto I-66 and, according to VDOT, the full capacity of the I-66 right-of-way is already planned for improvement based on demand within the I-66 corridor.

Candidate Build Alternative E

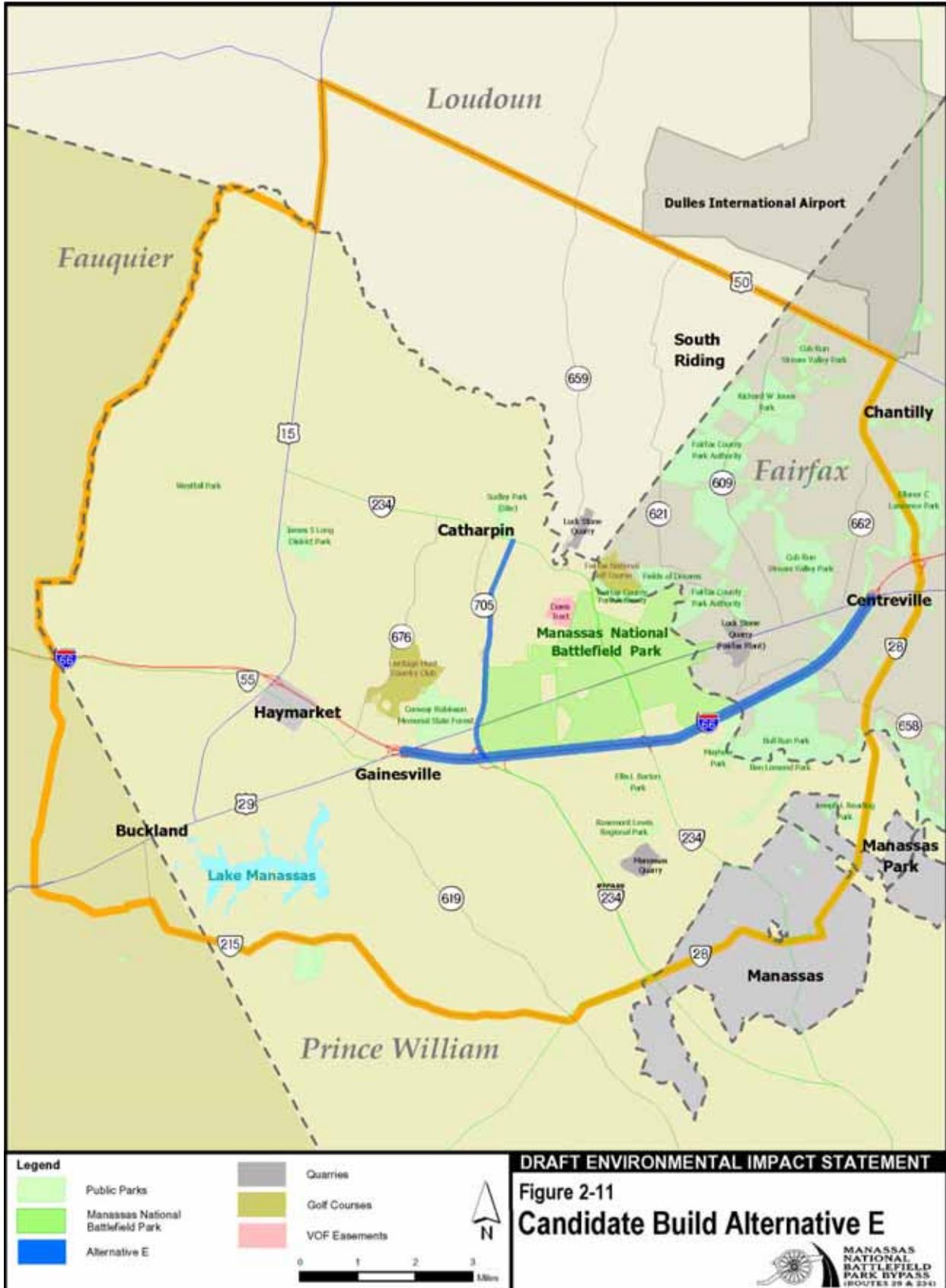
This alternative is based on a refined combination of Preliminary Concepts 3 and 1 and is shown in **Figure 2-11**. Under this alternative, traffic now traveling on US 29 would be co-located onto I-66 with an additional two lanes (one in each direction) between Centreville and Gainesville. This alternative provided a north/south route for VA 234 traffic on the western edge of the Park, parallel to Pageland Lane. Three design options were provided between the portion located approximately 1 mile north of US 29 and the existing VA 234 near the Sudley Park Site.

