

Feasible and Prudent Avoidance Alternative Analysis

1.0 Introduction

As discussed in the Draft Section 4(f) Evaluation, the VT 2A and Hybrid Alternatives would require the use of multiple Section 4(f) resources. The Circ A/B Alternatives do not require the use of Section 4(f) resources. The purpose of this analysis is to determine if one or more of the Circ A/B Alternatives is a feasible and prudent avoidance alternative, as defined by FHWA's Section 4(f) regulations (23 CFR 774).

The feasible and prudent avoidance alternative evaluation includes a balancing test between impacts to different types of resources, but the balancing test is weighted in favor of avoiding the use of Section 4(f) resources. Section 4(f) and non-Section 4(f) resource impacts are not weighted on an equal basis; there is always a "thumb on the scale" in favor of avoiding the Section 4(f) resource impacts. "A feasible and prudent avoidance alternative avoids using Section 4(f) property and does not cause other problems of a magnitude that *substantially* outweighs the importance of protecting the Section 4(f) property. In assessing the importance of protecting the Section 4(f) property, it is appropriate to consider the relative value of the resource to the preservation purpose of the statute" (23 CFR 774.17, definition of feasible and prudent avoidance alternative, emphasis added).

Section 1.1 describes the Section 4(f) resources that are used by the VT 2A and Hybrid Alternatives. Section 1.2 describes the non-Section 4(f) resource impacts of the VT 2A and Hybrid Alternatives that need to be considered along with the impacts of the Circ A/B Alternatives in conducting the balancing test. Section 1.3 evaluates the feasibility of the Circ A/B Alternatives from an engineering perspective. Section 1.4 determines whether or not one or more of the Circ A/B Alternatives is prudent based on six factors from the Section 4(f) regulations. Section 1.5 draws conclusions from this analysis and explains whether or not the impacts and problems associated with Circ A/B Alternatives substantially outweigh the importance of protecting VT 2A corridor Section 4(f) resources.

1.1 What are the Section 4(f) Resource Impacts of VT 2A and Hybrid Alternatives?

1.1.1 Historic Resources

Blair House

The Blair House is a circa 1845 vernacular 2-story 5-bay wide wood frame farmhouse converted for use as offices. Central entry with side lights, double ridge chimneys, and 12/12 windows are among the remaining architectural details of this building, which is the visual anchor of Taft Corners.

Under Alternatives 3, 19, 22, and 23 the intersection of VT 2A and US 2 would be reconstructed as a roundabout placing the new edge of pavement within 12 feet of the house. A ten foot wide paved multi-use path would also be constructed along the east and north elevations. A partial acquisition of the property totaling 7,000 square feet (Alternatives 3 and 19) or 8,780 square feet (Alternatives 22 and 23) would be required. The location of the multi-use path would diminish the integrity of setting, feeling and association of the house and property. The VTrans Historic Preservation Officer has made a preliminary determination of “adverse effect” on this resource under Section 106 of the National Historic Preservation Act for these alternatives.



Blair House (Williston)

Starr Apartments

Starr Apartments is a circa 1910 vernacular American Foursquare style house with a hipped roof, now broken up into apartments. Clad in synthetic siding, the 2 ½-story house has an attached shed/garage on the north elevation, added ca. 1960. Located at the northeast corner of the intersection of VT 2A and Mountain View Road, the house is set off from the street by a line of mature maple trees. A Queen Anne style porch extends along the façade (west elevation) and wraps around to the north elevation.

Under Alternatives 2, 3, 18, 19, 22, and 23 the widening of VT 2A and Mountain View Road would require a partial acquisition of up to 1,800 square feet from the Starr Apartments property. The addition of a roundabout to the widened roadway (Alternatives 3, 19, 22, and 23) would require a partial acquisition of an additional 800 square feet from this property. The partial acquisitions would result in the loss of the on-site mature trees that that would diminish the integrity of setting, feeling and association of the house and property. The VTrans Historic Preservation Officer has made a preliminary determination of “adverse effect” on this resource under Section 106 of the National Historic Preservation Act for these alternatives.



Starr Apartments (Williston)

Park Street Historic District

The Park Street Historic District is an enclave of nineteenth century houses indicative of the Greek Revival and Queen Anne styles. The five residences fronting Park Street, are a ca. 1880 2 ½-story Queen Anne style house with outbuildings, a ca. 1890 2 ½-story tri-gable ell plan vernacular Queen Anne style house, a ca. 1870 vernacular Greek Revival style house, a ca. 1890 2-story vernacular Queen Anne style house, and a 1 ½-story ca. 1885 cottage.

