



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
and
VIRGINIA DEPARTMENT OF TRANSPORTATION

April 2012

ENVIRONMENTAL ASSESSMENT

ROUTE 501 BRIDGE OVER THE JAMES RIVER

Amherst and Bedford County

Project Number: 0501-005-640, P101, R201, C501, B648

Federal Project Number: BR-005-3(112)



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John Dimkins

For Division Administrator
Federal Highway Administration

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I. PURPOSE AND NEED

Description of the Study Area

The Virginia Department of Transportation (VDOT), in cooperation with the Federal Highway Administration (FHWA), is studying the replacement of the Route 501 Bridge over the James River. The study area is located in Amherst and Bedford Counties near the community of Snowden, and incorporates the existing bridge and associated roadway approaches along Route 501 and Route 130, approximately 0.5 miles northwest of the bridge and one mile southeast of the bridge (see **Figure 1**, Study Area Location). The Route 501 Bridge (hereafter referred to as Snowden Bridge) also traverses the CSX railroad tracks which parallel the James River in the project vicinity.

The Snowden Bridge and roadway approaches on Route 501 and Route 130 are surrounded by upwardly sloping woodland and few residential or commercial structures. The Cushaw Dam is located immediately upstream of the existing bridge, and the Snowden Dam is located downstream of the existing bridge. The Appalachian Trail crosses the James River on a dedicated footbridge approximately 1,000 feet upstream of the Cushaw Dam.

History

The current study is a result of VDOT identifying Snowden Bridge as a priority for replacement due to structural and roadway geometric deficiencies. The Snowden Bridge replacement is funded in VDOT's Six-Year Improvement Program for preliminary engineering, right of way acquisition and construction.

Needs - Existing Conditions

Snowden Bridge is located at an important roadway junction where Route 501 crosses the James River west of Lynchburg. There are two primary roadways in the study area: Route 501 (Big Island Road), and Route 130 (Elon Road). Both roadways roughly parallel the James River through the Blue Ridge Mountains east of Snowden Bridge. Immediately north of Snowden Bridge, the two roadways converge and continue westward toward Glasgow and the Interstate 81 corridor, affording a key link between the Lynchburg vicinity and Interstate 81, and a crucial route for truck traffic over the Blue Ridge Mountains. The bridge location is one of the few crossings of the James River between Lynchburg and Natural Bridge. Both Route 130 and Route 501 are considered primary routes and classified as Rural Minor Arterial.

The existing Snowden Bridge (**Figure 2**) was originally constructed in 1921 and consists of a steel girder-floorbeam-stringer system with six simple spans and a concrete deck. The bridge is

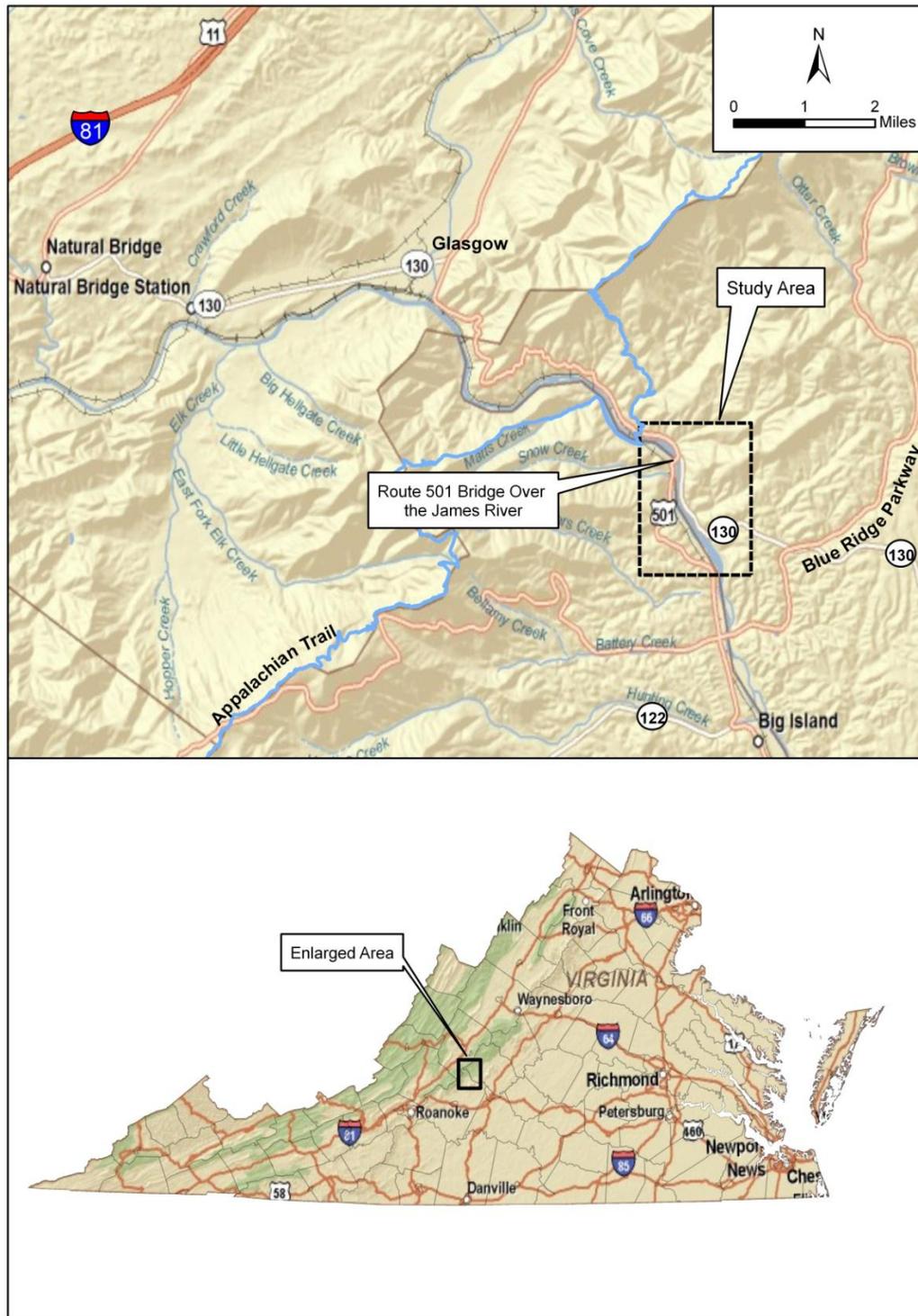


Figure 1: Study Area Location

656' long and 24' wide and is supported on two concrete abutments and five concrete piers. The deck was entirely replaced in 1967, and has been subject to on-going repair and occasional weight restrictions, most recently in 2009.

A bridge inspection completed by VDOT in May 2010 (Appendix A) classified Snowden Bridge as structurally deficient. Structurally deficient bridges are those with deteriorating elements that require the bridge to be monitored and/or repaired, and may be restricted to light weight vehicles or closed to traffic. Both the deck and superstructure of the Snowden Bridge are rated “poor” (rating 4) and the substructure is “fair” (rating 5), both on a scale of 0 to 9 in which 9 is



Figure 2: Snowden Bridge

“excellent condition.” The Snowden Bridge has a number of deficiencies including section loss, corrosion holes in the main girders, and cracked piers and abutments. The bridge sufficiency rating, a measure of the structure’s overall sufficiency to remain in service, was 32.2 on a scale of 0 to 100 with 100 being a perfect score. While the Snowden Bridge is currently open to traffic without any operational restrictions, there have been occasions when restrictions were placed on the bridge when deficiencies required repairs. Further, the bridge inspection report set forth a list of stringent maintenance recommendations to be performed until the structure is replaced, including placing the bridge on a six-month inspection cycle.