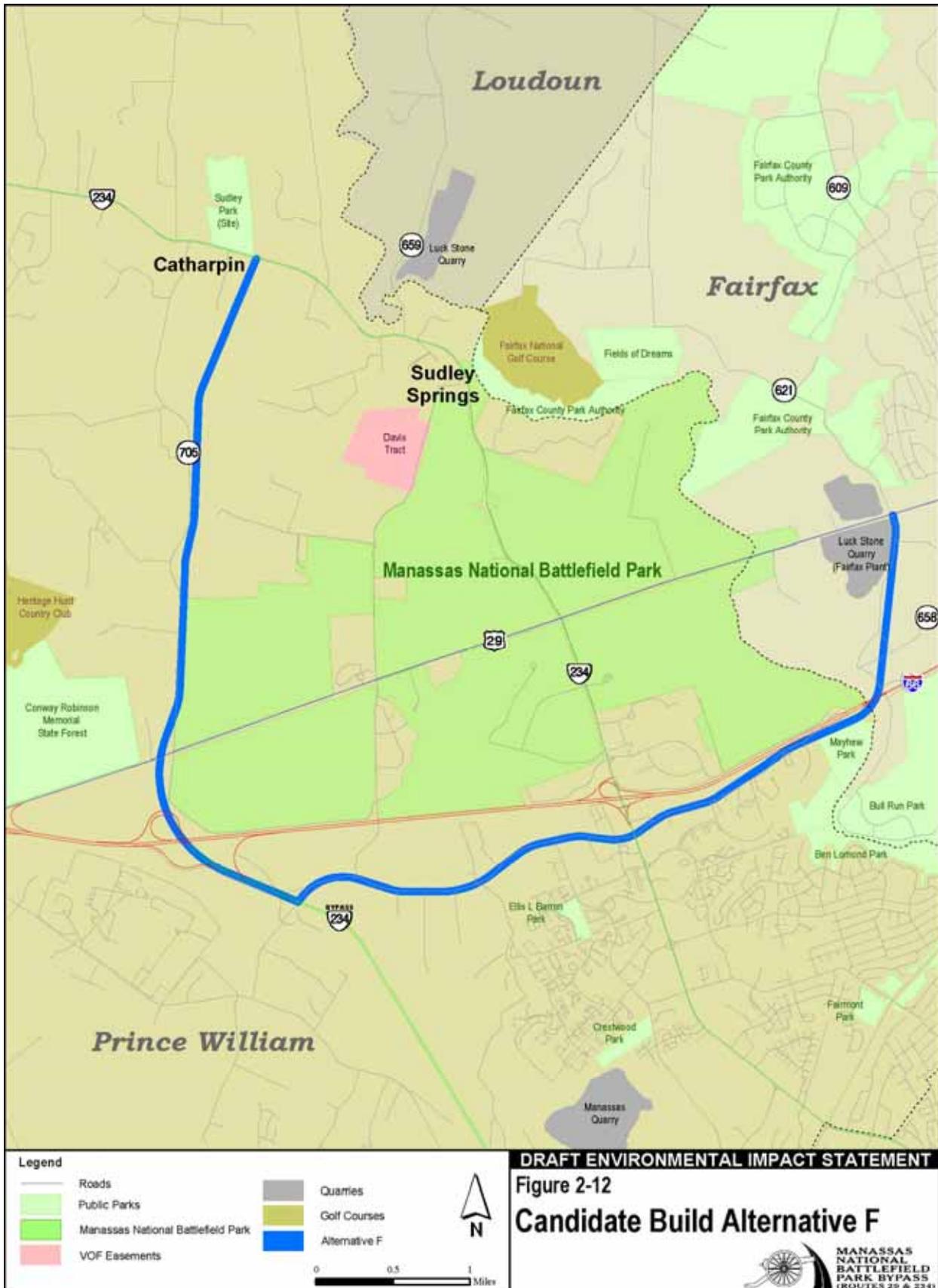
This alternative was eliminated for several reasons, although it was replaced with a similar alternative (Candidate Build Alternative G) also located within the I-66 corridor. Two scenarios were developed for co-locating US 29 onto I-66 under Alternative E: an "interim scenario" based on the existing facility and an "ultimate build out scenario" based on a potential future cross-section of I-66 being studied by VDOT in the *I-66 Multimodal Transportation and Environmental Study (I-66 MTES)*.

VDOT expressed concerns that co-locating traffic onto I-66 under any scenario would cause backups at the locations where the new lanes would merge with I-66 traffic, creating several choke points. Thus, for I-66 to perform properly, VDOT estimates that the two lanes would need to continue to the Capital Beltway. Additionally, none of the local comprehensive plans currently support co-location of US 29 onto I-66 and, according to VDOT, the full capacity of the I-66 right-of-way is already planned for improvement based on demand within the I-66 corridor.

Candidate Build Alternative F

This alternative is based on a refined combination of Preliminary Concepts 4 and 1 and is shown in **Figure 2-12**. Under this alternative, traffic now traveling on US 29 would be co-located onto an improved Balls Ford Road and included two alternative connections to existing US 29 east of the Park. This alternative provided a north/south route for VA 234 traffic on the western edge of the Park, parallel to Pageland Lane. Three design





options were provided between an the portion located approximately 1 mile north of US 29 and the existing VA 234 near the Sudley Park Site.

This alternative was eliminated primarily due a disproportionately high number of displacements in comparison with other alternatives, as well as engineering difficulties and traffic operations problems.

