

EXECUTIVE SUMMARY

ES-1 Introduction and Background

The Vermont Agency of Transportation (VTrans), in cooperation with the Federal Highway Administration (FHWA), is proposing improvements to the transportation system to, from and within an area known as the Circ-Williston project area from Interstate Route I-89 to the Towns of Williston and Essex and the Village of Essex Junction in Chittenden County, Vermont. The project area is shown in Figure ES-1-1.

Numerous studies and plans for improving transportation in the project area have been undertaken at various levels of government since the late 1950s. Chittenden County has experienced a period of rapid population and employment growth, with corresponding traffic growth, over three decades and is expected to continue to grow for several decades into the future. Other than local improvements and the construction of VT 289 in Essex (described below), the transportation network has remained relatively unchanged in the project area during this time. As a result, the Circ-Williston project area exhibits many transportation system deficiencies including: traffic congestion; safety and turning movement issues; inefficient movement of goods and people, and truck traffic on local roadways.

Previous transportation studies prepared for the Chittenden County region resulted in plans for a limited access circumferential highway from VT 127 in Colchester through Essex, and around the Essex Junction and the Five Corners intersection (VT 2A-VT 15-VT 117) to I-89 in Williston. Local municipalities began making provisions for a circumferential highway in their comprehensive plans beginning in 1967. In 1975, the Chittenden County Regional Planning Commission (CCRPC) adopted a Regional Plan with the circumferential highway as a major objective of the Plan's transportation component. The project was called the Chittenden County Circumferential Highway Project (CCCH), and consisted of a 16-mile limited access facility located in the towns of Williston, Essex and Colchester.

Funding for the CCCH was secured through a Demonstration Grant from the 1982 Surface Transportation Act. The Final Environmental Impact Statement (FEIS) and the Record of Decision (ROD) were completed in 1986. Subsequently, federal funds were used to construct four of the 16 miles in Essex, between VT 117 east of Essex Junction and VT 2A and Susie Wilson Road north of Essex Junction. This section of two-way roadway opened to traffic as VT 289 in 1993.

While VT 289 has served to reduce traffic volumes and congestion on several roadway segments (specifically, VT 2A and VT 15 north of Five Corners, and VT 117 south of Five Corners in Essex and Essex Junction), traffic volumes on other north-south roadway segments, in particular on VT 2A between I-89 Exit 12 in Williston, the Five Corners intersection in Essex Junction, and on North Williston Road in Williston, continued to grow at relatively high rates, with corresponding growth in traffic congestion and accidents. The proposed project is intended to address these conditions through the year 2030.

ES-2 Project 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 movement of both people and goods).

Project area transportation deficiencies (particularly on portions of north-south oriented roadways) that the proposed project would address include:

- traffic congestion problems from excessive delays at intersections and/or traffic volumes exceeding roadway segment capacities;
- safety problems from excessively high numbers of vehicular crashes;
- mobility problems from the inefficient movement of goods and people; and,
- problems associated with truck traffic using local roads to avoid congestion on arterial roadways.

The proposed project will assist in meeting existing transportation needs and projected future population and employment growth expected in the project area and elsewhere in Chittenden County.

ES-3 Project Description and Alternatives

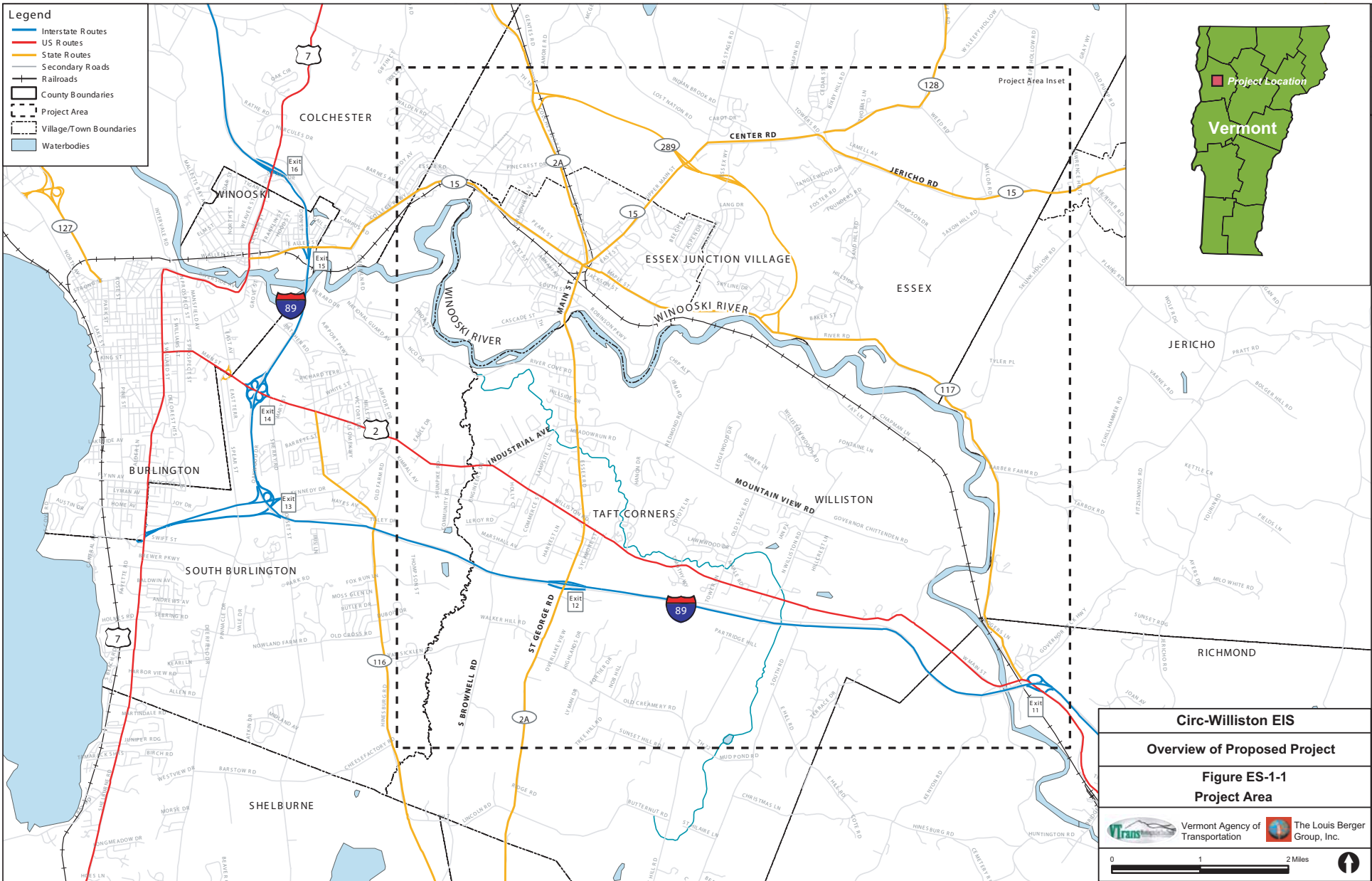
The proposed project consists of the No Build Alternative and ten Build Alternatives. The Build Alternatives are organized into three groups: 1) the VT 2A Alternatives (2, 3, 22); 2) the Circ A/B Alternatives (16a, 16b, 16c, 17); and 3) the Hybrid Alternatives (18, 19, 23). The alternative designation numbers are not sequential because they retain the number they were assigned during the initial screening of potential alternatives for the proposed project. Table ES-1 summarizes the type, location and key elements of the VT 2A, Circ A/B and Hybrid Build Alternatives. Chapter 4.0 provides further detailed information regarding the Build Alternatives.

ES-3.1 No Build Alternative

The future condition without the proposed project is called the No Build Alternative. Analysis of the No Build Alternative is required by the National Environmental Policy Act (NEPA) and is used as baseline for the evaluation of the environmental effects of the Build Alternatives of the proposed project. The No Build Alternative includes expected improvements in the VT 2A and Circ A/B corridors, as well as other transportation and non-transportation projects in Chittenden County that would be completed by the analysis year of 2030.

In general, the No Build Alternative includes all the improvements committed to in the Chittenden County Metropolitan Planning Organization's (CCMPO) *Transportation Improvement Plan* (TIP) and the improvements with anticipated funding that are included in the *2025 Metropolitan Transportation Plan* (MTP).

Future residential and commercial development for the No Build Alternative was projected using the Land Use Allocation Module (LUAM) of the Chittenden County Transportation Model. These estimates of future development included information on known projects gathered from local government officials, development review board minutes, town and county reports on planned and permitted development and press reports. This information was used to identify future growth patterns under the No Build Alternative in order to provide a baseline for comparing the Build Alternatives. LUAM allocates household and residential growth based on accessibility and development constraints.