Girder-floorbeam-stringer bridges such as Snowden Bridge are inherently non-redundant structures. Two girders form the primary support for each span. If one of these fracture critical members was to fail, the entire span would collapse. Modern practice favors the design of structures with redundancy. In a redundant structure, if one member fails, the entire span or structure does not fail because there are multiple load paths.

The Snowden Bridge is also functionally obsolete. A functionally obsolete bridge is one with deck geometry (e.g., lane or shoulder width), load carrying capacity, clearance, or approach roadway alignment that no longer meets the criteria for the system of which the bridge is a part. The existing bridge carries two 12-foot roadway lanes (one in each direction) and has no shoulders and no sidewalks. This width does not accommodate bicycles or pedestrians, or provide an emergency pull-off area. The existing deck geometry is inconsistent with standards set forth by VDOT and the American Association of State Highway and Transportation Officials, which both recommend a curb-to-curb width of 44 feet (including two 12-foot lanes and 10-

foot shoulders on each side) for this type of rural roadway. The roadway approaches to Snowden Bridge (Route 501/130 southbound, Route 501 northbound, and Route 130 westbound) also have geometric deficiencies in the form of turning radii which are inadequate for trucks. Furthermore, horizontal and vertical alignments are sub-standard south of the existing bridge.

Based on the *Traffic Forecasting and Analysis Report* (Appendix B) prepared for this project in August 2011, the Average Daily Traffic is 1,390 vehicles per day (VPD) (10% trucks) along Route 501 south of Route 130, and 2,139 VPD (10% trucks) along Route 501/130, north of the bridge. Much of the truck traffic is associated with the nearby Georgia Pacific (GP) containerboard manufacturing facility. According to GP plant managers, approximately 80% of the trucks serving the facility use the Snowden Bridge.

Needs - Future Conditions

The Snowden Bridge is expected to continue to deteriorate. Based on the May 2010 inspection, this bridge will continue to require excessive maintenance and repairs at a substantial cost in order to maintain the existing functionality. Between 2007 and 2011, VDOT expended more than \$300,000 on maintenance, repair and inspection of the Snowden Bridge, including \$133,000 for a major structural steel repair in 2009. It is expected that similar major repairs would be required in the future to address ongoing issues with fatigue prone details on the fracture critical structure. Also, over time, weight restrictions may be imposed once maintenance and repairs become ineffective. The two nearest crossings of the James River are more than twenty miles east (Lynchburg) or west (Arcadia) of Snowden Bridge. Future weight restrictions (or closures) would therefore result in a substantial reduction of access and/or an increase in travel times, particularly for trucks.

As discussed in the August 2011 traffic report, traffic (including truck traffic) volumes are expected to remain relatively constant for the foreseeable future with an assumed growth rate of between 0.5% and 1.0% through the design year of 2036. However, roadway geometric deficiencies would also remain the same as today, and the bridge and roadway approaches would continue to be functionally obsolete.

Summary

The purpose of the Route 501 Snowden Bridge Replacement over James River project is to:

- Address structural deficiencies of the functionally obsolete Snowden Bridge; and
- Address roadway deficiencies of the Snowden Bridge and approaches to the bridge.

II. ALTERNATIVES CONSIDERED

This section discusses the process used to develop and screen the alternatives, the range of alternatives considered, the results of the screening process, and the identification of alternatives carried forward for detailed study. Two alternatives, the No-build Alternative and the Preferred Alternative, have been carried forward.

Alternative Development and Screening

The alternative development and screening process involved identifying a range of alternatives initially and then narrowing the alternatives to those carried forward for detailed study. For purposes of developing alternatives, a typical cross section was developed for the proposed bridge and roadway approaches (Route 501 and Route 130 have the same proposed typical section). The proposed typical sections are shown on **Figures 3 and 4**. These sections were used as templates for all build alternatives considered, and were based upon criteria from VDOT Design Standards for a Rural Minor Arterial (GS-2) in mountainous terrain. The project would have the following standard design features:

- **Design Speed:** 55 mph
- **Maximum Grade:** 6%
- **Travel Lanes:** Two 12-foot lanes
- **Graded Shoulders:** 10-foot total, with 8-foot paved (13-foot total width where guardrail is required)
- **Bridge Width:** 44 foot clear width
- **Vertical Clearance at CSX tracks:** Sufficient clearance over the CSX railroad tracks on the west side of the river; and
- **Bridge Clearance over Floodplain:** The alternative should provide sufficient vertical clearance over the river's 100 year floodplain so that the structural steel of the bridge will not be affected by potential flooding.

The screening of conceptual alternatives involved two steps. First, alternatives should address the stated purpose and need for the project:

- **Structural Deficiencies** – The alternative should correct the existing structural deficiencies (i.e. decay of the existing bridge), or replace the existing structure with a new structure.
- **Functional Obsolescence of the Structure** – The alternative should meet all current design standards for the projected traffic volumes, including such elements as lane width and shoulder width.

- **Roadway Deficiencies** – The alternative should meet all current roadway design standards for the projected traffic volumes such as sight distances, pavement width and curve radius.

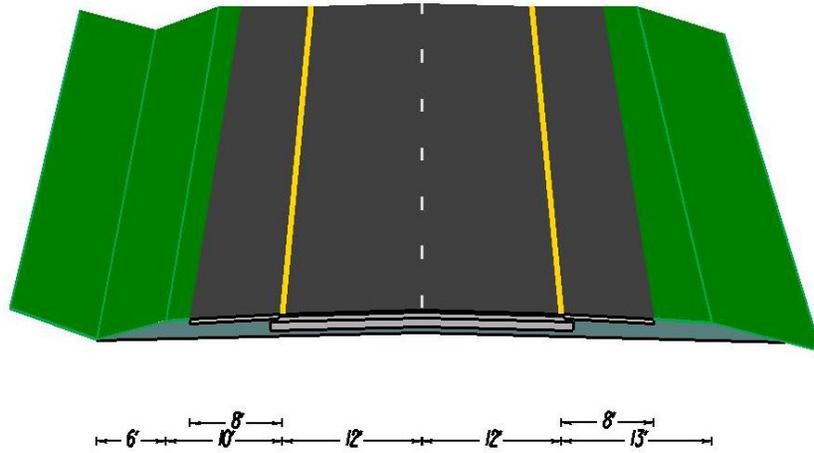


Figure 3: Typical Section for Proposed Bridge Approaches (Routes 501 and 130)