Design Options West of Pageland Lane

Three design options that were included in Candidate Build Alternatives B, D, E, and F and presented at the Public Workshop on July 16, 2003 were eliminated and replaced with one primary alternative alignment. The three design options were based on the Preliminary Concept 1 to handle north-south traffic. The options were eliminated because two options crossed Pageland Lane at three locations and would result in community disruption to neighborhoods and residences in the area. The other design option that followed a power line easement was eliminated due to environmental impacts, particularly a high number of stream crossings.

One of the options was to locate the new roadway on the current alignment of Pageland Lane, just outside The Park or just to the west of Pageland Lane. This would result in reduced impacts to The Park and impacts to the new boundaries of the Historic District would be approximately equal. However, it would result in increased impacts to the residences and private property along Pageland lane. It may also require reconfiguration or relocation of Pageland Lane which would increase impacts to resources in the area. The congressional mandate associated with the 1980 legislation calls for the new roadways to be “in and in the vicinity” of The Park and directly allows for the roadway within the park boundaries in this area of The Park. Therefore at NPS direction, and to minimize impacts to the residences and private property along Pageland Lane, the Study Team decided to limit alternatives in this area to east of Pageland Lane, within the boundaries of The Park.

2.3 NO-ACTION ALTERNATIVE

A No-Action Alternative was developed to serve as the baseline against which all other alternatives will be compared. The No-Action Alternative provides no improvements or relocation of Route 29 or Route 234 except for periodic maintenance of the roadways along the existing corridors and Routes 29 and 234 would remain open in the Park. However, other planned improvements to the regional roadway and transit network, as outlined in The Long-Range Transportation Plan for the National Capital Region, were assumed to be in place by the design year (2025) for the purposes of traffic forecasting, including the extension of the Route 234 North Bypass. It should be noted that the No-Action Alternative would be inconsistent with the legislative mandate that implemented this study.