Source: Draft 2025 Chittenden County Metropolitan Transportation Plan, CCMPO.

**Table ES-1
Build Alternatives**

Name	Type of Alternatives	Location of Alternatives	Key Elements of Alternatives
VT 2A Alternatives (2, 3, 22)	Improvements to existing roadway	VT 2A, from I-89 Exit 12 to the Five Corners intersection in Essex Junction.	<ul style="list-style-type: none"> ▪ Widening to increase the number of travel lanes ▪ Roundabout intersections (Alternatives 3 and 22) ▪ Signalized intersection improvements (Alternative 2)
Circ A/B Alternatives (16a, 16b, 16c, 17)	Construction of new roadway	The existing Circ A/B right-of-way, between I-89 in Williston and the existing terminus of VT 289 at VT 117 in Essex.	<ul style="list-style-type: none"> ▪ Construction of a four-lane limited access highway with various interchange options and a grass median (Alternatives 16a, 16b, 16c) ▪ Construction of a four-lane boulevard style roadway with at-grade intersections and a landscaped median (Alternative 17)
Hybrid Alternatives (18, 19, 23)	Combinations of improvements to the existing roadway with construction of new roadway	VT 2A, from I-89 Exit 12 to the Five Corners intersection in Essex Junction and the existing Circ segment A right-of-way between I-89 and Mountain View Road.	<ul style="list-style-type: none"> ▪ Same improvements being considered in the VT 2A alternatives with the addition of "Circ Street" between I-89 and Mountain View Road.

ES-3.2 Build Alternatives

Figures ES-3-1 through ES-3-10 illustrate the roadway improvements and typical cross sections for each of the Build Alternatives.

VT 2A Alternatives (2, 3, 22)

The defining characteristic of the VT 2A Alternatives is that they involve improvements to VT 2A between I-89 Exit 12 in Williston and Five Corners in Essex Junction. They all involve varying degrees of roadway widening, as well as intersection improvements. From I-89 to US 2 (a distance of approximately .75 mile), VT 2A is four lanes, with additional turning lanes at intersections. From US 2 to Five Corners (a distance of approximately 3.25 miles), VT 2A is two lanes, with additional turning lanes at intersections. Most of the intersections on VT 2A are signalized at the key roadway crossings.

At the key crossings, Alternative 2 would widen VT 2A to four travel lanes from I-89 to Five Corners, with additional turning lanes and the installation of new traffic signal systems at intersections. Alternative 3 would also widen VT 2A to four travel lanes, but instead of turning lanes and new traffic signals, roundabouts would be provided at key intersections. Alternative 22 would involve tapered widening of VT 2A, with four travel lanes at the southern part of the roadway (roughly south of Taft Corners-US 2), two travel lanes with a center two-way left turn lane in middle segment (between Taft Corners and James Brown Drive in Williston) and two travel lanes (unchanged from the existing layout) in the northernmost part of the corridor from James Brown Drive to Five Corners. Alternative 22 would also involve the installation of

roundabouts at key intersections, but at fewer locations than Alternative 3. Alternative 22 would differ from Alternative 3 as a result of the tapered travel lanes, four lanes south of US 2 and two lanes north of US 2.

Circ A/B Alternatives (16a, 16b, 16c, 17)

The defining characteristic of the Circ A/B alternatives is that they involve the construction of a new roadway connecting I-89 in Williston to VT 289 in Essex, in the existing Circ A/B right-of-way. The Circ A/B alternatives would require the construction of a new bridge over the Winooski River and interchange ramps to connect the new roadway to the existing interchange of VT 289 and VT 117.

The Circ A/B Alternatives would also involve intersection improvements on VT 2A, but less extensive than the improvements proposed for the VT 2A Alternatives. These improvements are called “spot improvements”. These minor improvements include adjusting signal timing and adding turning lanes at four intersections on VT 2A.

Alternative 16 is a four-lane limited access highway with a grass median, while Alternative 17 is a four-lane boulevard-type street with a landscaped median and at grade intersections.

There are three combinations of interchange options being evaluated for Alternative 16. These design options are referred to as Alternatives 16a, 16b and 16c, respectively. These options were evaluated to investigate the effects of including an interchange at US 2, and a different interchange design in the area of Mountain View Road and Redmond Road designed to reduce wetland impacts.

Alternative 16a would have a trumpet interchange with I-89 and with Redmond Road, but would have no connection to US 2. A trumpet interchange provides all movements, with separate ramps. Alternative 16b would have the same trumpet interchanges as Alternative 16a at I-89 and Redmond Road. However, Alternative 16b would also have a partial cloverleaf interchange at US 2. A cloverleaf interchange also provides all movements, but the ramps to and from the interchange become combined. Alternative 16c would also have a trumpet interchange at I-89. However, no connection to US 2 would be provided. A diamond interchange would be provided at Mountain View Road. A diamond interchange provides all movements at the interchange with separate, non-curved ramps.

Alternative 17 (Circ A/B Boulevard) would have a diamond interchange with roundabouts at I-89, and at-grade signalized intersections with US 2 and Mountain View Road.

Hybrid Alternatives (18, 19, 23)

The defining characteristic of the Hybrid Alternatives is that they combine widening and intersection improvements on VT 2A with a local street-type roadway in the existing Circ A right-of-way, from I-89 to Mountain View Road. This roadway in the Circ A right-of-way is called the “Circ Street” in this DEIS.

The Circ Street would have a diamond interchange with roundabouts at I-89, and at-grade signalized intersections with US 2 and Mountain View Road. These at-grade intersections could be either signalized or roundabout intersections. The Circ Street would have four lanes with a landscaped median from I-89 to US 2, and two travel lanes with no median between the travel lanes from US 2 to Mountain View Road. The Circ Street terminates at Mountain View Road and has the same design in Alternatives 18, 19 and 23.

In addition to a common Circ Street, Alternatives 18, 19 and 23 would involve different types of widening and intersection improvements on VT 2A. The improvements on VT 2A would be identical to those described for Alternatives 2, 3 and 22, specifically:

- Alternative 18—(Alternative 2 VT 2A Improvements plus Circ Street)
- Alternative 19—(Alternative 3 VT 2A Improvements plus Circ Street)
- Alternative 23—(Alternative 22 VT 2A Improvements plus Circ Street)

ES-4 Traffic and Transportation

The traffic and transportation performance of the Build Alternatives was analyzed to determine the effectiveness of each alternative in addressing the four elements of the project purpose and need statement:

- Relieve congestion (at intersections and on roadway segments between intersections),
- Improve safety,
- Reduce truck traffic on local roadways, and
- Improve mobility.

The effectiveness of the Build Alternatives was compared to 2030 traffic conditions under the No Build Alternative. Detailed information on the measures used to assess the effectiveness of the Build Alternatives and the results of the analyses are provided in Chapter 5: *Traffic and Transportation Effects of the Evaluated Alternatives*.

VT 2A Alternatives

Alternatives 3 would effectively address the “relieve congestion” element of the purpose and need at intersections, while Alternatives 2 and 22 would not effectively address this element. None of the VT 2A Alternatives would effectively address the “reduce truck traffic on local roadways” element of the purpose and need. Alternative 3 would effectively address the “relieve congestion” element of the purpose and need on roadway segments, while Alternatives 2 and 22 would not effectively address this element.

All of the VT 2A Alternatives would effectively address the “improve safety” element of purpose and need. Alternatives 2 and 3 would effectively address the “improve mobility” element of purpose and need, while Alternative 22 would not effectively address this element.

Circ A/B Alternatives





All of the Circ A/B Alternatives would effectively address the following elements of the purpose and need:

- “relieve congestion” on roadway segments,
- “improve safety,”
- “reduce truck traffic on local roadways,” and
- “improve mobility”.




Alternatives 16a, 16c and 17 would effectively address the “relieve congestion” element of the purpose and need at intersections, while Alternative 16b would not effectively address this element.