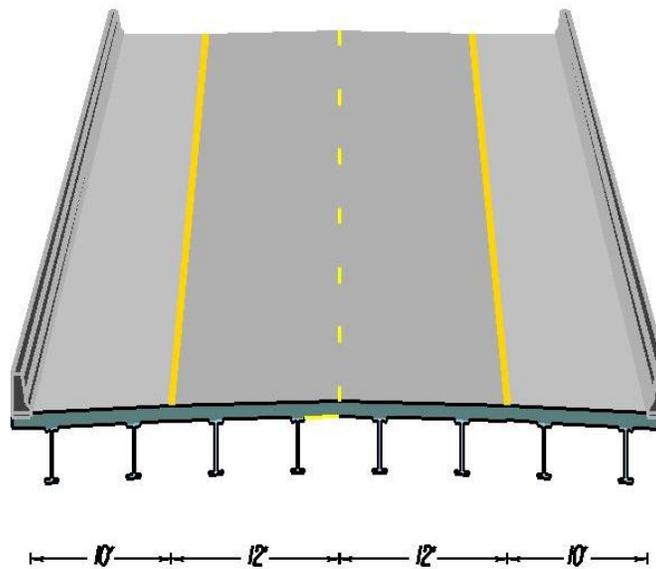
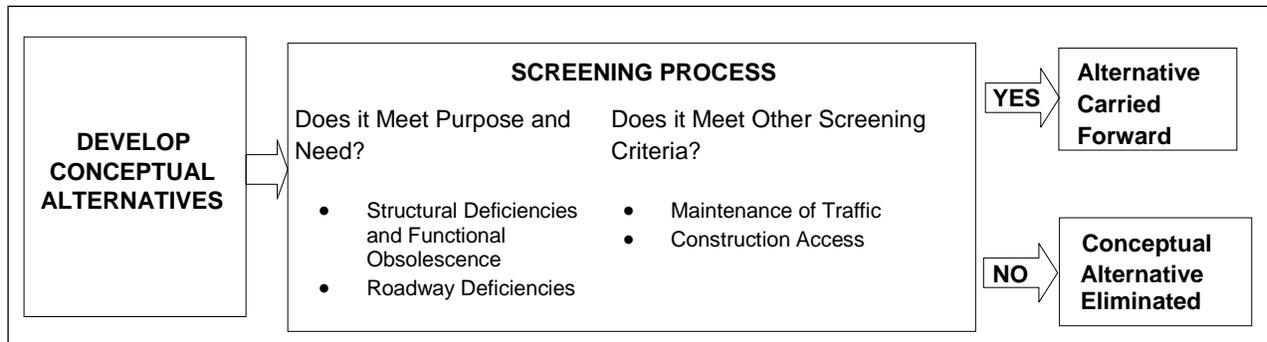


Figure 4: Typical Section for the Proposed Route 501 Bridge

Alternatives that met the purpose and need were further evaluated using the following screening criteria:

- **Maintenance of Traffic** – The alternative should provide for efficient maintenance of traffic, avoiding detours and closures that would impact local traffic.
- **Construction Access and Staging** – The alternative should provide for reasonable access and staging during construction.

The flowchart below illustrates the steps in the alternative development and screening process.



Conceptual Alternatives Considered but Eliminated from Detailed Study

Through the screening process, several conceptual alternatives were eliminated from further consideration and not carried forward for detailed study. **Table 1** lists these alternatives and the reasons for their elimination.

Alternatives Carried Forward

No-Build Alternative

The No-build Alternative serves as a benchmark for alternative comparison. Under the No-build Alternative, the existing bridge over the James River would be maintained and routine repairs or renovations would be made as necessary. There would be no improvements to Route 501 or Route 130 and the existing roads would remain in their present configuration. Given that there are no other planned improvements within the study area, the No-build Alternative represents baseline conditions. This alternative would not satisfy the identified needs to address structural, functional and roadway deficiencies. However, the No-build Alternative was retained as a benchmark for assessing environmental impacts of the Preferred Alternative.

Table 1. Conceptual Alternatives Considered but Eliminated	
Alternative	Basis For Elimination
Rehabilitation of Existing Bridge	This alternative would not address the roadway deficiency needs for the project. The approaches and bridge would not meet current minimum design standards. The fracture critical design would remain and require frequent inspections. Extensive rehabilitation of the existing structure would not be viable due to the existing severe structural deficiencies. Rehabilitation of the existing structure would involve the total reconstruction of the bridge's substructure to provide the necessary width and structural capacity to support a new superstructure. Potential for closings or weight restrictions during construction and in the future would impact maintenance of traffic with no viable detour. Therefore, this alternative would not meet the project purpose and need.
Replacement of Bridge at Existing Location	This alternative would address structural deficiencies and functional obsolescence. However, it would not correct the substandard horizontal curve on the bridge approach south of the river; therefore, this alternative would not meet the project's purpose and need. In addition, this alternative would require closing the bridge for a minimum of two years for construction activities, with no viable detour. Construction access and staging would be difficult due to the steep terrain.
Construction of New Bridge Up River of the Existing Bridge	This alternative would meet the purpose and need of the project. However, meeting the design speed criteria for the new bridge approach would require demolition of the existing bridge to allow for construction of the new facility. Construction of a temporary bridge during construction isn't practicable due to the length of the crossing (700 feet) and the fracture critical condition of the bridge. There would be no viable detours. Construction access and staging would be difficult due to the steep terrain. Construction access would require causeways in the river close to Cushaw Dam and Power Station, potentially impacting the operation of this facility.
Construction of New Bridge Immediately Down River of the Existing Bridge	This alternative would meet the purpose and need of the project. However, the proposed right turn lane on Route 501/130 would overlap with the existing intersection of Routes 501/130, impacting maintenance of traffic at the existing intersection. The construction access and staging for this alternative would be difficult and constrained due to the steep topography along the river as well as the presence of the existing bridge, intersection, and Cushaw Dam.

Preferred Alternative

Description: The Preferred Alternative, as shown on **Figure 5**, begins approximately 0.7 miles south of the existing bridge over the James River, then proceeds in a northerly direction on new alignment crossing the CSX Railroad and the James River. The northern terminus of the proposed bridge ends at an at-grade intersection with Route 130, approximately 0.7 miles east of the existing intersection of Route 501 and Route 130. The intersection of Route 501 and 130 would be redesigned to provide improved traffic operations. Route 130 would be widened at the intersection of the proposed Route 501 to provide a left-turn lane for westbound Route 130 traffic and a right-turn lane for eastbound Route 130 traffic. The length of proposed relocation for Route 501 is 0.3 miles and Route 130 would be widened for 0.3 miles. The proposed profile grade for the bridge would be 5.7%. The existing bridge would be demolished and removed.

For environmental analysis purposes, the study corridor is 200 feet wide (approximately 100 feet from each side). The actual width of the required right-of-way would be determined during final design. The length of this corridor is approximately 0.6 miles and the total area within the 200-foot wide corridor is approximately 15 acres.

Benefits of Preferred Alternative: Contrary to the conceptual alternatives eliminated from further consideration which would require bridge closures and detours during construction, the Preferred Alternative would allow for effective maintenance of traffic, and detours and closures of the existing bridge would not be necessary. The location of the new intersection at the northern terminus of the bridge would not conflict with the operation of the existing intersection. Compared to the other alternatives considered, the Preferred Alternative would minimize impacts on traffic.

The Preferred Alternative would provide better construction access and staging than the other conceptual alternatives. There is a wide (200+ feet), relatively flat area along Route 130 at the northern terminus of the proposed bridge where construction access and staging could be facilitated. At this location, the elevation difference between Route 130 and the James River is only 25 feet, thus providing reasonable construction access to the river from the adjacent shoreline. The conceptual alternatives eliminated from further consideration would have required difficult construction access and staging. Unlike the Preferred Alternative, the other conceptual alternatives do not have access to a relatively level staging area adjacent to the river. In addition, under the conceptual alternatives eliminated there is a 50+ foot difference in elevation between the roadway and the river, which would increase the difficulty of construction access to the river.