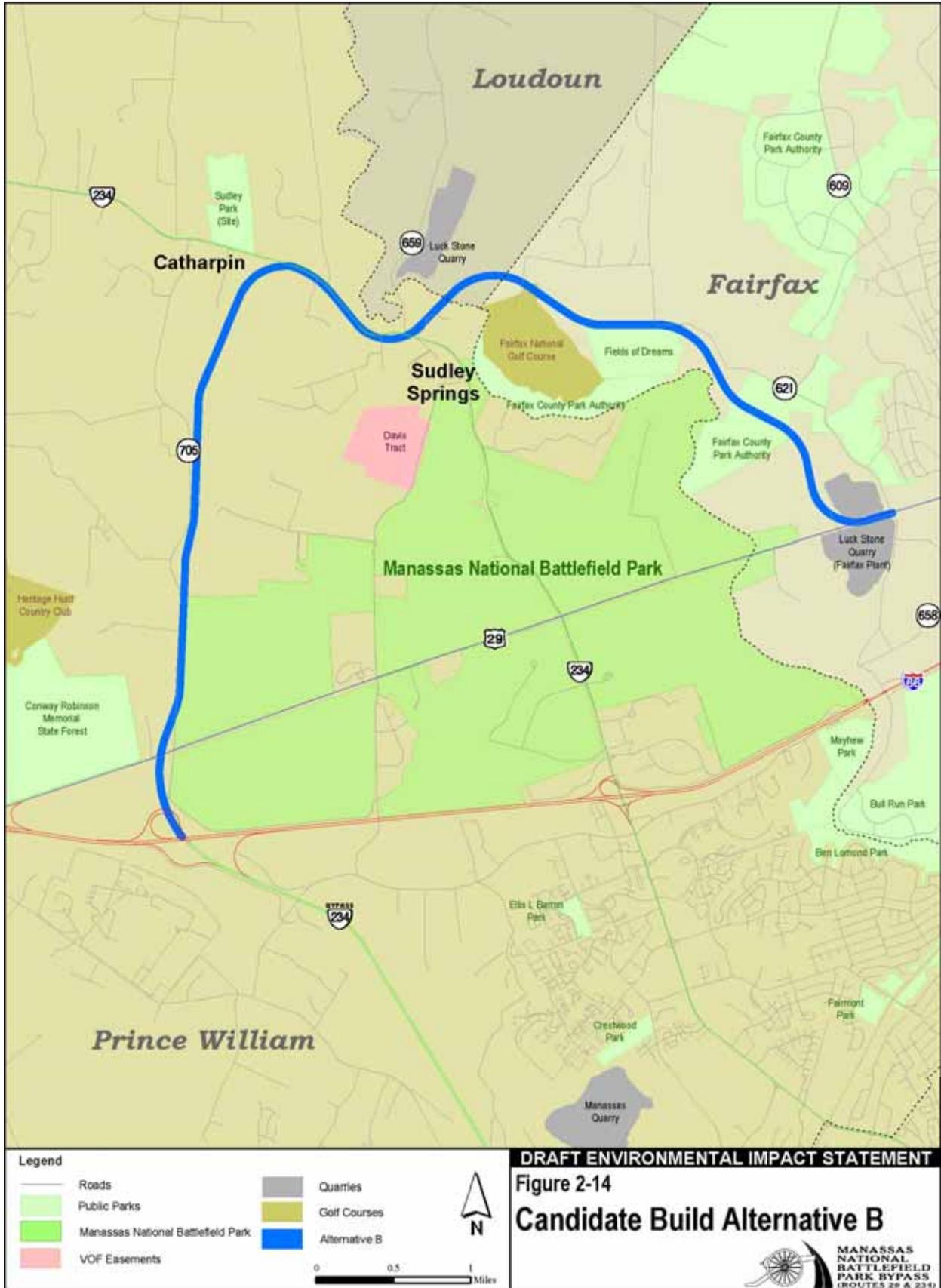
2.4 BUILD ALTERNATIVES

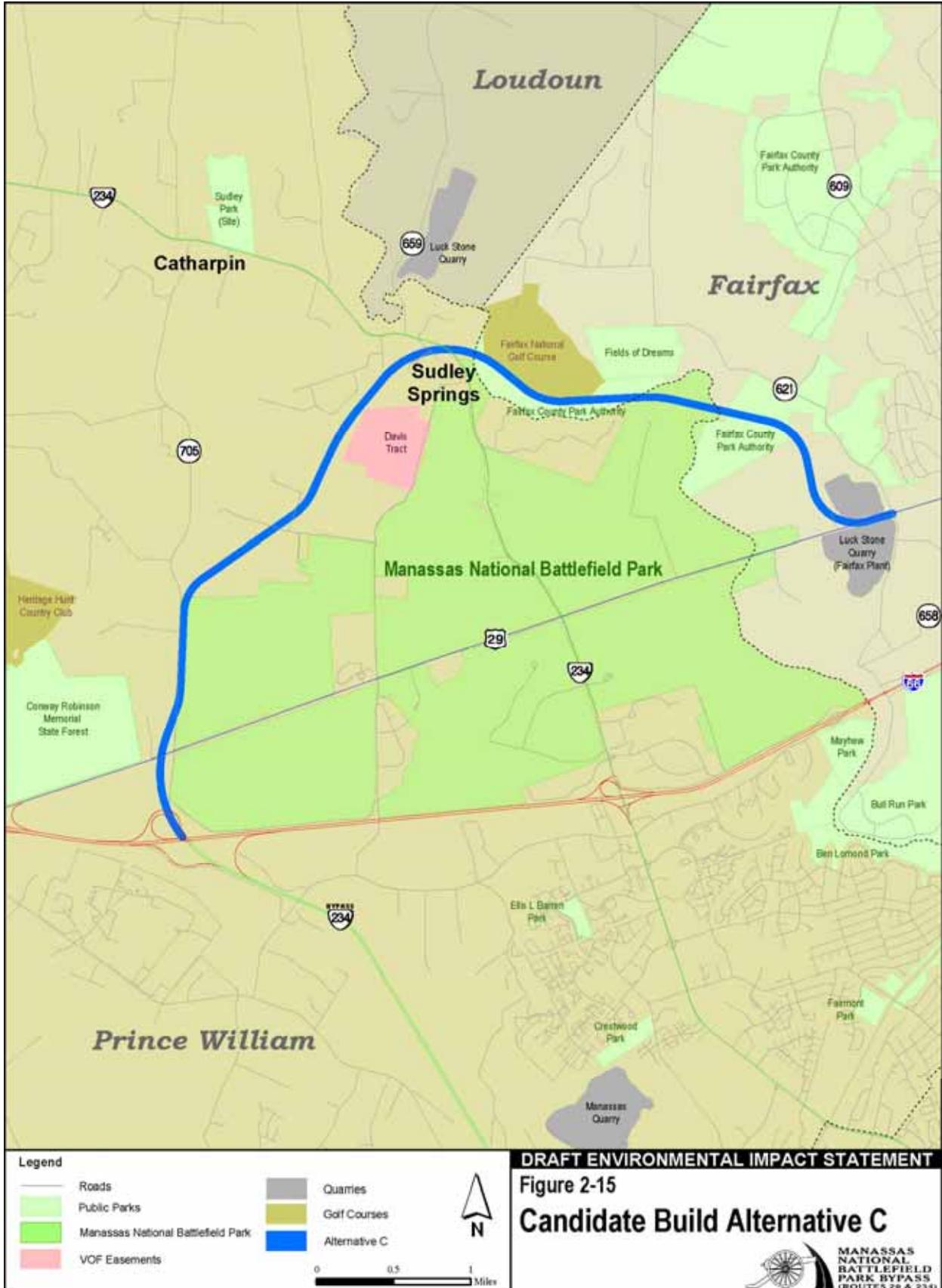
At the conclusion of the alternatives development and screening process, five Candidate Build Alternatives and the No-Action Alternative were retained for detailed evaluation. The Candidate Build Alternatives are shown in **Figure 2-13** through **Figure 2-17**. More detailed mapping of these alternatives is provided in Chapter 4 of this DEIS. In each build alternative, the roadways would be closed within the Park to commuter traffic and these relocation routes would be re-designated as Routes 234 and 29.