Under Alternatives 3 and 19 the reconstruction of the VT 2A intersection with South Street/River Street to a roundabout would require the removal of one of the structures, 76 Park Street that contributes to the District's National Register eligibility. The VTrans Historic Preservation Officer has made a preliminary determination of "adverse effect" on this resource under Section 106 of the National Historic Preservation Act for these alternatives.



76 Park Street (Essex)

Tarbox House

The Tarbox House is a circa 1820 2-story brick Federal style side gable house. The house was built by Ezra Slater, Sr., and for some time the basement was used as a store and creamery by the Coon Family. The property was sold to Rozwell B. Tarbox in 1885, and remained in the family into the 1930s. The slightly off-center entry is surrounded by fluted pilasters and topped with a broken pediment. 2/2 windows with brick splayed lintels are found throughout. A 1-story shed roof addition is on the rear (south) elevation.

Under Alternatives 3 and 19 the reconstruction of the VT 2A intersection with South Street/River Street to a roundabout would require the removal of the structure. The VTrans Historic Preservation Officer has made a preliminary determination of "adverse effect" on this resource under Section 106 of the National Historic Preservation Act for these alternatives.



Tarbox House (Essex)

67 Park Street

67 Park street is a circa 1890 2 ½-story vernacular Queen Anne style house with a gable-front and wing form. The façade (east elevation) has 2/2 windows with plain surrounds and cap molded lintels, a 3-side bay window, and a porch with turned posts.

Under Alternatives 2, 3, 18, and 19 VT 2A would be widened and the existing sidewalk relocated closer to this property. This would result in a partial acquisition of 1,920 square feet (Alternatives 2 and 18) or 1,400 square feet (Alternatives 3 and 19) from this property. Although the structure would not be physically damaged or destroyed, the relocation of the sidewalk to abut the structure would diminish its integrity of setting, feeling and association. The VTrans Historic Preservation Officer has made a preliminary determination of “adverse effect” on this resource under Section 106 of the National Historic Preservation Act for these alternatives.



67 Park Street (Essex)

Anna Early House

A ca. 1840 2-story vernacular 3-bay wide house with double ridge chimneys. A partial Queen Anne style porch covers the central entry, and 2/2 windows with plain surrounds and lip molded lintels are found throughout. A 1 ½-story addition with 6/6 sash extends from the west elevation.

Under Alternatives 2, 3, 18, and 19 VT 2A would be widened closer to the structure resulting in a partial acquisition of the property of 700 square feet. The existing front yard would be directly impacted resulting in a loss of area devoted to the front yard. Although these alternatives would not cause physical destruction or damage to the house nor change the character of its use or physical features from which it derives its significance, the widening of VT 2A would directly impact and eliminate a large portion of the front yard, thus diminishing the setting, feeling and association. The VTrans Historic Preservation Officer has made a preliminary determination of “adverse effect” on this resource under Section 106 of the National Historic Preservation Act for these alternatives.



Anna Early House (Essex)

Lincoln Inn

The Lincoln Inn, one of the remaining historical focal points at the Five Corners intersection, was built between 1857 and 1869. The property has operated as an inn for over one hundred years. Sanborn maps from the late 19th and first half of the 20th century depict the structural evolution of the building. In the early 20th century, a porch extended along the length of the north elevation of the ell and wrapped around to the east elevation. Today, a one-story enclosed porch extends along the north and west elevations of the building; the main entrance is located on the west elevation. The porch is topped with a simple straight balustrade.

The Lincoln Inn meets National Register Criteria A and C as a locally significant example of an inn and tavern at a historic crossroads in Essex Junction, and as one of two remaining historic buildings (the other a former inn, is now the village offices located diagonally across the Five Corners intersection from the inn). Together these two buildings anchor the intersection. Architecturally, the building is a good example of Victorian architecture, and despite additions to the building, it retains a relatively high degree of integrity with respect to design, materials and workmanship. The carriage house, although altered, contributes to the property's historical significance, as it still conveys its historical relationship as an outbuilding.

Under Alternatives 2 and 18 VT 2A would be widened to within two feet of the building. A partial acquisition of 3,080 square feet would be required. To accommodate the relocation of the sidewalk and widened roadway, the existing stairways and entrances would require modifications. The VTrans Historic Preservation Officer has made a preliminary determination of "adverse effect" on this resource under Section 106 of the National Historic Preservation Act for these alternatives.