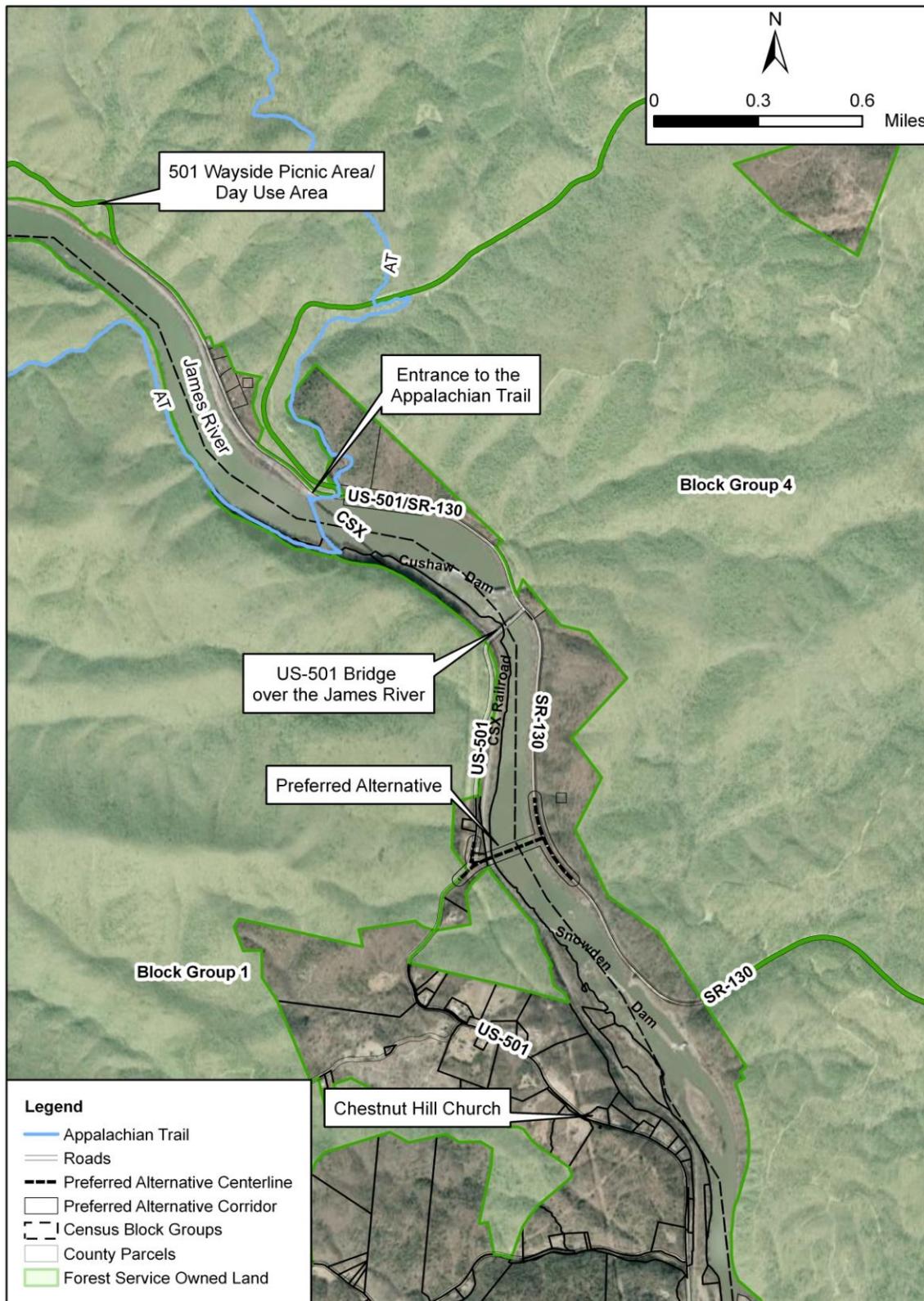


Figure 5: Preferred Alternative

The Preferred Alternative would meet the identified transportation needs for the project. It would be built to meet current roadway and structural standards, and would address all of the structural, functional and roadway deficiencies. The Preferred Alternative would not require detours or bridge closures during construction, and would have efficient construction access and staging.

Cost: The total estimated preliminary engineering and construction cost of the Preferred Alternative is \$7.2 million. Year 2014 Advertisement was assumed for the construction estimate. The estimated right-of-way and utility relocation cost is \$0.2 million (Year 2016).

III. ENVIRONMENTAL CONSEQUENCES

The purpose of this section is to identify and analyze the environmental consequences resulting from the proposed project. The following assessment of the environmental consequences is focused on the study area of the proposed project. For the purpose of evaluating environmental impacts, a study corridor was delineated which extends 100 feet from each side of the Preferred Alternative centerline (total width of 200 feet). **Table 2** summarizes environmental impacts for the No Build Alternative and for the Preferred Alternative based on this corridor width.

Table 2: Summary of Impacts		
Category	Impacts (Approximate)	
	No Build Alt.	Preferred Alt.
Residential Displacements (No.)	0	1*
Residential Property (acres)	0	4
Businesses Displaced (No.)	0	0
Community Facilities (No.)	0	0
Forest Service Land (acres)	0	0
Environmental Justice Populations (No.)	0	0
Farmland or Farmland Soils (acres)	0	0
Historic Properties (No.)	0	0
Waters of the U.S. (linear feet bridged)	0	1,000
Wetlands (acres)	0	0
Forest (acres)	0	10
Floodplains (acres filled/acres cleared)	0	0.5 / 6
Threatened and Endangered Species (No.)	0	0
Hazardous Materials Sites Impacted (No.)	0	0
Noise (No. of Receptors Impacted)	0	0
Section 4(f) Properties (No.)	0	0

*Residence is abandoned

Potential environmental impacts of the Preferred Alternative are described in the following paragraphs. Except where noted, the No-Build Alternative would not impact environmental resources. VDOT completed several technical documents which are available upon request and include the *Snowden Bridge Traffic Report*, the *Land Use and Socio-Economic Technical Memorandum*, the *Natural Environmental Technical Memorandum*, the *Hazardous Waste Technical Memorandum*, the *Noise Analysis Technical Report* and the *Cultural Resources Identification Surveys*, which provide additional information regarding existing conditions in the study area and impacts of both alternatives. **Figure 6** shows environmental features of the study area.