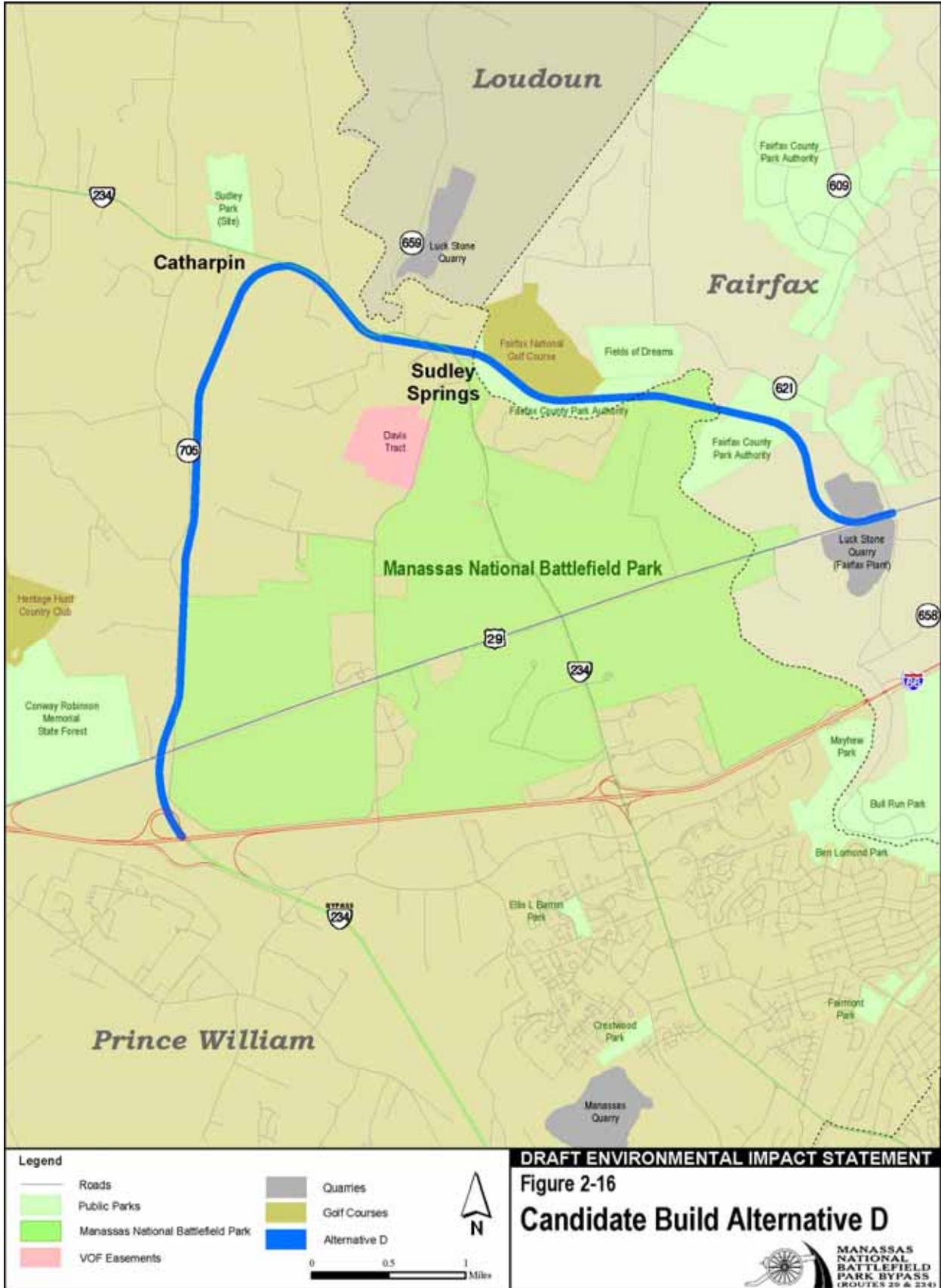
2.4.1 Candidate Build Alternative A

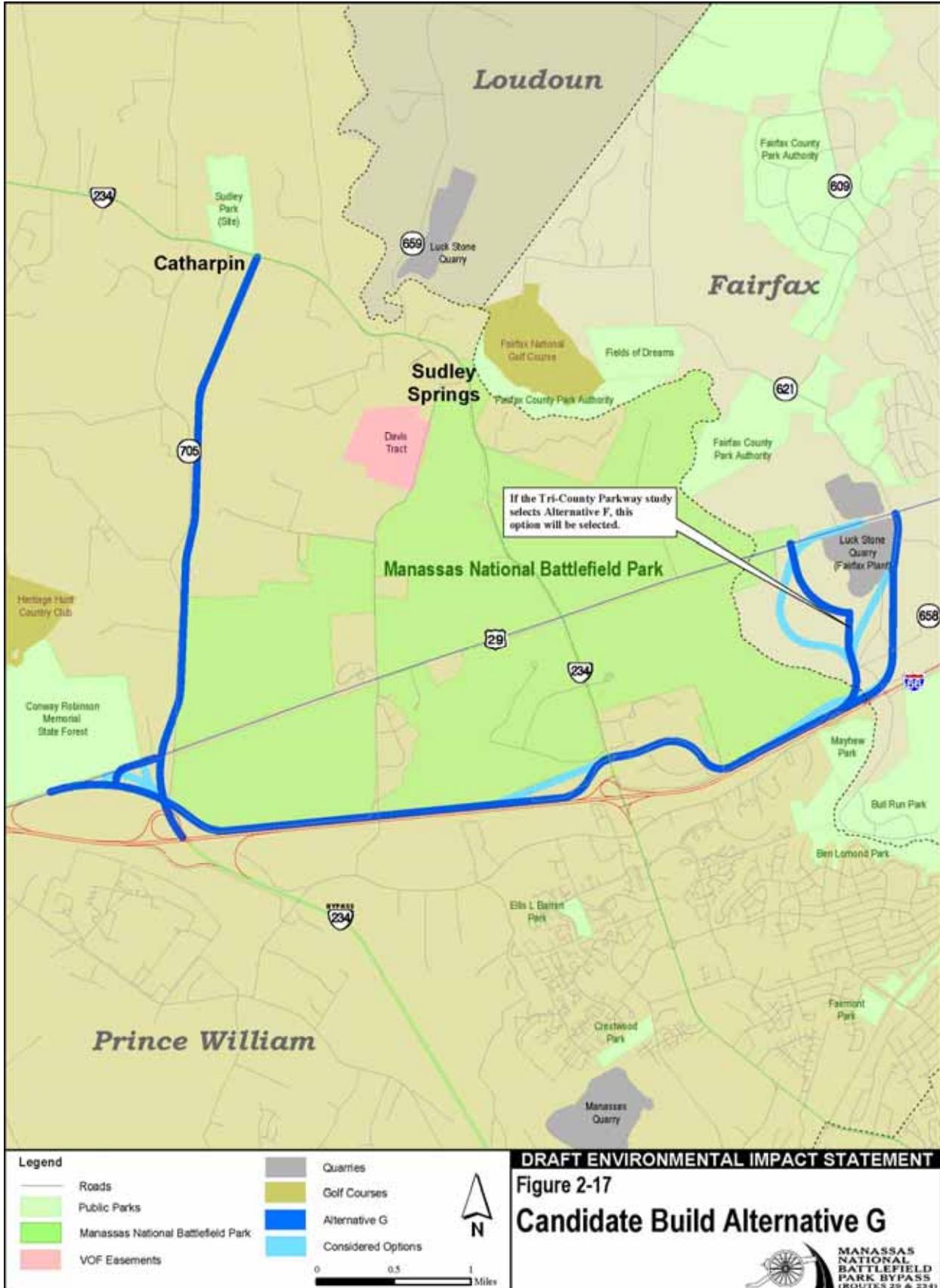
This alternative was developed from Concepts 1, 2, 5, and 5D. This concept begins either on an independent alignment to the west of the Luck Stone quarry on Route 29 or would be co-located on the Tri-County











Parkway west of the quarry and then travel to the north of Field of Dreams and the Fairfax National Golf Course, cross Bull Run and head south along the western boundary of the Davis Tract and along Stony Ridge. The alternative is on new location to the east of Pageland Lane and then is located within the western edge of the Park where it would connect to Route 29 and I-66 at the Route 234 Bypass.

2.4.2 Candidate Build Alternative B

This alternative includes Concept 1 and Concept 2 and could be co-located along a portion of the Route 234 North Bypass Extension and the Tri-County Parkway as discussed below. This alternative is on the same location as Candidate Build Alternative A to a point in Sudley Springs where it would connect to Business Route 234 northwest of the Park. A section of existing Route 234 would be improved under this alternative to a point just east of the Sudley Park site in Prince William County. The alternative then would be co-located with a planned segment of the Route 234 North Bypass Extension that is located to the west of Sudley Mountain Estates. This alternative then is located to the east of Pageland Lane within the Park boundaries on a similar alignment as Alternative A.

2.4.3 Candidate Build Alternative C

This alternative is comprised of Concept 1, Concept 2, a portion of Concept 5 between Route 234 Business, and Concept 2D. East of the Park, this alternative is similar to Candidate Build Alternatives A and B and could be co-located with the Tri-County Parkway as discussed below. Unlike the previous alternatives, this alternative bisects the northeast corner of the Park and crosses Bull Run in three locations. This alternative is located to the south of the Field of Dreams and proceeds between Bull Run and the Fairfax National Golf Course. After the alternative crosses Bull Run into Prince William County, it travels to the south avoiding the Bull Run Overlook neighborhood, and it is on the same alignment as Alternative A.

2.4.4 Candidate Build Alternative D

This alternative is comprised of Concept 1, Concept 2, and Concept 2D. This alternative is a combination of Candidate Build Alternative C that crosses within the Park boundary and below the Field of Dreams and Candidate Build Alternative B that upgrades a portion of existing Route 234 northwest of the Park and is co-located on the Route 234 Bypass North Extension, as discussed below.