Under Alternatives 3, 19, 22, and 23 the VT 2A/VT 15/VT 117 intersection would be reconfigured as a roundabout. A partial acquisition of 800 square feet of the property would be required. To accommodate the construction of the roundabout, the northwest corner of the existing porch would be removed and the building façade and front yard would be altered. The VTrans Historic Preservation Officer has made a preliminary determination of "adverse effect" on this resource under Section 106 of the National Historic Preservation Act for these alternatives.



Lincoln Inn (Essex Jct.)

1.1.2 Park and Recreation Resources

Veterans Memorial Park

Veterans Memorial Park is a landscaped triangular area in the center of Essex Junction. The park has existed since the 1950s as the location of memorial to Essex Junction residents who gave their lives in the U.S. Armed Services since the time of the Civil War. It was given its current name by the Village Trustees in 1995. Veterans Memorial Park is owned by the Village of Essex Junction and was remodeled in 2005. In addition to a federal grant from the Department of Housing and Urban Development, funding was provided in part by local organizations.

Veterans Memorial Park comprises approximately 6,650 square feet; this area reflects a curb relocation at the north side of the park which increased its area when it was recently remodeled. The park has a formal ceremonial design in which one enters from the point closest to the center of the Five Corners intersection; crosswalks on Main Street and Lincoln Street connect to this entry point. From the point of entry, a path leads visitors through the park past several monuments that list both the names of those who gave their lives and their battle engagements, as well as a fountain and flags. The path also leads visitors to the central feature of the park, a plaza with a fountain and a row of flags. The path is bordered by plantings and a large fir tree and two recently planted maple trees. Benches are provided on the perimeter of the circular plaza that surrounds the fountain, and the plaza is paved in light-colored concrete pavers with granite borders and a planter that wraps around the plaza. Mowed turf borders the edges of the park.

The intended function of the park is for passive use and as a ceremonial/memorial site. Ceremonies are conducted at the park on Memorial Day. According to architect Steven Schenker, who designed the park, the fountain is also intended as an informal gathering place.

Alternatives 3, 19, 22 and 23 would replace the signalized intersection with a new roundabout design and require the reconfiguration of the external areas of the park. Specifically, the alternatives would encroach into the southerly portion of the park area (taking 922 square feet), requiring the relocation of the main entry to the park. Based on discussions with Village officials, the activities, features and attributes of the park would be adversely affected by relocating the main entry point even if the monuments themselves were avoided as the orientation of the entry point to the war monuments is important for veterans' ceremonies. The base alternative would also encroach on the Vietnam War Monument. The use could potentially be minimized by modifying the base design to reduce the number of entry/exit lanes. A design was examined that would reduce the roundabout exit to VT 2A northbound from 2 lanes to 1. This design modification would minimize but not avoid use of the southerly portion of the park. The design modification would not encroach on the Viet Nam War monument but would require the relocation of the main entry point to the park. In addition to not avoiding the park, the design modification would also compromise traffic flow by resulting in unacceptable level-of-service (LOS) F conditions.

The northerly end of the park would also need to be reconfigured, thus affecting 145 square feet of the park. Both the base design and the minimization design require that the park be closed for the duration of construction. Correspondence with Essex Junction officials indicates that they would not consider the impacts of any of the VT 2A or Hybrid Alternatives de minimis.



Veterans Memorial Park (Essex Jct.)

1.2 What are the Non-Section 4(f) Impacts and Problems with VT 2A and Hybrid Alternatives?

1.2.1 Community Character

The VT 2A and Hybrid Alternatives would require the full acquisition and displacement of one to six residential units and four to five small businesses, depending on the alternative. These alternatives would also require 77 to 157 partial property acquisitions along VT 2A. In addition to the use of Section 4(f) resources and Section 106 Adverse Effect determinations discussed in Section 1.1, the VT 2A and Hybrid Alternatives would also result in Section 4(f) use of property from 9 to 23 other historic structures along VT 2A (e.g. reduction in setbacks from roadway). While individually the impacts to these historic properties are considered de minimis, when considered cumulatively, these alternatives would diminish the historic character of the VT 2A corridor. This effect is most severe in Essex Junction under Alternatives 2 and 3 (four-lane roadway through Park Street residential area in village).