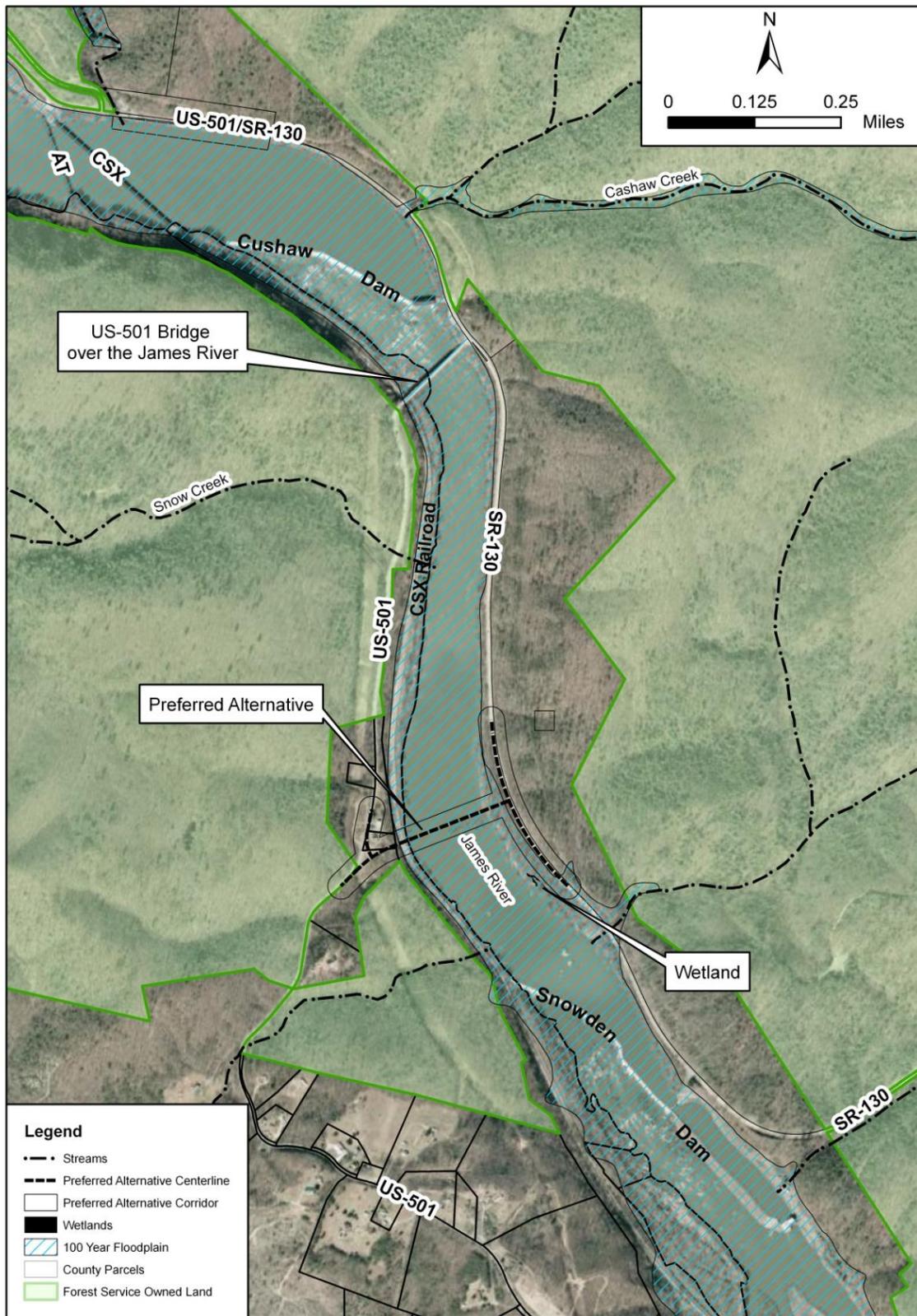


Figure 6: Environmental Features

Right of Way and Relocations

The Preferred Alternative would impact three residential properties (labeled as Parcels 1, 2 and 4 on **Figure 7**). All of Parcel 2 (0.7 acres) would be acquired for the Preferred Alternative right-of-way; however, the residence on this property is abandoned, and no displacement would occur.

Right-of-way would also be required from Parcels 1 and 4, both of which are inhabited. The residents of these properties would not be displaced, as the Preferred Alternative would only impact a portion of their properties. The Preferred Alternative would affect approximately 2.6 acres of the 11.0 acres of Parcel 1, and 0.5 acres of the 2.1 acres of Parcel 4. It is anticipated that these impacts would decrease during detailed design. The Preferred Alternative roadway alignment in front of these residences would be in approximately the same location as the existing roadway.

On the east side of the James River in Amherst County, impacts would be limited to approximately four acres of property owned by the City of Bedford and located between Route 130 and the James River. It is anticipated that only 0.5 acres would be impacted by the bridge or fill slopes from Route 130 with the remainder used for construction staging and access.

The acquisition of property and the relocation of residents, businesses, farms, and non-profit organizations, if needed, will be conducted in accordance with all applicable Federal laws, regulations and requirements, including but not limited to, 23 CFR Part 710, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended and its implementing regulations found in 49 CFR Part 24. All persons displaced on Federally-assisted projects will be treated fairly, consistently, and equitably so that they do not suffer disproportionate injuries as a result of projects that are designed for the benefit of the public as a whole. Relocation resources will be available to all residential and business relocatees without discrimination.

Community Facilities

The following community facilities exist within the study area (**Figure 5**):

- Appalachian Trail, including a trailhead parking area
- Route 501 wayside picnic/day use area
- Chestnut Hill Church

Aside from the Appalachian Trail, no pedestrian or bicycle facilities exist or are planned within the study area. Other community facilities such as schools, hospitals and fire departments are

not located within the study area. The Preferred Alternative would not impact community facilities.

The Preferred Alternative is located between Cushaw Dam (upstream) and Snowden Dam (downstream), which are operated by Dominion Virginia Power. Implementation of the Preferred Alternative would not impede the flow of the river, and therefore would not impact operation of the dams.

Land Use

The study area is rural. Land use surrounding the Preferred Alternative consists primarily of undeveloped forest land within the George Washington and Jefferson National Forests, which are administered by the US Department of Agriculture (USDA) Forest Service (**Figure 7**). There are no designated Agricultural and Forestal Districts in the study area. Most of the Preferred Alternative is on land used for roadway right-of-way and owned by the City of Bedford. A small portion of the Preferred Alternative is located on residential land.

According to the George Washington and Jefferson National Forest Plans, the Forest Service land that comprises part of the study area is partially within the James River Face Wilderness Addition, which is characterized as both an Inventoried Roadless Area (IRA) and a Wilderness Study Area (WSA). A WSA is defined as land designated by Congress for further study prior to final Wilderness designation. An IRA is defined as an area identified in a set of inventoried roadless area maps created by directive of the Roadless Area Conservation Rule (36 CFR Part 294). Pursuant to the Jefferson National Forest Revised Land and Resource Management Plan (Forest Plan) as well as the Roadless Area Conservation Rule, the James River Face Wilderness Addition is to be managed in the same manner as congressionally designated Wilderness. Under the Wilderness Act of 1964 and applicable USDA Forest Service regulations, Wilderness is land designated by Congress as undeveloped, without permanent improvements (such as roads) or human habitation, and is protected and managed to preserve its natural conditions. The Preferred Alternative would not encroach upon the James River Face Wilderness Addition, and no impact to the IRA/WSA would occur.

Based on County GIS Parcel data approximately 0.6 acres of the George Washington and Thomas Jefferson National Forests are located within the Preferred Alternative corridor (**Figure 7**). VDOT has undertaken coordination efforts with the Forest Service, including providing George Washington and Jefferson National Forest management staff all applicable environmental analyses and technical documents to enable the Forest Service to provide meaningful input into the project.