2.4.5 Candidate Build Alternative G

This alternative includes Concept 1 and Concept 3A, and would consist of a facility parallel to I-66 between Centreville and Gainesville. It would begin along the east side of the Luck Stone quarry on Route 29, travel southwest and cross Bull Run close to I-66 where it would be located just to the north of I-66. It would continue to parallel I-66 until reaching the east side of the Battleview Business Park near the existing Route 234 interchange where it would run along an improved Battleview Parkway and cross existing Route 234 where the intersection exists today. This alternative would then travel parallel to I-66 until the approach with the existing Route 234 Bypass interchange. At the existing Route 234 Bypass interchange options to connect to the interchange or to Route 29 via fly-over ramps and/or an intersection have been developed. A design option has also been developed east of the Park that would be co-located with the Tri-County Parkway. This alternative also includes a corridor along the proposed Route 234 North Bypass Extension to provide Route 234 movements.

2.5 POTENTIAL CO-LOCATION OPTIONS

Throughout the development of the alternatives, the potential for co-locating with projects that are included in the No-Action Alternative has been considered. Through coordination with the CAB and localities, it was determined that one goal of the study would be to co-locate onto other regional transportation system improvements as closely as possible so as to minimize environmental impacts and reduce costs in this portion of the region. Recognizing that planning for these regional improvements is still underway, this DEIS will assess the potential for co-locating with segments of the Tri-County Parkway and the Route 234 North Bypass Extension, as well as allow for improvements that are planned on I-66.

Placement of Parallel Facility Along I-66

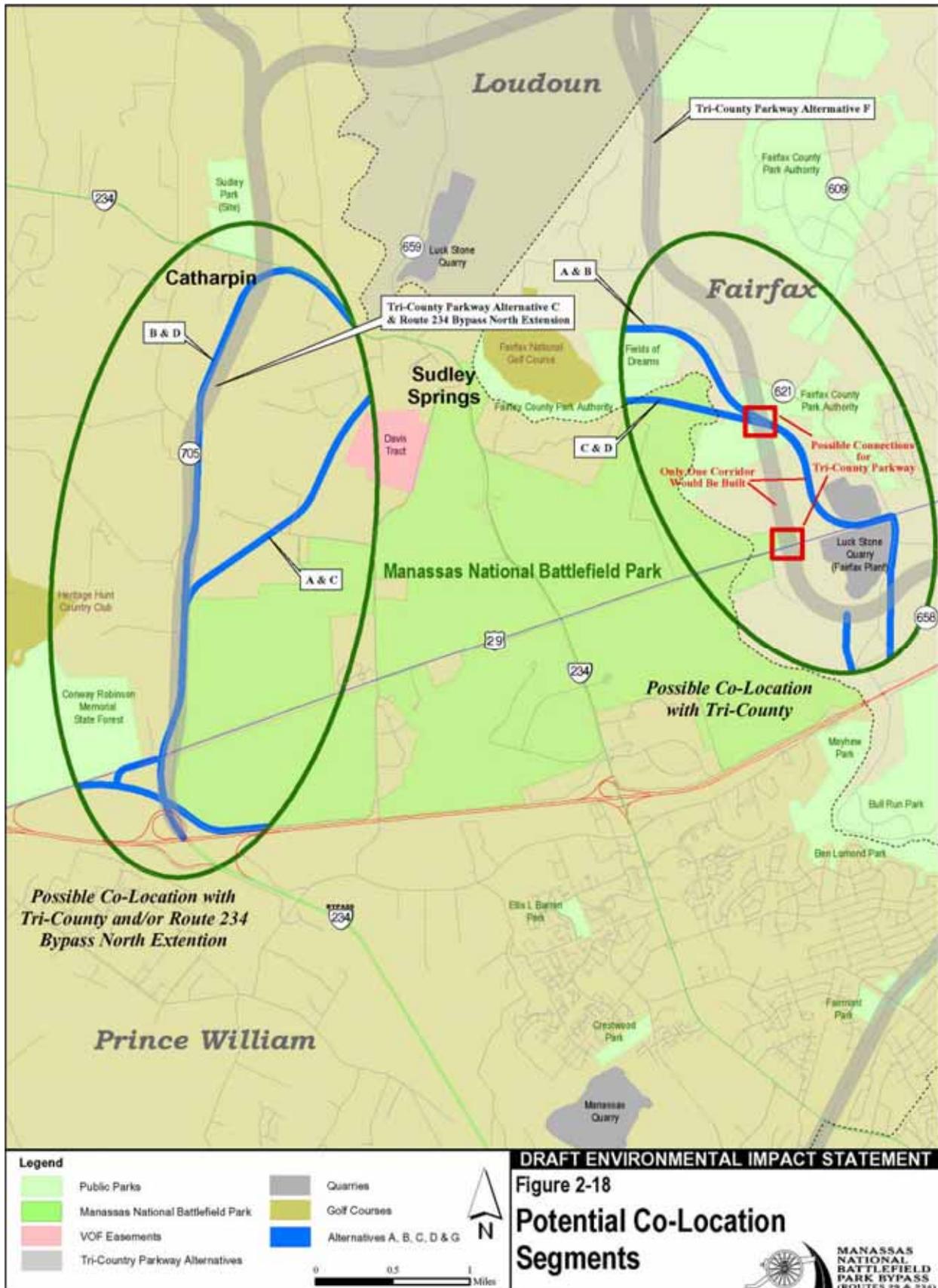
During the alternatives development process, several alternatives made use of a portion of roadway paralleling I-66, either through a frontage road system or separate facility. One concern with these types of facilities is the impact or possible preclusion of widening of the original facility to be paralleled, in this case I-66. Through coordination with VDOT and the *I-66 Multimodal Transportation & Environmental Study* the furthest possible extents of the future I-66 facility were best estimated allowing for the most conservative placement of the proposed facility for the Manassas National Battlefield Park Bypass alternatives. The only remaining facility that may potentially create this situation is Candidate Build Alternative G. Upon completion and the selection of the Preferred Alternative for the *I-66 Multimodal Transportation & Environmental Study*, and if Alternative G is selected as the Preferred Alternative for the Manassas National Battlefield Park Bypass Study, the exact placement of the roadway will be designed such that the two roadways right-of-way extents coincide wherever possible. This could result in lower impacts than those shown in this document, however, for conservative estimates, the placement of the facility at this time is based on this coordination and estimate of the furthest possible extents of the future I-66 facility.