Community character in residential areas north of Blair Park in Williston would be affected by the wider profile of the VT 2A roadway (four or three lanes). The wider roadway would change the visual appearance of the corridor, and require many of the existing street trees to be removed. The widened roadway would reduce the size of the front lawns of the houses that front the roadway. Alternatives 22 and 23 involve a three-lane roadway profile in the residential area of Williston north of Blair Park. Alternatives 22 and 23 would not involve any roadway widening in the Village of Essex Junction, however they would include property impacts associated with a roundabout at Five Corners. All of the VT 2A and Hybrid Alternatives would increase traffic volumes on VT 2A and other roadways in Essex Junction, such as VT 15 and VT 117. Public comments from local residents indicate the existence of strong community opposition to improvements to VT 2A that would increase roadway width and/or increase through traffic volumes.

1.2.2 Consistency with Local and Regional Plans

The VT 2A and Hybrid Alternatives would be inconsistent with the comprehensive plans of Williston, Essex and Essex Junction since the plans of each of these municipalities include the completion of the CCCH (including Segments A/B). The VT 2A and Hybrid Alternatives would be inconsistent with local planning that has anticipated construction of the CCCH, including the Chittenden Solid Waste District Regional Landfill which was accepted by Williston “with the understanding that the truck traffic serving this facility would be able to use the highway once constructed” (Williston Selectboard, 2005). The VT 2A and Hybrid Alternatives would be inconsistent with the preferences expressed in the resolution passed by Essex, Essex Junction during scoping.

In comments on the DEIS, the Chittenden County Regional Planning Commission concludes that “only Alternatives 16a, 16c, and 17 are in conformance with all of the 2006 Chittenden County Regional Plan policies that can be determined at this time.” The VT 2A and Hybrid Alternatives are inconsistent with the 2006 Chittenden County Regional Plan because they are inconsistent with the adopted plans of the municipalities in the project area. CCRPC’s comments urge VTrans and FHWA to heavily weigh conformance with approved local and regional plans in selecting a preferred alternative.

Essex Junction Redevelopment Project

The Essex Junction Redevelopment Project consists of improvements along the roadway approaches to the Five Corners intersection (VT 2A, VT 15, VT 117). The purpose of the Essex Junction Redevelopment Project is “to revitalize Downtown Essex Junction in an attempt to help the community attract public and private sector investment, increase occupancy, draw customers, provide visual integration, improve aesthetics, create a pedestrian friendly environment and restore Downtown Essex Junction as the principal focal point of the community (Essex Junction STP 5300(9)-“Five Corners” Redevelopment Programmatic Categorical Exclusion Document, 2006). The Essex Junction Redevelopment Project includes replacement of curbing and sidewalks, landscaping, street furniture, installation of “gas lamp” style light poles and new mast mounted traffic signals. The project also includes the creation of diagonal on-street parking on VT 2A between the railroad tracks.

The VT 2A and Hybrid Alternatives would be inconsistent with the Essex Junction Redevelopment Project, which is currently under construction. Under Alternatives 2, 3, 18 and 19, there would be a net loss of fifty-eight on-street parking spaces on VT 2A between South Street and Five Corners to accommodate roadway widening. Parking availability in Essex Junction would not be changed by Alternatives 22 and 23, which do not involve roadway widening in Essex Junction. However, Alternatives 22 and 23 do include a roundabout at Five Corners that would be inconsistent with the Essex Junction Redevelopment plan for this intersection (e.g. plans for landscaping, sidewalk and curb replacement, pedestrian crossing strips, and lighting)

1.2.3 Noise

The results of the noise analyses show that in the future without any of the project alternatives, 48 noise receptors along VT 2A would exceed VTrans or FHWA noise impact criteria. The VT 2A and Hybrid Alternatives would substantially increase traffic noise on VT 2A through higher traffic volumes and speeds, 59 to 84 receptors would exceed the impact criteria.

1.2.4 Land Acquisition/Right-of-Way Availability

The right-of-way in Essex Junction needed to construct the VT 2A and Hybrid Alternatives is not reasonably obtainable under state law. VT 2A in Essex Junction is a Class 1 Town Highway. Town highways are under the general supervision and control of the selectboards of the towns where the roads are located (19 V.S.A. § 303). In the case of an incorporated village such as Essex Junction, the selectboard's duties and responsibilities with respect to highways are exercised by the village trustees. The authority to condemn land and rights in land for improvements to town highways, including class 1 town highways, resides exclusively with the selectboard or (in the case of an incorporated village) village trustees. See generally 19 V.S.A. Chapter 7 (Laying out highways). The Essex Junction Village Trustees have stated that they are opposed to all of the VT 2A Alternatives, would not be willing to condemn property for any of the VT 2A Alternatives, and would not relinquish control of VT 2A in Essex Junction to the state for the purpose of condemning property to construct a VT 2A Alternative (See the May 13th 2008 resolution).