Legend

-  Signalized Improvements
-  Spot Improvements
-  Roundabout
-  Typical Cross Section Location

Interchange Types:

-  1 Trumpet Interchange
-  2 Partial Coverleaf Interchange
-  3 Diamond Interchange

Circ-Williston EIS

VT2A Alternatives

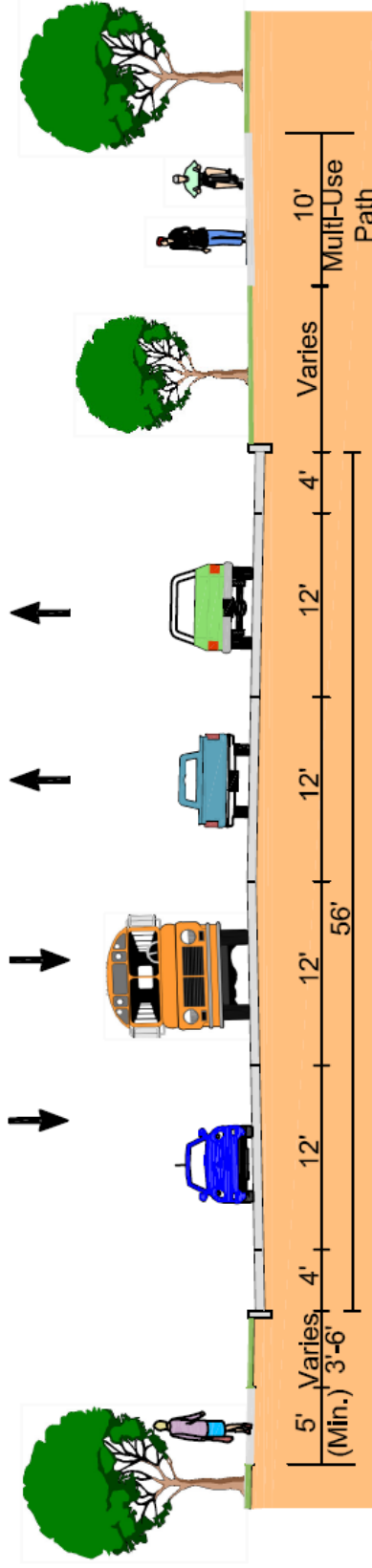
Figure ES 3.1-1a

**Alternative 2:
Four-lane VT2A with signalized
intersection improvements**




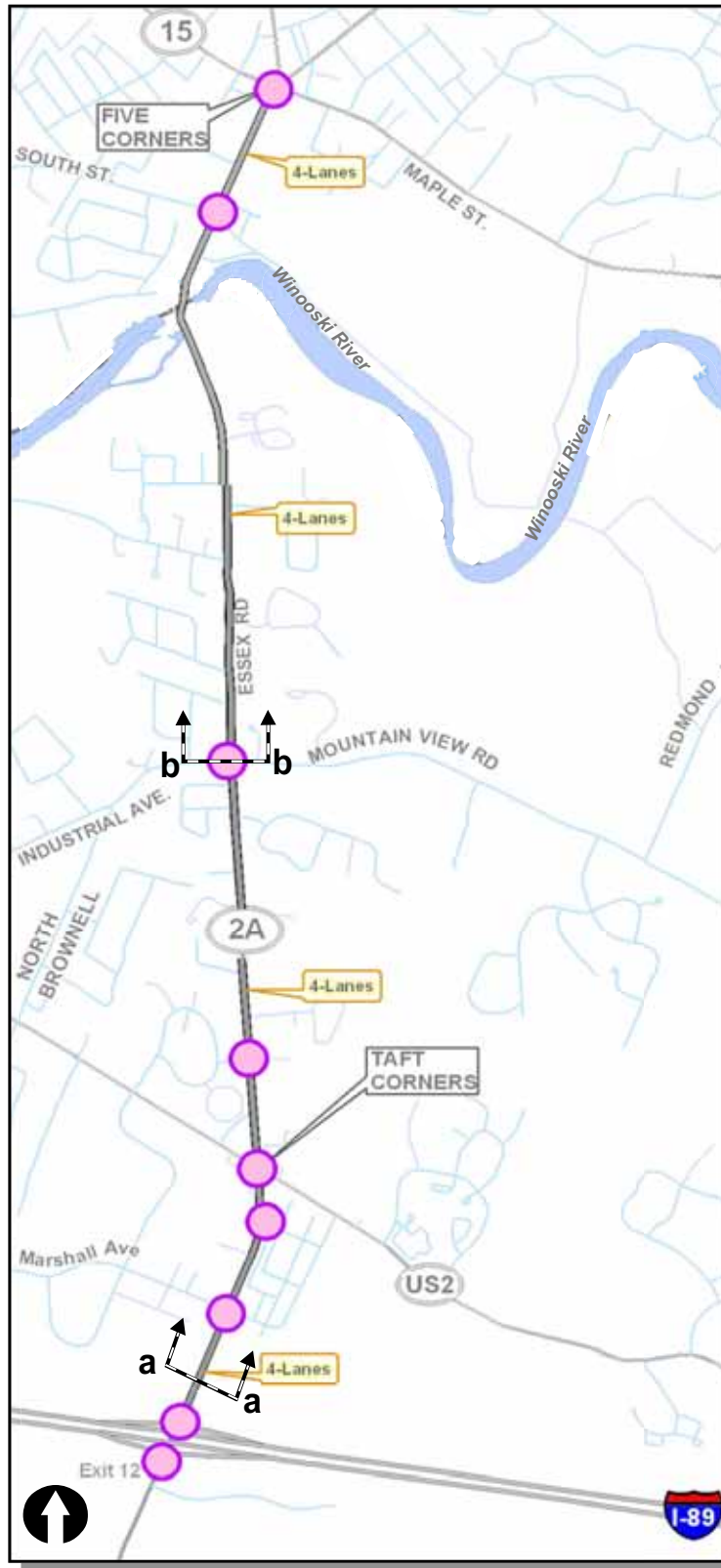
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Four-lane VT 2A including a sidewalk on the west side and a multi-use path on the east side.

Circ-Williston EIS
VT2A Alternatives
Figure ES 3.1-1b
Alternative 2: Typical Cross Sections
 Vermont Agency of Transportation






Legend

-  Signalized Improvements
-  Spot Improvements
-  Roundabout

 Typical Cross Section Location

Interchange Types:

-  1 Trumpet Interchange
-  2 Partial Coverleaf Interchange
-  3 Diamond Interchange