Possible Co-location with Tri-County Parkway

The Candidate Build Alternatives A, B, C, or D are all located to the east of the Park for some portion of their length, as does Tri-County Parkway's (TCP) Alternative F. Both studies have identified the impacts of alternatives and determined, to this point of each study, the best location for alternatives to meet each studies' Purpose and Need while minimizing impacts. These potential locations for the two projects are shown in **Figure 2-18**. From Route 29 near the Wilson Trucking and Mulch business to a point within the newly acquired Fairfax County Park Authority Property or, depending on the preferred alternative, as far north as the proposed Field of Dreams, there would be no need for two distinct roadways.

Tri-County Parkway's proposed roadway would be classified as a Rural Principal Arterial, whereas this study's proposed roadway would be classified as a Rural Minor Arterial, making the TCP Alternative the higher classified facility. Therefore, any bypass alternative would "tee" into TCP where the co-location begins and ends unless traffic modeling determines the need for an interchange to handle volumes or movements. Tri-County Parkway's chosen alignment would be used for this co-location after the completion of their EIS.

In the circumstance that TCP does not choose Alternative F as their preferred alternative, the Bypass study must chose a location for Candidate Build Alternatives A, B, C, or D. The preliminary location of these alternatives does not co-locate onto the TCP alignment north of Route 29. The preliminary location developed as part of the study's alternatives development process is located to the east of the TCP alignment. This current location for the alternatives was determined to best meet the Purpose and Need while minimizing environmental impacts and was refined after the field investigations for the Manassas study were completed.



The locations for the Candidate Build Alternatives A, B, C and D along the east side of the Park were selected (not listed in any specific order):

- To optimize traffic operations and flow by giving priority to the major movement of the continuous Route 29. This means that we used a radius (curve) off of the existing Route 29 was used to smooth the traffic flow. Note: with TCP this would be a “tee” intersection.
- To reduce the impacts to the equestrian center by aligning the alternative so as to avoid the buildings, trails and other facilities to the east and locating the alternative in the least used portion of the parcel which would allow continued use of the property and access to the fields on the west of the property.
- To avoid/minimize impacts to the Manassas National Battlefield Park by only impacting the northeast portion of the Park where minimal activity occurs.
- To minimize impacts to the Fairfax County Park Authority’s newly acquired property by trying to pass through the property in the shortest route possible.
- To avoid / minimize impacts to existing roadways such as Bull Run Post Office Road by only realigning a small portion of Bull Run Post Office Road on Alternatives A and B and avoiding impacts altogether with Alternatives C and D. [Note: TCP would cross Bull Run Post Office Road at least once and possibly replace it completely north of Field of Dreams, impacting access for those properties/residences along it.]

In comparison, the current TCP alternative impacts owned Manassas NBP property along Route 29 that we were directed to avoid due to sensitive cultural resources and Park usage, the Union Ridge Equestrian Center facilities (probably requiring purchase of the entire property), Bull Run Post Office Road (with two crossings that would require grade separations or intersections to maintain local access) and also bisects the Ingersoll property (which may be a development parcel sometime in the future).

If the TCP county study selects a preferred alternative west of the Park, then co-location with that alternative and potentially the Route 234 North Bypass Extension would occur.

Co-location with 234 Bypass North Extension

Figure 2-18 shows the potential for co-locating an alternative with the Tri-County Parkway and the Route 234 Bypass North Extension. The Route 234 Bypass North Extension is proposed as a continuation of the Route 234 Bypass to a point north just east of the Sudley Park site in Prince William County. This proposed extension is included in the No-Action Alternative, the Prince William Comprehensive Plan, and on regional transportation plans. The extension would connect to a relocated Route 659 in Loudoun County.

In order to assess the potential for co-locating with these projects to the west of the Park, a preliminary location was developed since the basic termini between I-66 and existing Route 234 were known and some concepts had been developed through VDOT’s previous studies of relocating Route 234 out of the Park. Again, the goal of co-locating with the Route 234 Bypass Extension project is to minimize potential environmental impacts.

All co-location effects are analyzed in the discussion of Cumulative Effects in Chapter 4 of this DEIS.