The only way a VT 2A or Hybrid Alternative could potentially be constructed in the absence of cooperation from Essex Junction would be for the portion of VT 2A in Essex Junction to be added to the state highway system. Highways can only be added to or deleted from the state highway system with the approval of the legislature (19 V.S.A. 15, Changes in the state highway system). Given the strong tradition of local control in Vermont, it is extremely unlikely that the legislature would even consider such a change without the concurrence and support of the local selectboard or village trustees. The need for an act of the legislature to construct a VT 2A or Hybrid Alternative makes these alternatives unavailable to VTrans.

Furthermore, even if the legislature did add VT 2A to the state highway system, the VT 2A or Hybrid Alternatives could still be stopped by a local veto (19 V.S.A. § 1511, Town approval of projects on the state highway system). A local veto in Essex Junction would be expected, given the responses to the 2007 Community Survey question: "The Village Trustees should continue to support completion of the Circumferential Highway and actively oppose any other transportation initiatives for the 2A corridor, including a roundabout at Five Corners" – Strongly Agree: 66 percent, Agree: 22 percent, Disagree: 8 percent, Strongly Disagree: 4 percent.

The VT 2A and Hybrid Alternatives are not available or capable of being done because Essex Junction would oppose a VT 2A or Hybrid Alternative in the Act 250 permitting process and no Act 250 permit would be issued. In connection with an Act 250 permit application, the impact on municipal services and conformance with the Town (Village) plan are among the criteria to be considered by the district commission. Under criterion 10, the applicant must demonstrate that a project conforms to the local or regional plan. Chapter 6 of the DEIS demonstrates that the VT 2A and Hybrid Alternatives are inconsistent with local and regional plans. The Essex Junction Village Trustees have confirmed that the VT 2A and Hybrid Alternatives are inconsistent with the Village plan and would be opposed in the Act 250 process. Therefore, an Act 250 permit could not be issued for these alternatives and they would not be capable of being done.

1.3 Are the Circ A/B Alternatives Feasible?

According to the FHWA's Section 4(f) regulations, "an alternative is not feasible if it cannot be built as a matter of sound engineering judgment" (23 CFR 774.17, definition of

feasible and prudent avoidance alternative, paragraph (2)). All of the Circ A/B Alternatives are feasible based on this criterion, as they could be built from an engineering perspective. The Circ A/B Alternatives preliminary designs were prepared in accordance with VTrans and AASHTO design standards; see the Preliminary Engineering Technical Report for more information on the design process.

1.4 Are the Circ A/B Alternatives Prudent?

FHWA's regulations (23 CFR 774.17, definition of feasible and prudent avoidance alternative, paragraph (3)) establish six measures that determine whether or not an avoidance alternative is prudent. An alternative is not prudent if:

- It compromises the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need;
- It results in unacceptable safety or operational problems;
- After reasonable mitigation, it still causes: Severe social, economic, or environmental impacts; Severe disruption of established communities; Severe disproportionate impacts to minority or low income populations; or Severe impacts to environmental resources protected under other Federal statutes;
- It results in additional construction, maintenance or operational costs of an extraordinary magnitude;
- It causes other unique problems or unusual factors; or
- It involves multiple factors in paragraphs 3(i) through 3(v) of this definition, that while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

1.4.1 Do the Circ A/B Alternatives compromise the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need?

The purpose of the Circ-Williston Transportation Project is to improve access to, from, and within the project area and remedy existing and projected deficiencies including congestion, safety, and mobility issues (including the movement of both people and goods). FHWA has determined that one or more of the Circ A/B Alternatives remedy existing and projected deficiencies and improve access to, from, and within the project area, and perform substantially better than the VT 2A and Hybrid Alternatives. Therefore, the Circ A/B Alternatives do not compromise the project to a degree that is unreasonable to proceed with the project in light of its stated purpose and need.

1.4.2 Do the Circ A/B Alternatives result in unacceptable safety or operational problems?

Except for Alternative 17, none of the Circ A/B Alternatives have unacceptable safety or operational problems.