Circ-Williston EIS

VT2A Alternatives

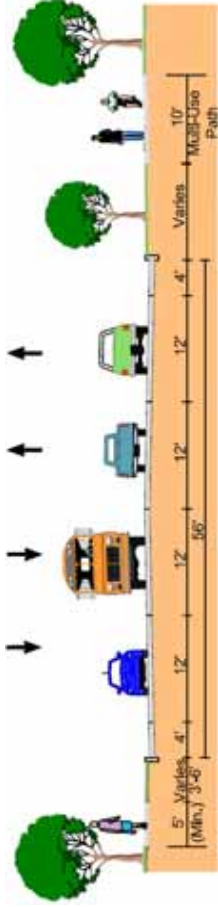
Figure ES 3.1-2a

**Alternative 3:
Four-lane VT2A with roundabouts**



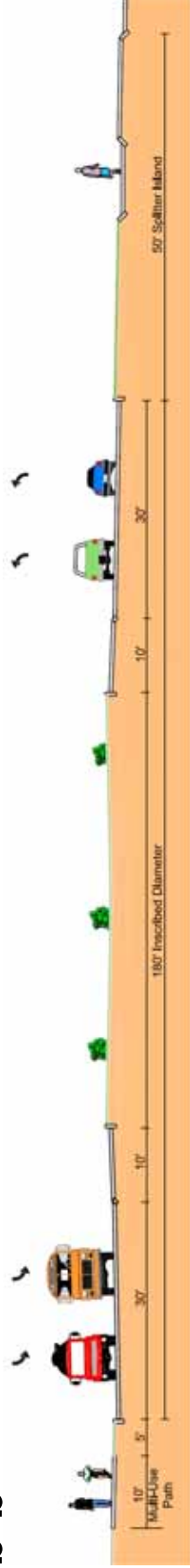
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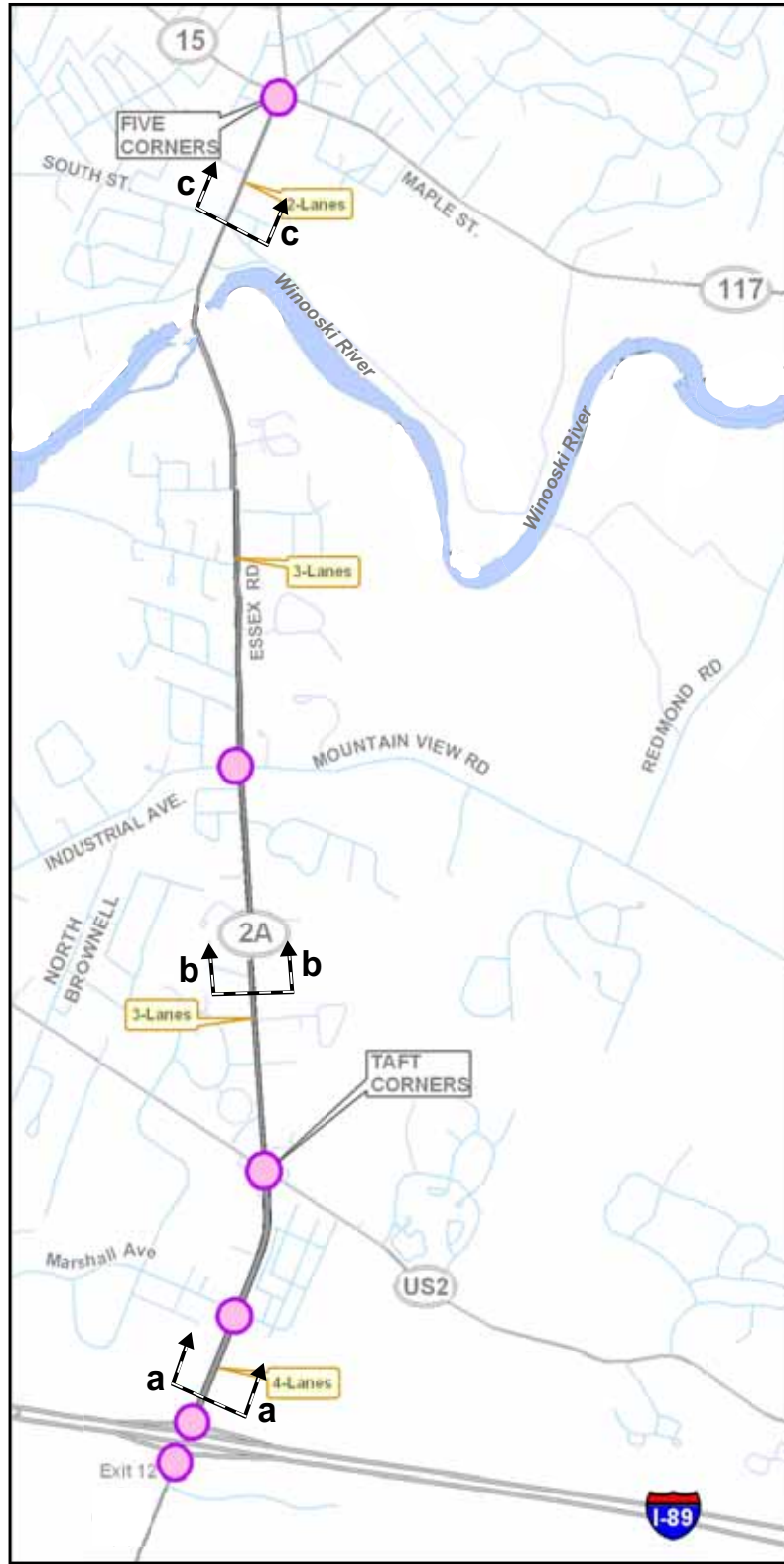
Four-lane VT 2A including a sidewalk on the west side and a multi-use path on the east side.

b-b







Typical two-lane roundabout including a landscaped island with apron. A multi-path would be located on the west side of the intersection of VT 2A and Mountain View Road. A splitter would be located on the east side to accommodate pedestrian travel.




Circ-Williston EIS
VT2A Alternatives
Figure ES 3.1-2b
Alternative 3: Typical Cross Sections
 Vermont Agency of Transportation



Legend

-  Signalized Improvements
-  Spot Improvements
-  Roundabout
-  Typical Cross Section Location

Interchange Types:

-  1 Trumpet Interchange
-  2 Partial Coverleaf Interchange
-  3 Diamond Interchange

Circ-Williston EIS

VT2A Alternatives

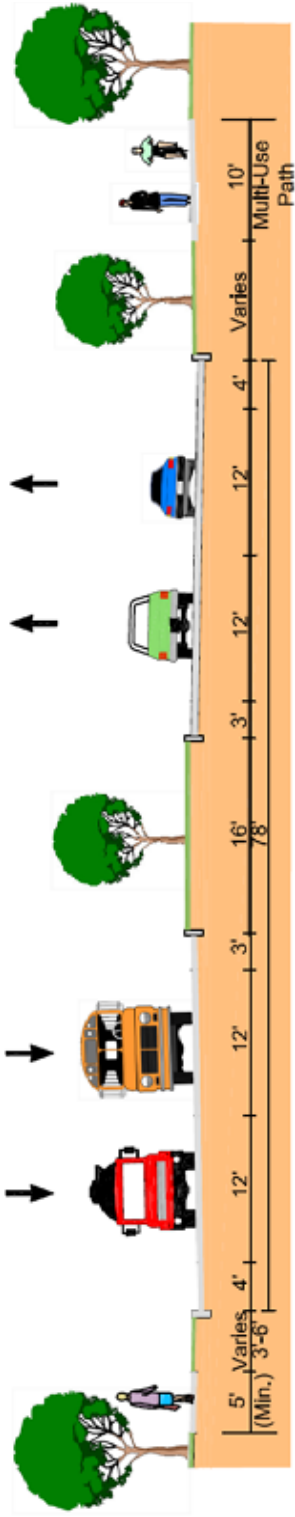
Figure ES 3.1-3a

Alternative 22:
Tapered widening on VT2A with
signalized and roundabout intersections



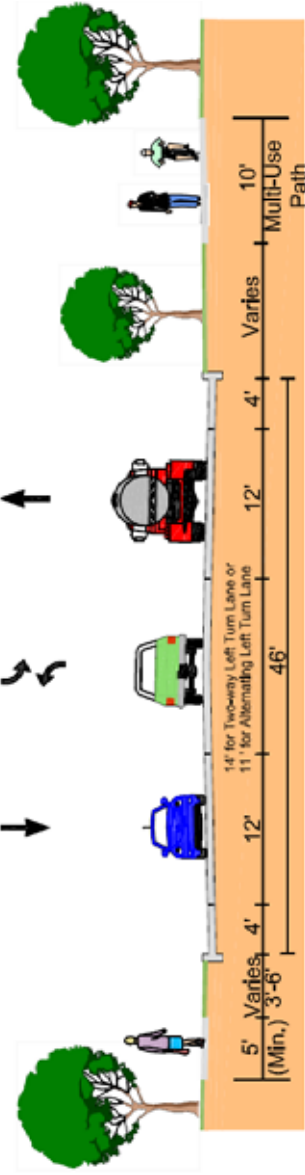
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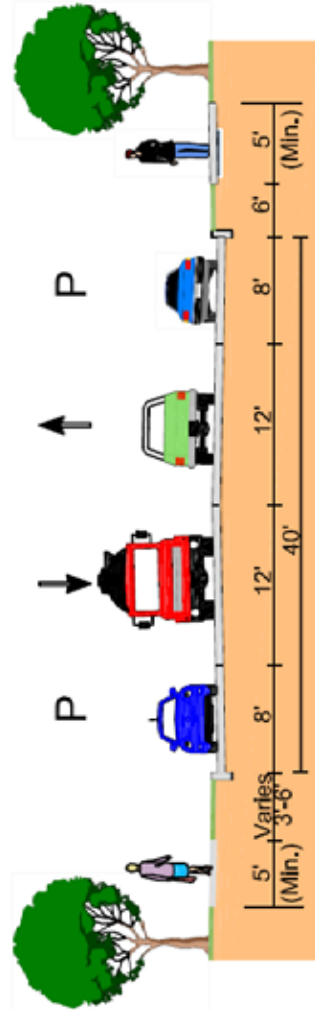
Four-lane VT 2A with a raised median, a sidewalk on the west side and a multi-use path on the east side.