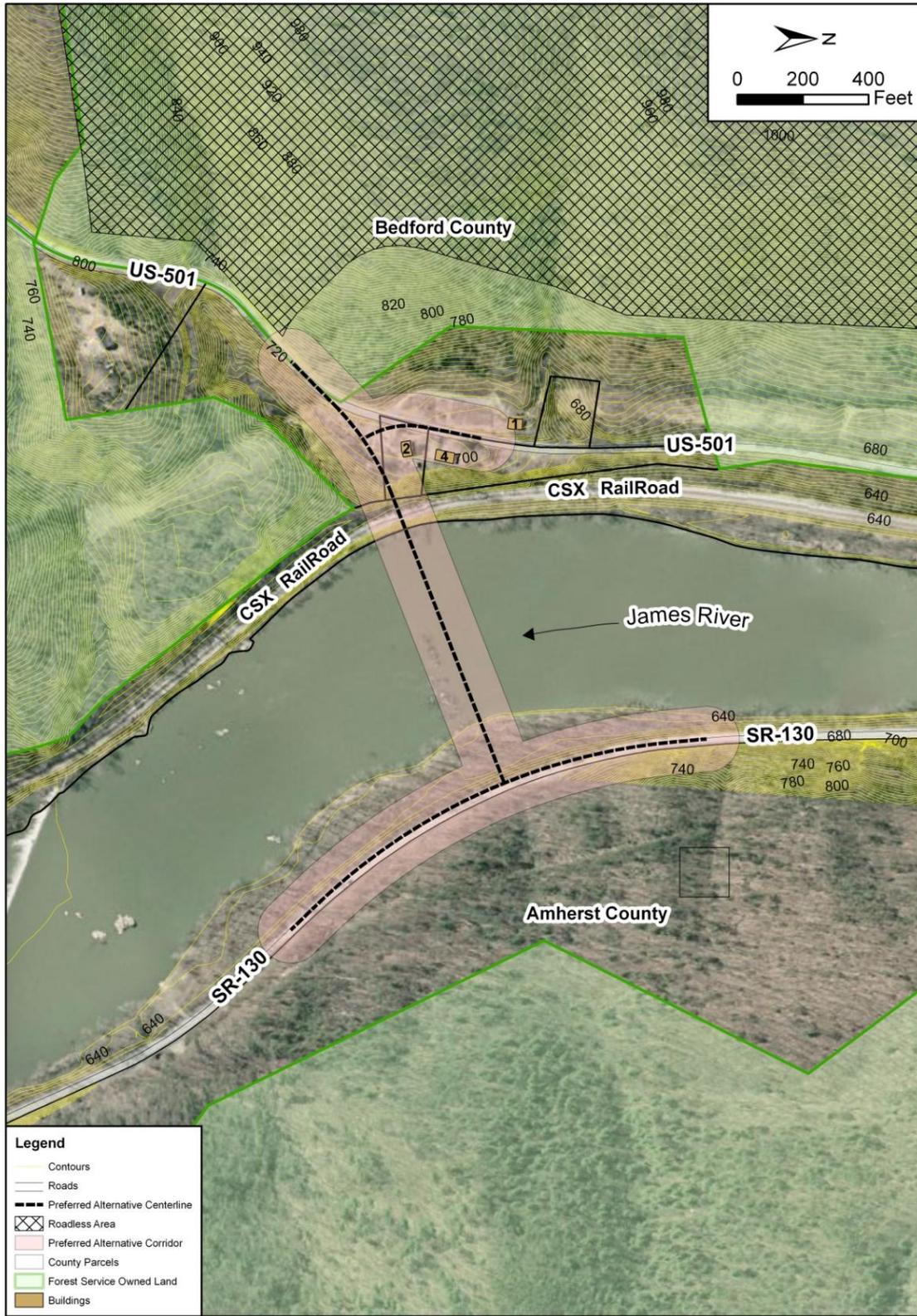


Figure 7: Properties

Although National Forest land is partially within the project corridor, improvements in this area would be located south of Route 501; thus, no project-related activities, including staging and construction, would occur on land administered by the Forest Service. Implementation of the Preferred Alternative would not result in impacts to land use within the George Washington and Jefferson National Forests.

Implementation of the Preferred Alternative would not change existing or proposed land use in the study area. The Preferred Alternative does not conflict with the Amherst County Comprehensive Plan (2008) or the Bedford County 2025 Comprehensive Plan (2007).

Economic Conditions

Economic activity in the study area is limited. However, the Georgia Pacific (GP) Big Island containerboard facility is located adjacent to Route 501, along the southwest bank of the James River, south of the Preferred Alternative. Raw material and finished product are transported to and from the facility by truck. Because of the circuitous nature of other routes, approximately 80% of trucks travel to the facility via the existing Route 501 bridge.

Under the No Build Alternative, additional weight restrictions and/or future bridge closures could force trucks (including trucks traveling to the GP facility) to detour from their most time-efficient and economical route. Because the two nearest truck crossings of the James River are more than twenty miles from Snowden Bridge, the No-Build Alternative would result in negative economic impacts caused by less efficient freight transport. Similarly, should a future bridge closure occur, the No-build Alternative would affect travel times for commuters traveling to economic centers between Amherst County and Bedford County.

Implementation of the Preferred Alternative would have no negative impact on economic conditions. The Preferred Alternative would provide an economic benefit by facilitating continued truck crossing of the James River over a commonly preferred route.. Access to and from the study area would be maintained during construction, and trucks and commuters would not incur costly and/or onerous detours.

Environmental Justice

This project has been developed in accordance with Title VI of the Civil Rights Act of 1964 as amended in 1968, and Executive Order 12898. Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs Federal agencies to identify and address disproportionately high and adverse human health or environmental effects that its programs, policies and activities may have on minority and low-income populations. The VDOT definition of Environmental Justice states “Environmental

Justice assures that services and benefits allow for meaningful participation and are fairly distributed to avoid discrimination.”

According to DOT Order 6640.23 “FHWA Actions to address Environmental Justice in Minority Populations and Low-Income Populations,” minority and/low low-income populations are defined as “any readily identifiable groups of minority and/or low-income persons who live in geographic proximity...” (FHWA, 1998). Given the limited number of residents in the study area, a minority or low income “population” is not evident. Furthermore, data from the U.S. Census Bureau, the National Center for Educational Statistics and the U.S. Department of Housing and Urban Development (HUD) do not identify a low-income or minority population within the study area. Therefore, the Preferred Alternative would not cause disproportionately high or adverse impacts.

Farmland

The Farmland Protection Policy Act (FPPA) sets forth federal policies to prevent the unnecessary conversion of agricultural land to non-agricultural use. Pursuant to the FPPA, Form AD 1006, Farmland Conversion Impact Rating, was submitted to the Natural Resources Conservation Service’s (NRCS) District Conservationist. NRCS responded on July 12, 2011 that no Prime Farmland, Unique or other Important Farmland is present in the study area or would be impacted by the Preferred Alternative.

Historic Properties

Section 106 of the National Historic Preservation Act of 1966, as amended, requires federal agencies to consider the effects of their actions on historic properties. Historic properties are archaeological sites and historic buildings, structures, objects, and districts that are listed in or eligible for listing in the National Register of Historic Places. Pursuant the regulations implementing Section 106 of the National Historic Preservation Act, archeological and historic structure surveys were conducted to identify historic properties located within the project’s Area of Potential Effect. These surveys identified no historic properties. The Virginia Department of Historic Resources concurred February 3, 2012 that there will be no historic properties affected by the Preferred Alternative.