Alternative 17 reduces crashes at high crash locations along VT 2A, but results in a net increase of one crash over the No Build Alternative for the project area as a whole because it creates two new signalized intersections (US 2 and Mountain View Road). Therefore, Alternative 17 does not meet the purpose and need for remedying safety problems. This situation could be corrected by installing a diamond interchange instead of signalized intersection at Mountain View Road (as in Alternative 16c).

1.4.3 Do the Circ A/B Alternatives cause severe impacts?

It is important to note that the determination regarding severe impacts takes into consideration “reasonable mitigation.” Therefore, this section summarizes the impacts of the Circ A/B Alternatives and the proposed mitigation, and determines whether or not the net effect on particular resource is severe.

Social, Economic, or Environmental Impacts

Social Impacts

As discussed below under the section on the disruption of established communities, the Circ A/B Alternatives do not create severe social impacts.

Economic Impacts

The Circ A/B Alternatives do not require the relocation of any existing businesses. The Circ A/B Alternatives result in positive economic impacts during the construction period. Therefore the Circ A/B Alternatives do not create severe economic impacts.

Environmental Impacts

Taking into consideration all proposed mitigation measures, the Circ A/B Alternatives do not cause severe environmental impacts on resources that are not directly protected by Federal statutes. Impacts on resources protected by Federal statutes are discussed in a separate section, below.

Disruption of Established Communities

Alternative 16b would require one residential displacement, which would not cause a severe disruption of an established community. Alternatives 16a, 16c, and 17 would not involve any full acquisitions that would require the relocation of residences or businesses. The limited number and extent of partial property acquisitions under the Circ A/B Alternatives would not cause a severe disruption of established communities. In addition, the Circ A/B Alternatives would not divide any existing neighborhoods. The right-of-way for the Circ A/B corridor was secured before the construction of residential subdivisions adjacent to the corridor. Accommodations would be made for pedestrian and bicycle connectivity between neighborhoods on either side of the corridor, including an overpass to carry the existing Williston Alternative Transportation Path over the roadway.

Disproportionate Impacts to Minority or Low Income Populations

The environmental justice analysis shows that the Circ A/B Alternatives have no disproportionate impacts on low income or minority populations.

Impacts to Environmental Resources Protected Under Other Federal Statutes

Waters of the United States

The purpose of the Clean Water Act is to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters (33 USC 1251). Section 404 of the Clean Water Act requires the Army Corps of Engineers (ACOE) to approve the discharge of dredged or fill materials into waters of the United States.

Table 1 shows the wetland impacts of the Circ A/B Alternatives by cover type, over 50 percent of the impacts are to emergent wetlands, many of which have been farmed in the recent past, but were abandoned for agricultural purposes following the purchase of the right-of-way, allowing wetland vegetation to establish on the hydric soils. Table 1 also demonstrates the substantial reductions in forested wetland impact achieved with Alternatives 16c and 17 in comparison to the other Circ A/B Alternatives. Total forested wetland impacts under Alternative 17 are 6.66 acres, nearly 7 acres less the forested wetland impacts of Alternative 16a. These impact reductions are achieved through the elimination of an interchange at Redmond Road and a shift in the alignment to minimize fragmentation of the forested wetland complex north of Mountain View Road (wetland G).

Table 2 shows Circ A/B corridor wetland impacts by the principal functions and values of the affected wetlands. Well over 50 percent of the wetland impacts are to relatively low value wetlands that have sediment/toxicant retention and nutrient removal as their only principal function and value. In addition to compensatory mitigation to replace impacted acreage, the water quality functions performed by these wetlands will also be replaced by the project’s stormwater treatment system, thereby ensuring the protection and improvement of water quality. Alternatives 16c and 17 have substantially fewer impacts than the other Circ A/B Alternatives on wetlands with wildlife habitat and groundwater discharge as principal functions and values, 5.31 acres under Alternative 17 compared to 12.18 acres under Alternative 16a. Two areas in the corridor have relatively high value wetlands (five or more principal functions and values)—wetland E2 adjacent to Allen Brook and wetland J adjacent to the Winooski River. Impacts to wetland J are negligible, 0.32 acres under all of the Circ A/B Alternatives. Wildlife movement through the Winooski River riparian corridor will not be disrupted because it will be spanned with a bridge. Wetland impacts to wetland E2 are 1.52 to 1.72 acres under Alternatives 16a, 16c, and 17. Alternative 16b results in greater wetland impacts near Allen Brook (4.10 acres) as a result of the ramps needed to construct an interchange between the Circ A/B roadway and US 2.