b-b




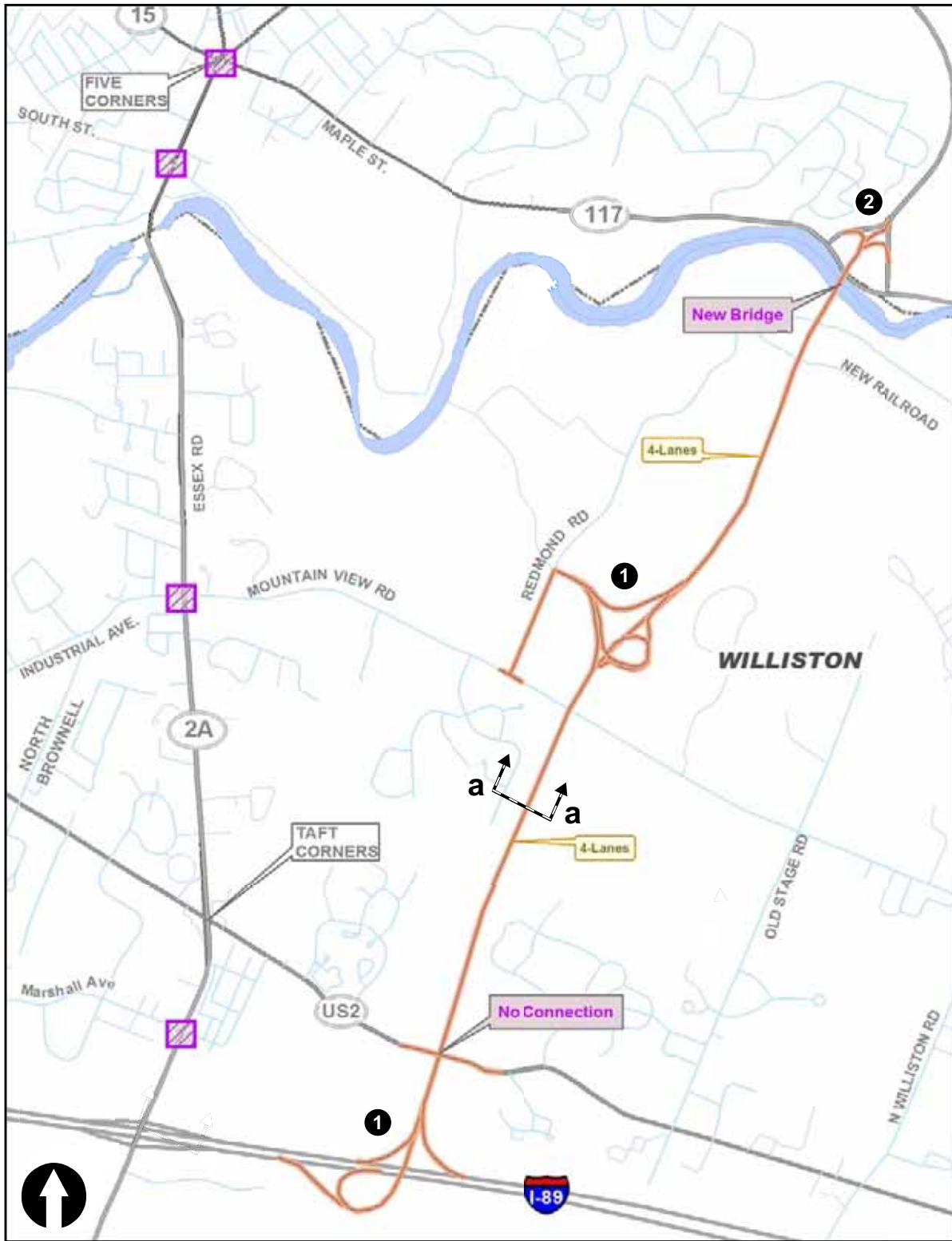
Three-lane VT 2A including two-way left turn lane or alternating left turn lane, sidewalk on the west side and a multi-use path on the east side.

C-C



Two-Lane VT 2A, including parking and sidewalks on both sides.

Circ-Williston EIS
VT2A Alternatives
Figure ES 3.1-3b Alternative 22: Typical Cross Sections
 Vermont Agency of Transportation



Legend

- Signalized Improvements
- Spot Improvements
- Roundabout
- Typical Cross Section Location

Interchange Types:

- Trumpet Interchange
- Partial Coverleaf Interchange
- Diamond Interchange

Circ-Williston EIS

CIRC A/B Alternatives

Figure ES 3.1-4a

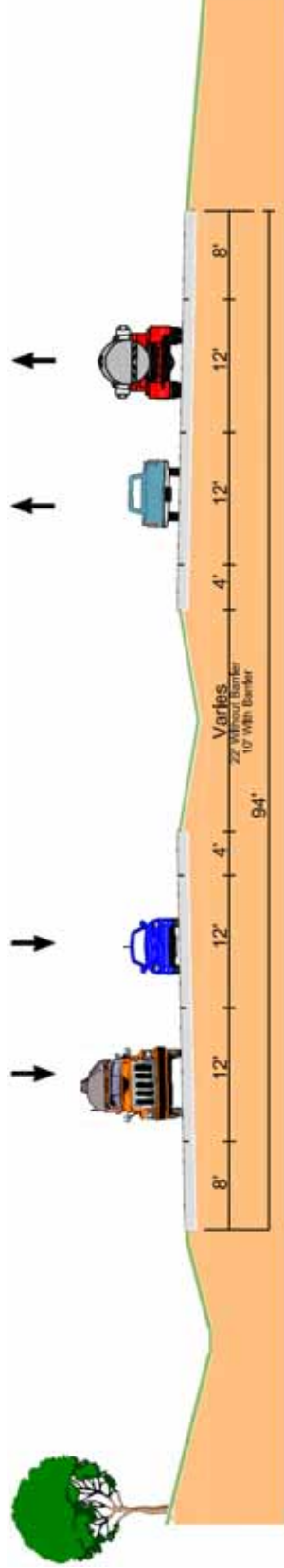
Alternative 16a:

Circ A/B limited access highway with VT 2A spot improvements. No connection to US 2, and a trumpet interchange with Redmond Road.




Vermont Agency of Transportation

a-a







Four-lane Circ A/B limited access highway, including shoulders and grass median.




Circ-Williston EIS
CIRC A/B Alternatives
Figure ES 3.1-4b
Alternative 16a: Typical Cross Sections
 Vermont Agency of Transportation



Legend

-  Signalized Improvements
-  Spot Improvements
-  Roundabout
-  Typical Cross Section Location

Interchange Types:

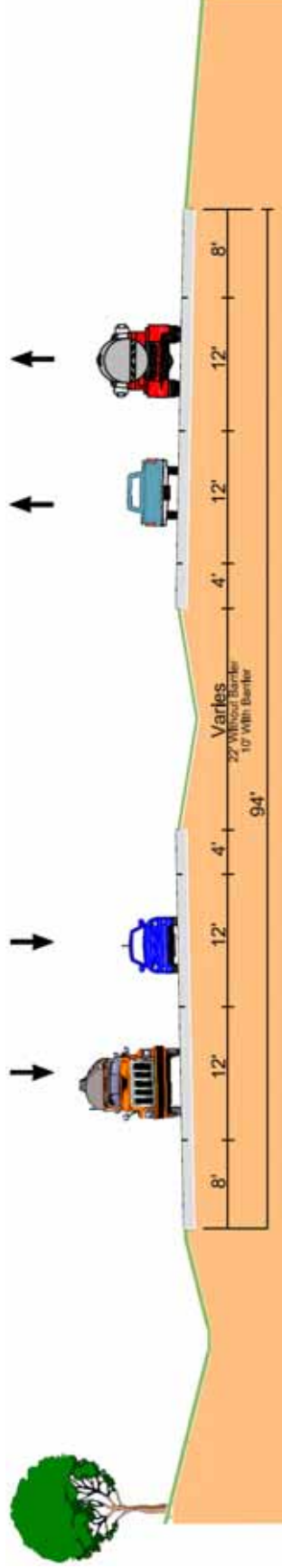
-  1 Trumpet Interchange
-  2 Partial Coverleaf Interchange
-  3 Diamond Interchange

Circ-Williston EIS
CIRC A/B Alternatives
Figure ES 3.1-5a
Alternative 16b:
Circ A/B limited access highway with
VT 2A spot improvements.
Partial cloverleaf interchange
at US 2 and a trumpet interchange
with Redmond Road.