Surface Waters and Water Quality

As shown on **Figure 6**, surface waters in the study area consist of the James River, Cashaw Creek, Snow Creek, and several unnamed tributaries to these watercourses. In 2010, the Virginia Department of Environmental Quality (DEQ) determined that the portion of the James River within the study area supports aquatic life, wildlife and recreation. However, DEQ categorized the same portion of the James River as impaired, because it fails to meet state water quality standards for fish consumption due to mercury in fish tissue. DEQ does not consider the remaining surface waters in the study area to be impaired.

As shown on **Figure 6**, the Preferred Alternative would cross the James River and an ephemeral channel near the southern project terminus on Route 130. Current impacts to water quality result from pollutants from the existing bridge and road surfaces being washed into streams during precipitation events. Typical transportation related pollutants include grease, oil, metals, nutrients, nitrogen, deicing salts, roadside vegetation management chemicals, and suspended solids. Under the Preferred Alternative, these impacts are likely to continue as existing conditions. However, because minimal increase in traffic volume is anticipated to result from implementation of the Preferred Alternative, no increase in pollutant runoff or impacts to water quality are expected.

Moreover, temporary and permanent stormwater management measures, such as vegetative controls and other measures, would be implemented to minimize potential degradation of water quality. These measures would reduce or detain discharge volumes and remove most pollutants. During project design, VDOT and DEQ guidance will be followed to identify appropriate stormwater management measures. Because removal of the existing bridge would offset the impervious surface added by the Preferred Alternative, large control measures such as detention basins are not anticipated.

The Preferred Alternative would bridge over approximately 950 linear feet of the James River (Waters of the US). It is anticipated that the project would require permits by the U.S. Army Corps of Engineers (USACE) and/or Department of Environmental Quality (DEQ). Project impacts will be quantified with the development of final plan and during the permit applications process. At that time the USACE and VDOT will negotiate minimization and mitigation methods as part of the permitting process and in accordance with 23 CFR 777.9

Wetlands

Field investigations were conducted in September 2011 to determine whether wetlands are present within the study area. The results of this investigation are summarized in the Natural Resources Technical Memorandum. The wetland identified in the study area is located in the floodplain of the James River, approximately 110 feet from Route 130 and over 700 feet downstream from the Preferred Alternative (see **Figure 6**). Thus, there would be no impacts to wetlands.

Floodplains

Executive Order 11988, *Floodplain Management*, requires that federal agencies locate facilities outside the 100-year or base floodplain, unless there is no practicable alternative location.

Information on floodplains in the study area was obtained from the Federal Emergency Management Agency (FEMA) Map Service Center. As shown on **Figure 6**, the 100-year

floodplains within the study area are associated with the James River and Cashaw Creek. There are approximately 6 acres of 100-year floodplains within the Preferred Alternative corridor. The project would cross the 100-year floodplain associated with the James River and require 0.5 acres of fill in the floodplain. Approximately 3-5 acres of floodplain forest adjacent to Route 130 would be cleared on the east side of the James River to provide construction access.

The Preferred Alternative would not cause an increase in flood elevation levels, and would not cause floodplain encroachments that would increase the probability of flooding, the potential for property loss, or hazard to the life span of the bridge. The bridge also would be designed so that the span would remain above the 100-year floodplain elevation. Although the piers of the Preferred Alternative would be within the floodplain, the piers of the existing bridge, also located within the floodplain, would be removed, thereby offsetting the placement of the new piers and ensuring that there would be no change to existing flood risk.

Based on the above, the Preferred Alternative is consistent with EO 11988. The floodplain encroachments would not be “significant encroachments” under 23 CFR 650.105(q) because:

- They would pose no significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or that provides a community’s only evacuation route;
- They would not pose significant flooding risks; and
- They would not have significant adverse impacts on natural and beneficial floodplain values.

Wildlife and Habitat

The study area encompasses both aquatic and terrestrial habitats, and their associated fauna. The major aquatic resource in the area is the James River. Snow Creek, Cashaw Creek, and several unnamed tributaries to these watercourses also are located in the study area. A variety of aquatic species, including bivalves, finfish, reptiles, amphibians, and aquatic birds reside in the surface waters in the study area. There are several terrestrial habitats in the study area, including mixed hardwood forests, roadside clearings, and power lines. These habitats are occupied by a variety of birds, mammals, reptiles, amphibians, and plants. The Virginia Department of Conservation and Recreation – Division of Natural Heritage (DCR-DNH) identified two habitats of natural heritage concern in the project vicinity: the Piedmont/Mountain Floodplain Forest and the Riverside Prairie. There are no wildlife refuges within the study area.

The September 2011 field visit revealed that the eastern shore of the James River contains a wide floodplain, which matches the description of the Piedmont/Mountain Floodplain Forest habitat. The western shoreline is steep and rocky, with little to no floodplain. Topography in the study area ranges from relatively flat to steep.

The Preferred Alternative would clear approximately 3-5 acres of Piedmont/Mountain Floodplain Forest along the James River. As a result, there would be impacts to wildlife which reside or otherwise use this habitat. However, populations of species would not be significantly affected. Plant species cleared from the study area would be gradually repopulated from other nearby individuals; and animal species which leave the impacted area during construction would likely return when construction is complete. Any habitat permanently impacted would be replaced by removal of the existing bridge.

Threatened and Endangered Species

According to an August 2011 review of the US Fish and Wildlife Service's online Information, Planning and Consultation (IPaC) system, four federally-protected species may exist in proximity to the study area. They are the endangered James spiny mussel (*Pleurobema collina*) and Roanoke logperch (*Percina rex*), and the threatened small-whorled pogonia (*Isotria medeoloides*) and swamp pink (*Helonias bullata*). However, VDOT has determined that implementation of the project will have no effect to these species as described below:

- The presence of the two dams and a silty substrate on the river bottom in the study corridor are not suitable habitat for the James spiny mussel. Due to the absence of habitat, there will be no effect on this species or its habitat.
- The Roanoke logperch does not occur in the James River basin, and therefore there will be no effect on this species.
- Suitable habitat for small-whorled pogonia does not exist within the study area. Due to the absence of habitat, there will be no effect on this species or its habitat.
- Swamp pink is not known to occur in Amherst or Bedford Counties and there is no suitable wetland habitat within the study corridor. Due to the absence of the species and its habitat, there will be no effect on this species or its habitat.

An August 2011 search of the Virginia Department of Game and Inland Fisheries' online VaFWIS database indicated that the state-threatened green floater (*Lasmigona subviridis*) has been confirmed within two miles of the study area. The habitat for this bivalve generally consists of fast-flowing clean water with relatively firm substrates swept free of siltation. The silty river

bottom in the study area does not provide suitable habitat. Therefore, the Preferred Alternative would not impact this species.

In its response to VDOT's scoping letter, the DCR-DNH stated on June 29, 2012 that the project will not affect any documented state-listed plants or insects.

Hazardous Materials

Environmental Data Resources (EDR) was retained to perform a search of Federal and State regulatory agency databases for the study area and the surrounding vicinity to identify potential hazardous materials. The EDR report did not identify sites of known environmental concern or regulation. Based on this database search, the Preferred Alternative would result in negligible risk of encountering hazardous materials.

All solid waste material resulting from clearing and grubbing, demolition, or other construction operations would be removed and disposed of in a legal manner. If hazardous materials were to be discovered at the project site during implementation of the Preferred Alternative, project activity will stop until a contingency plan designed to mitigate the impact of the hazardous materials would be developed and instituted.