**Table 1
Circ A/B Alternatives Wetland Impacts by Cover Type**

Type	Alternative 16a		Alternative 16b		Alternative 16c		Alternative 17	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Emergent	16.75	52.3%	18.75	51.2%	16.76	61.5%	15.97	64.3%
Emergent/Scrub-Shrub	1.56	4.9%	4.14	11.3%	1.56	5.7%	2.10	8.5%
Scrub-Shrub	0.16	0.5%	0.16	0.4%	0.16	0.6%	0.09	0.4%
Forested/Scrub-Shrub	12.32	38.5%	12.32	33.7%	7.00	25.7%	5.63	22.7%
Forested	1.24	3.9%	1.24	3.4%	1.78	6.5%	1.03	4.1%
Total	32.03	100.0%	36.61	100.0%	27.26	100.0%	24.82	100.0%

Table 2
Circ A/B Alternatives Wetland Impacts by Principal Functions and Values

Principal Function and Values	Alternative 16a		Alternative 16b		Alternative 16c		Alternative 17	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
sediment/toxicant retention	1.28	4.0%	1.28	3.5%	1.78	6.5%	1.16	4.7%
sediment/toxicant retention, nutrient removal	16.42	51.3%	18.42	50.3%	16.47	60.4%	15.66	63.1%
sediment/toxicant retention, sediment-shoreline stabilization	0.04	0.1%	0.04	0.1%	0.04	0.1%	0.38	1.5%
sediment/toxicant retention, nutrient removal, sediment-shoreline stabilization	0.27	0.8%	0.27	0.7%	0.27	1.0%	0.27	1.1%
wildlife habitat, groundwater discharge	12.18	38.0%	12.18	33.3%	6.86	25.2%	5.31	21.4%
floodflow alteration, sediment/toxicant retention, nutrient removal, sediment-shoreline stabilization, wildlife habitat	0.32	1.0%	0.32	0.9%	0.32	1.2%	0.32	1.3%
floodflow alteration, sediment/toxicant retention, nutrient removal, sediment-shoreline stabilization, wildlife habitat, educational-scientific value	1.52	4.7%	4.10	11.2%	1.52	5.6%	1.72	6.9%
Total	32.03	100.0%	36.61	100.0%	27.26	100.0%	24.82	100.0%

The wetland impacts of the Circ A/B Alternatives can be mitigated through compensatory mitigation, conducted in accordance with mitigation guidelines developed by the U.S. Army Corps of Engineers. The final wetland mitigation package may include wetland creation, restoration and/or preservation components to fully compensate for the impacts of the selected alternative on a functions and values basis. All of the wetland impacts are capable of being mitigated, including the creation of forested wetland habitat suitable for wood frogs. An example of a recently permitted project involving and impacts and mitigation of forested wetland impacts is the Federal Correctional Institution proposed for Berlin, New Hampshire by the Federal Bureau of Prisons (permit NAE20063342). This project involved 12 acres of forested wetland impacts, creation of vernal pools habitat, and restoration and preservation of forested wetlands. Considering the extent of the impacts (largely lower value, emergent wetlands), the location of the project (surrounded by existing and planned development), and the ability to mitigate the impacts, the wetland impacts of the Circ A/B Alternatives are not severe.

The conclusion that the impacts of the Circ A/B Alternatives are not severe is further supported by fact that the CCCH project wetland impacts were previously permitted and mitigated. The 54.6 acre Lemire wetland mitigation site, located adjacent to VT 128 northwest of Essex Center, was created to mitigate the impacts associated with the construction of CCCH segments A-B (15.7 acres) and G-J (24.5 acres). The impacts previously mitigated in the Circ A/B corridor included the impacts to the higher value wetlands discussed above. The site completed its five-year monitoring period and was accepted by the Corps.

Wildlife Habitat

The Circ A/B Alternatives do not have substantial wildlife habitat fragmentation effects. South of Mountain View Road the corridor is surrounded by residential development, a school, and a golf course. North of Mountain View Road the Circ A/B corridor passes on the edge of a large habitat area. Much of the habitat between the Circ A/B corridor and Redmond Road that would be isolated by a Circ A/B Alternative will be impacted in the future by the 66-acre Chittenden Solid Waste District regional landfill. The most important wildlife travel corridor in the project area is along the Winooski River. The Winooski River riparian corridor would be completely spanned by a bridge under the Circ A/B Alternatives, the movement of wildlife through this corridor would not be impacted.