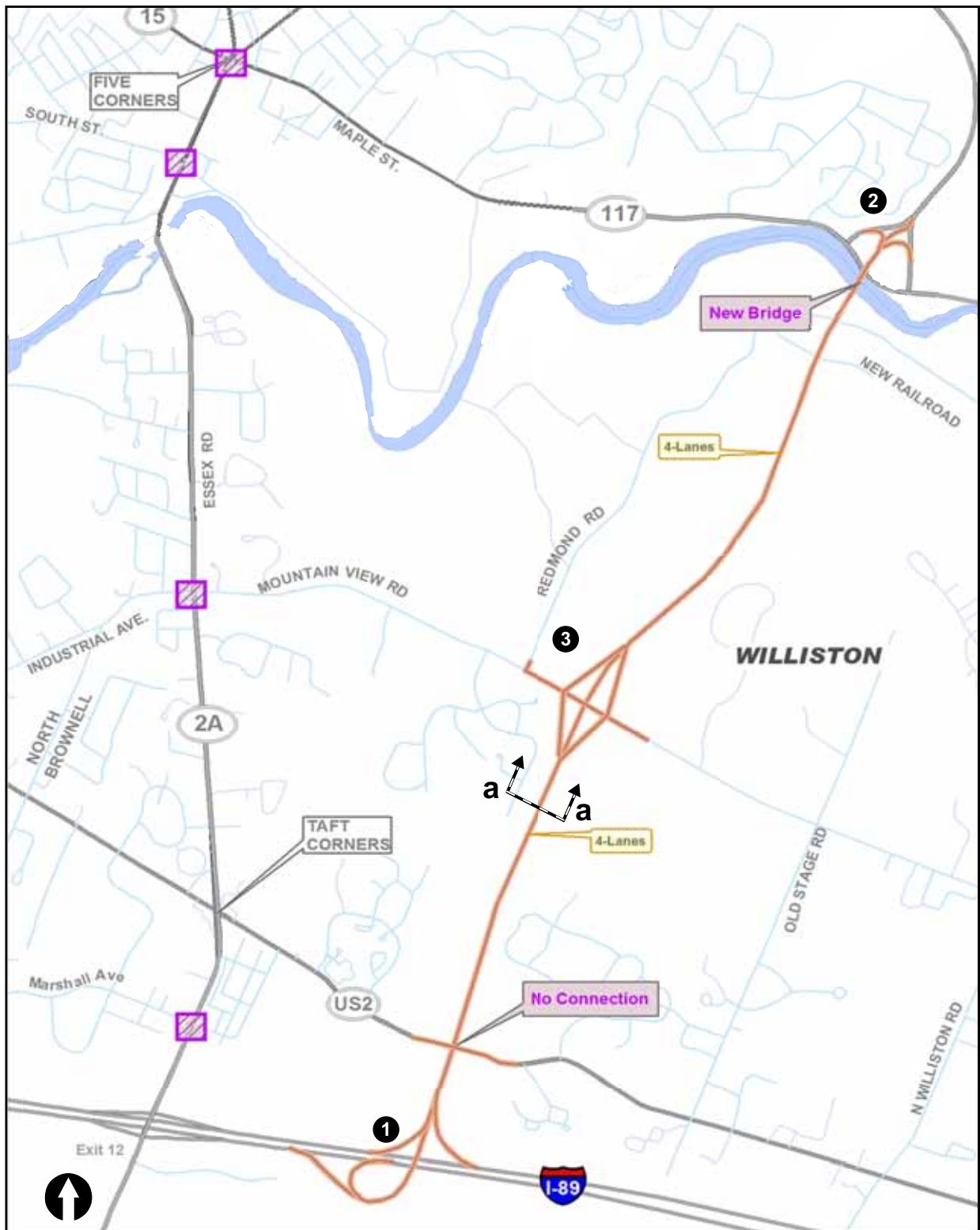
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Four-lane Circ A/B limited access highway, including shoulders and grass median.




Circ-Williston EIS
CIRC A/B Alternatives
Figure ES 3.1-5b
Alternative 16b: Typical Cross Sections
 Vermont Agency of Transportation



Legend

-  Signalized Improvements
-  Spot Improvements
-  Roundabout
-  Typical Cross Section Location

Interchange Types:

-  1 Trumpet Interchange
-  2 Partial Coverleaf Interchange
-  3 Diamond Interchange

Circ-Williston EIS

CIRC A/B Alternatives

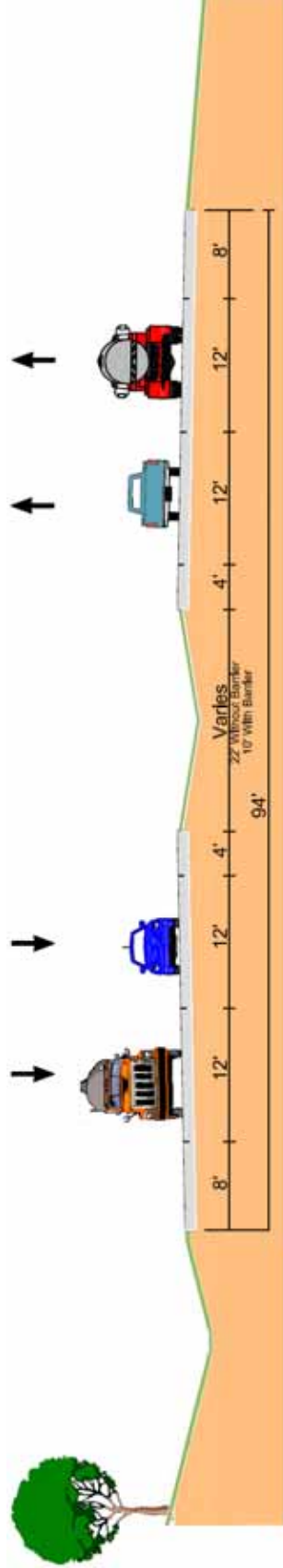
Figure ES 3.1-6a

Alternative 16c:
 Circ A/B limited access highway with
 VT 2A spot improvements.
 No connection to US 2, and a diamond
 interchange at Mountain View Road.




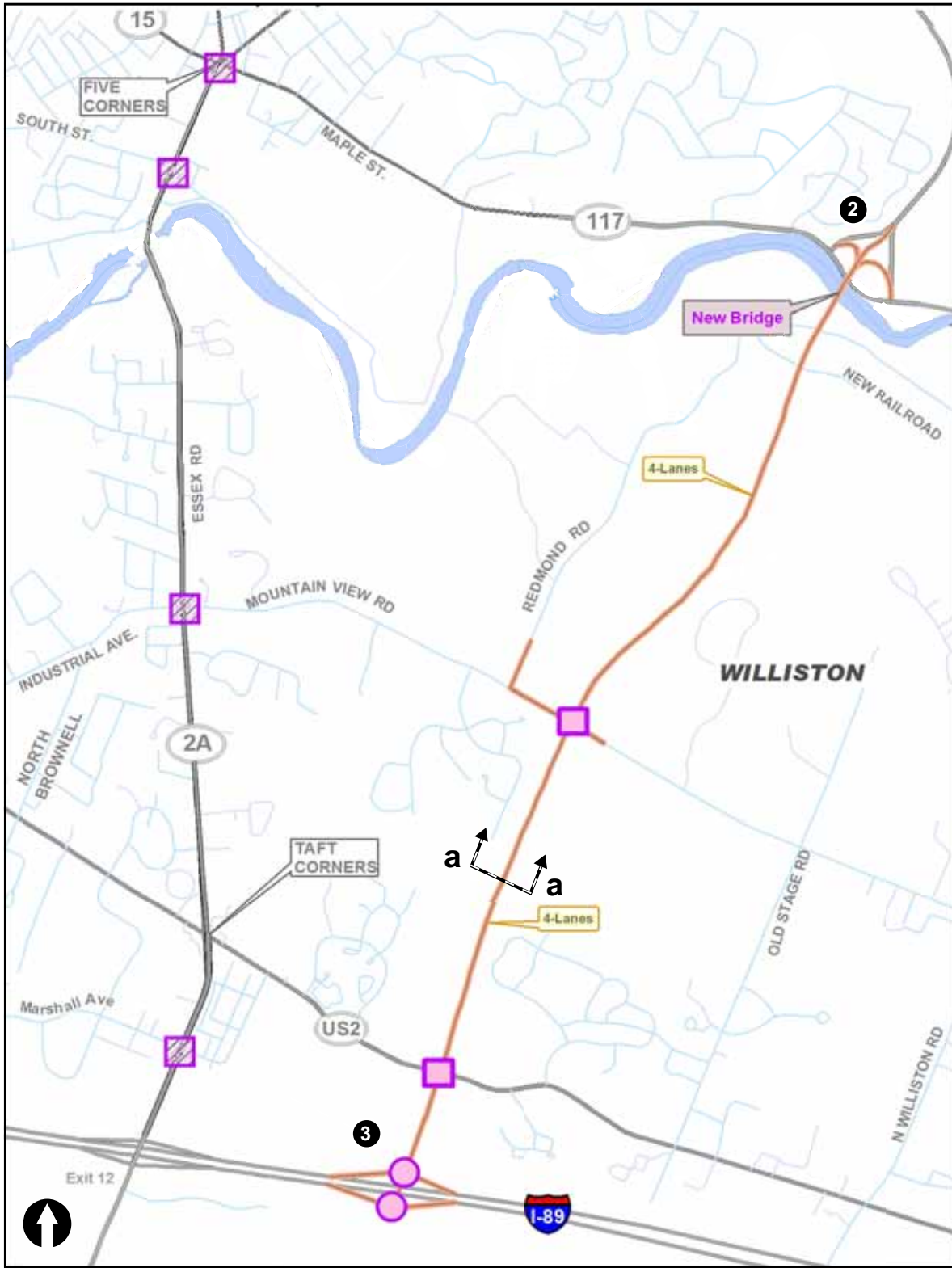
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




Four-lane Circ A/B limited access highway, including shoulders and grass median.