Air

An air quality analysis was completed for the study and is included in the *Air Quality Technical Report*. Both Amherst and Bedford Counties are in attainment for all criteria air pollutants (EPA, 2011). The Preferred Alternative would result in minimal increases in vehicular traffic, and therefore no impacts to air quality would result.

Noise

Federal Highway Administration (FHWA) regulations for mitigation of highway traffic noise in the planning and design of federally aided highway projects require that a noise impact analysis be performed when a roadway would be constructed in a new location. VDOT completed a Noise Analysis Technical Report in November 2011 to identify sensitive noise receptors, existing noise levels, and project-related noise from the Preferred Alternative. Based upon the noise analysis, no substantial increases in noise levels are expected, and traffic noise levels under the Preferred Alternative would not exceed FHWA's Noise Abatement Criteria for residential land uses. Thus, the Preferred Alternative would not result in noise impacts to any sensitive receptors.

Section 4(f)

Section 4(f) of the U.S. Department of Transportation Act of 1966, as amended (49 USC 303 et seq.; 23 CFR 774), protects publicly owned parks, recreation areas, wildlife or waterfowl

refuges, or public or private historic sites on or eligible for the National Register of Historic Places.

National Forests are multiple-use public land holdings that serve many functions, including timber management, recreation, and wildlife habitat. Although the project corridor contains National Forest land, the land within the corridor is not protected under Section 4(f) because it is not specifically designated for park, recreation, or wildlife and waterfowl refuge purposes (23 CFR 774.11(d)). As the official with jurisdiction, the US Forest Service concurred on March 22, 2012 that Section 4(f) is not applicable to the land within the project corridor. Furthermore, no project-related activities, including staging and construction, would occur on National Forest land. The Preferred Alternative would therefore not require the Section 4(f) use of the George Washington National Forest. There are no other Section 4(f) properties in the study area.

Section 6(f)

Section 6(f) of the Land and Water Conservation Fund Act (LWCFA) concerns projects that propose impacts to or the permanent conversion of, outdoor recreation property that was acquired or developed with LWCFA grant assistance. Section 6(f) does not apply to the Preferred Alternative because no such funds were used to purchase or develop any of the affected properties.

Invasive Species

In accordance with Executive Order 13112, *Invasive Species*, the potential for the establishment of invasive terrestrial or aquatic animal or plant species during construction of the proposed project will be minimized by following provisions in VDOT's *Road and Bridge Specifications*. These provisions require prompt seeding of disturbed areas with mixes that are tested in accordance with the Virginia Seed Law and VDOT's standards and specifications to ensure that seed mixes are free of noxious species. While the proposed right of way is vulnerable to the colonization of invasive plant species from other portions of the site and from adjacent properties, implementation of the stated provisions will reduce the potential for the establishment and proliferation of invasive species.

Construction and Temporary Impacts

The requirements and special conditions of any permits for work in and around surface waters will be incorporated into the construction contract documents. The construction contractor will be required to comply with those conditions and with pollution control measures contained in VDOT's 2007 *Road and Bridge Specifications*. No construction-related impacts to water quality would result from implementation of the Preferred Alternative.

Air quality impacts from construction, consisting of emissions from diesel-powered construction equipment and fugitive dust, would be temporary. The project would comply with all applicable local, state, and federal regulations, including the Virginia Environmental Regulations 9 VAC 5-40-5600 et seq. regarding open burning and 9 VAC 5-50-60 et seq. regarding fugitive dust emissions. Standard dust control practices, such as spraying with water, would be implemented, and measures would be taken to minimize exposed earth by stabilizing with grass, mulch, pavement, or other cover as early as possible.

Applicable construction noise provisions are found in Section 107.16(b)(3) of the *Road and Bridge Specifications*. All construction activities would be undertaken in accordance with these specifications. Any construction-related impacts in terms of noise would be temporal and minor in nature, and would cease upon completion of construction.

Indirect Impacts

The Council on Environmental Quality (CEQ) defines indirect effects as effects that "...are caused by the [proposed] action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems" (40 CFR 1508.8(b)). Most commonly, indirect impacts associated with transportation infrastructure projects are related to induced development, i.e., development that would not occur if the project were not constructed.

Implementation of the Preferred Alternative is not expected to result in increased use of the Route 501 James River crossing. Without such increased use, it is unlikely that the project would induce growth. Further, the proposed study area is bounded on both sides by land administered by the USDA Forest Service. Use of these lands is governed by the George Washington National Forest Plan and the Thomas Jefferson National Forest Plan. No development is likely to occur under these Forest Plans, with or without implementation of the Preferred Alternative. Likewise, the decision to replace or not replace the existing Route 501 bridge has no bearing on the National Forest planning process. As such, implementation of the Preferred Alternative would not change area land use or have any growth-inducing effect. The Preferred Alternative would therefore not cause indirect impacts related to development.

Indirect impacts also may include effects that are further removed in time or space than direct effects. Such impacts may include water quality (e.g., stormwater runoff) or floodplain effects that result from the construction of the new bridge. Implementation of the Preferred Alternative entails the replacement of a bridge (i.e., trading one source of stormwater runoff for another). In addition, stormwater runoff from the Preferred Alternative will be treated in

accordance with DCR requirements, as discussed previously. Thus, no indirect impacts related to downstream effects are anticipated from the Preferred Alternative.

Cumulative Impacts

The Council on Environmental Quality (CEQ) defines cumulative impacts as "...impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7).

Based upon a review of local land use plans including the George Washington National Forest Plan, the Thomas Jefferson National Forest Plan, the Amherst County Comprehensive Plan and the Bedford County 2025 Comprehensive Plan, no other reasonably foreseeable future actions are expected to be undertaken by VDOT or other public or private entities, either in the short or long term, in the study area. Therefore, implementation of the Preferred Alternative would not result in cumulative impacts.

IV. COORDINATION AND COMMENTS

Agency Coordination

In the process of preparing this document, the federal, state, and local agencies listed below were consulted to obtain pertinent information and to identify key issues regarding potential environmental impacts.

- US Environmental Protection Agency
- Natural Resources Conservation Service
- US Army Corps of Engineers
- US Department of the Interior, Office of Environmental Policy & Compliance
- Federal Railroad Administration
- USDA Forest Service
- Virginia Department of Agriculture and Consumer Service
- Virginia Department of Conservation and Recreation
- Virginia Department of Environmental Quality
- Virginia Department of Game and Inland fisheries
- Virginia Department of Health, Office of Drinking Water Programs
- Virginia Department of Historic Resources
- Virginia Department of Mines, Minerals, and Energy
- Virginia Marine Resources Commission
- Virginia Outdoors Foundation
- Virginia Department of Rail and Public Transportation
- Virginia Department of Forestry
- Amherst County
- Bedford County
- City of Bedford
- Dominion Virginia Power

Public Involvement

VDOT will hold a location and design public hearing for this project. The purpose of this hearing will be to present the preliminary project design and the findings of this Environmental Assessment (EA) and to obtain input and comments from the community. The EA will be made available for public inspection prior to and at the hearing. There will be a minimum of 30-day public comment period following notice of availability of the Draft EA. Any comments received during the public hearing and public comment period will become part of the public hearing

record. All comments received on the Draft EA will be considered, and all substantive comments will be address in writing.

V. REFERENCES

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