EPA comments have indicated concern with the impact of the Circ A/B Alternatives on wetland G, a scrub-shrub/forested wetland north of Mountain View Road. Breeding habitat for a population of wood frogs (a common species in Vermont) occurs in a ditch along an abandoned roadbed north of Mountain View Road and west of the Circ A/B right-of-way. Alternatives 16a, 16b, and 16c would directly impact approximately half of this 600-foot long ditch. Alternative 17 would not directly impact the wood frog habitat. All of the Circ A/B Alternatives would isolate the breeding habitat from the surrounding forestland, likely resulting in the loss of the breeding population occupying this habitat. Mitigation for wood frog breeding habitat impacts could be conducted at the off-site wetland mitigation site or in the forested area to the west of the right-of-way.

Threatened and Endangered Species

The Endangered Species Act of 1973 charges the U.S. Fish and Wildlife Service with responsibility for the listing and management of threatened and endangered species. The extensive agency coordination and field reconnaissance conducted for the proposed project did not locate any federal or state listed threatened or endangered species in the vicinity of the Circ A/B corridor, therefore no impacts would occur.

Air Quality

As a result of the Clean Air Act, EPA has established health-based National Ambient Air Quality Standards (NAAQS) for six air pollutants: particulate matter, ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, and lead. The air quality analyses for the Circ A/B Alternatives show that no exceedances of the NAAQS are anticipated. In addition, pollutants not regulated by the Clean Air Act, such as nitrous oxides, volatile organic compounds, and mobile source air toxic emissions would decrease in the future under the Circ A/B Alternatives. Therefore the Circ A/B Alternatives do not cause severe air quality impacts and no mitigation is necessary.

Noise

The Federal Aid Highway Act of 1970 required FHWA to develop noise standards for mitigating highway traffic noise. Alternatives 16a, 16b, and 16c would result in noise impacts based on VTrans and FHWA noise impact criteria. In the Circ A/B corridor 33 to 34 residential noise receptors would be impacted, with typical noise increases of 10-20 dBA over existing conditions for the residential areas closest to the roadway. A 3 dBA increase is generally considered just perceptible, while a 10 dBA increase is perceived as a doubling of the sound level. While the projected increases seem large, they need to be considered in context to the total sound levels. Existing sound levels near the Circ A/B corridor are low, 39 to 56 dBA. Even with the estimated noise level increases, no receptor is expected to experience noise levels higher than 73 dBA during the AM peak hour. At off-peak times with lower traffic volumes the projected noise level would be lower. In addition, it is also important to note that the noise analysis results are for

outdoor areas and do not reflect the noise attenuation of indoor conditions. Therefore, the noise impacts of Alternatives 16a, 16b, and 16c are not severe.

The VTrans Noise Policy establishes the conditions necessary for the funding of noise barriers. Noise mitigation was analyzed for the impacted receptors along the Circ A/B corridor, but was found not to meet the VTrans reasonable cost criterion (\$20,000 per benefited residence). Therefore, no noise mitigation is proposed under Alternatives 16a, 16b, and 16c. Alternative 17 (Circ A/B boulevard) does not result in any noise impacts in the Circ A/B corridor, and therefore does not require noise mitigation.

1.4.4 Do the Circ A/B Alternatives result in additional construction, maintenance or operational costs of an extraordinary magnitude?

Including differences in estimated design and permitting costs, the Circ A/B Alternatives would cost between \$62.8 and \$89.1 million (in 2007 dollars). The cost of the Circ A/B Alternatives is not unreasonable for a transportation project of this scale. The Circ A/B Alternatives would not require extraordinary maintenance or operational costs.

1.4.5 Do the Circ A/B Alternatives cause other unique problems or unusual factors?

There are no other unique problems or unusual factors associated with the Circ A/B Alternatives.

1.4.6 Do the Circ A/B Alternatives involve multiple factors that cumulatively cause unique problems or impacts of extraordinary magnitude?

Considering the cumulative factors and issues associated with the Circ A/B Alternatives do not cause unique problems or impacts of extraordinary magnitude. The impacts associated with the Circ A/B Alternatives can be mitigated.

1.5 Conclusion

The analysis demonstrates that the Circ A/B Alternatives are feasible and prudent avoidance alternatives. The impacts of these alternatives are not severe, can be mitigated, and do not outweigh the importance of protecting the historic and parkland resources that would be impacted by constructing an alternative in the VT 2A corridor.