Circ-Williston EIS
CIRC A/B Alternatives
Figure ES 3.1-6b
Alternative 16c: Typical Cross Sections
 Vermont Agency of Transportation



Legend

-  Signalized Improvements
-  Spot Improvements
-  Roundabout
-  Typical Cross Section Location

Interchange Types:

-  1 Trumpet Interchange
-  2 Partial Coverleaf Interchange
-  3 Diamond Interchange

Circ-Williston EIS

CIRC A/B Alternatives

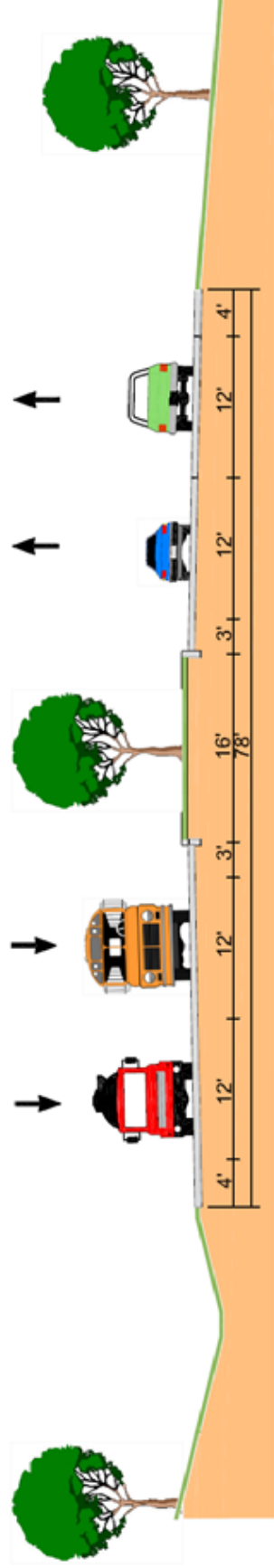
Figure ES 3.1-7a

**Alternative 17:
Circ A/B Boulevard with VT2A
spot improvements**




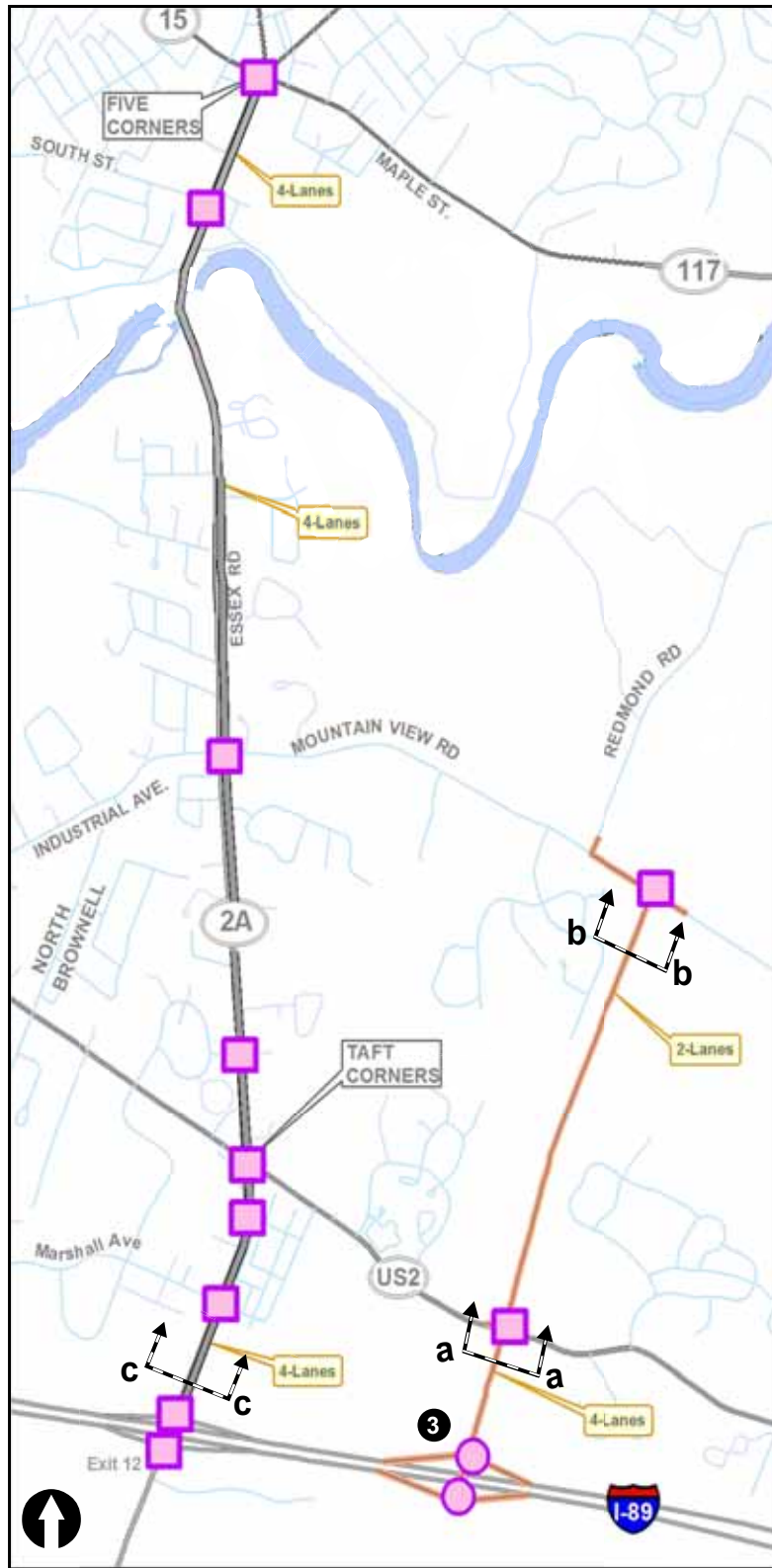
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Four-lane Circ A/B boulevard, including shoulders and a landscaped median.




Circ-Williston EIS
CIRC A/B Alternatives
Figure ES 3.1-7b
Alternative 17: Typical Cross Sections
 Vermont Agency of Transportation




Legend

-  Signalized Improvements
-  Spot Improvements
-  Roundabout

Interchange Types:

-  1 Trumpet Interchange
-  2 Partial Coverleaf Interchange
-  3 Diamond Interchange

 Typical Cross Section Location

Circ-Williston EIS

Hybrid Alternatives

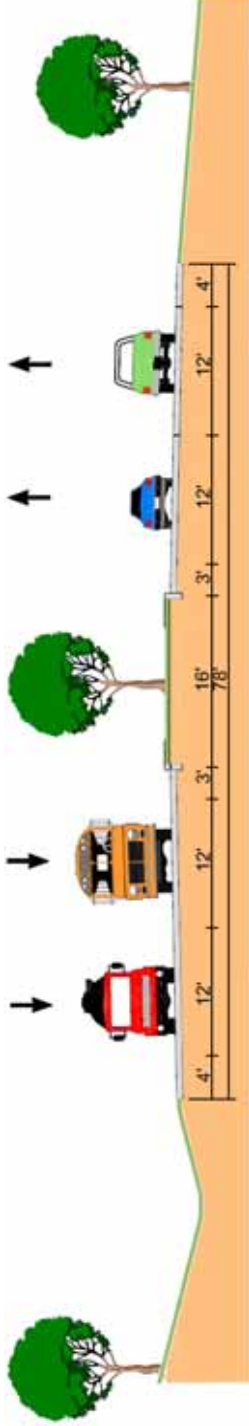
Figure ES 3.1-8a

Alternative 18:
Four-lane VT2A with signalized intersection improvements plus Circ Street.



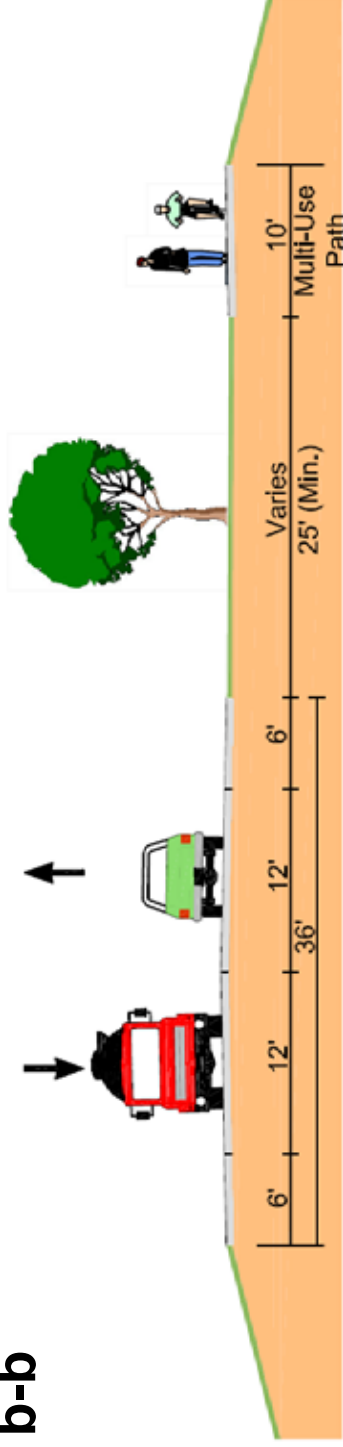
Vermont Agency of Transportation

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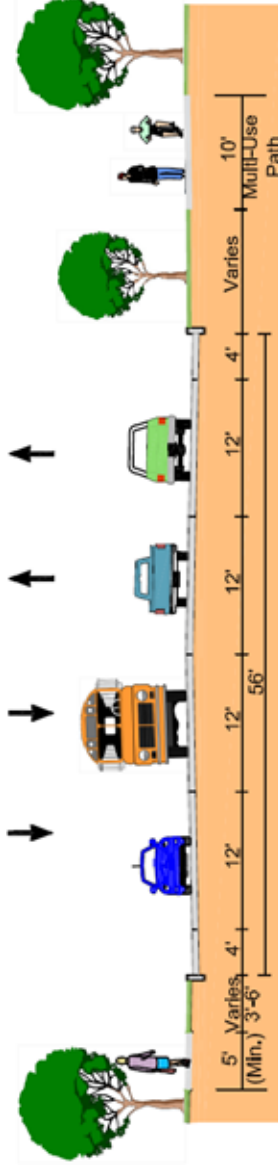
Four-lane Circ street boulevard, with a landscaped median.

b-b




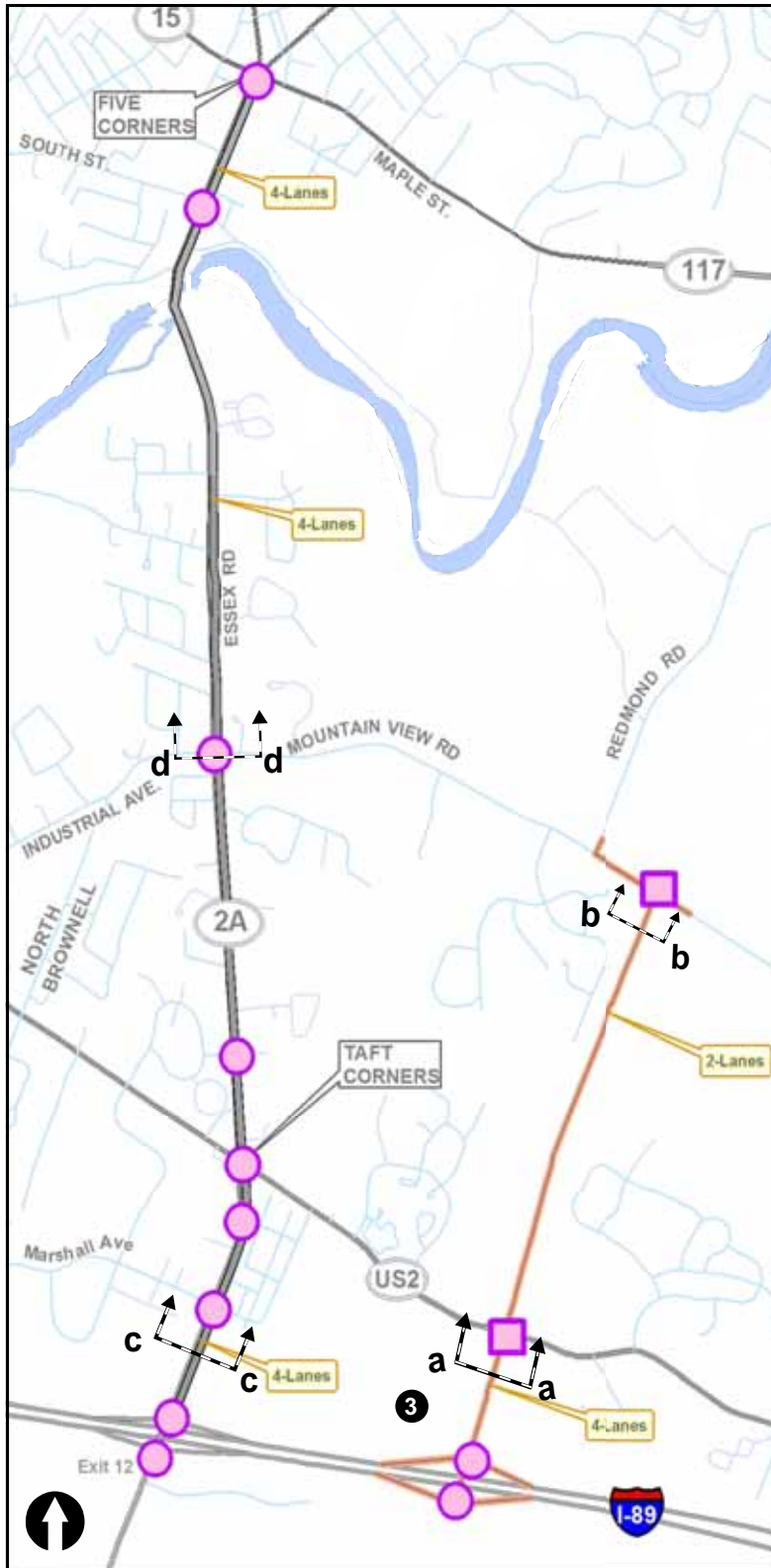
Two-lane Circ street with a multi-use path on the east side, separated from the roadway by a landscaped buffer.

C-C







Four-lane VT 2A including a sidewalk on the west side and a multi-use path on the east side.

Circ-Williston EIS
Hybrid Alternatives
Figure ES 3.1-8b
Alternative 18: Typical Cross Sections
 Vermont Agency of Transportation






Legend

-  Signalized Improvements
-  Spot Improvements
-  Roundabout

 Typical Cross Section Location

Interchange Types:

-  1 Trumpet Interchange
-  2 Partial Coverleaf Interchange
-  3 Diamond Interchange

Circ-Williston EIS

Hybrid Alternatives

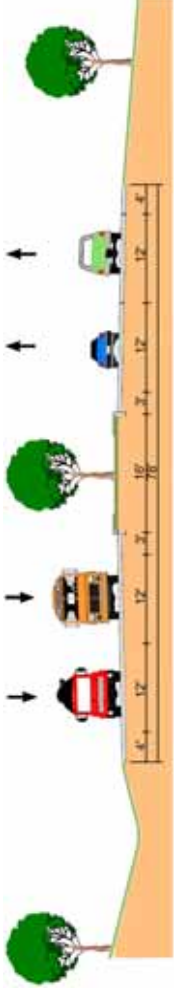
Figure ES 3.1-9a

Alternative 19:
Four-lane VT2A with
roundabouts plus Circ street



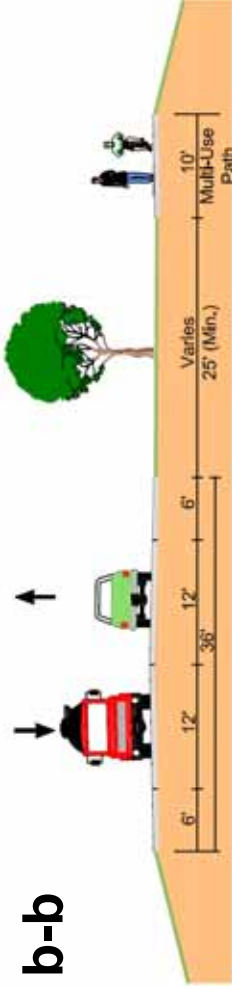
Vermont Agency of
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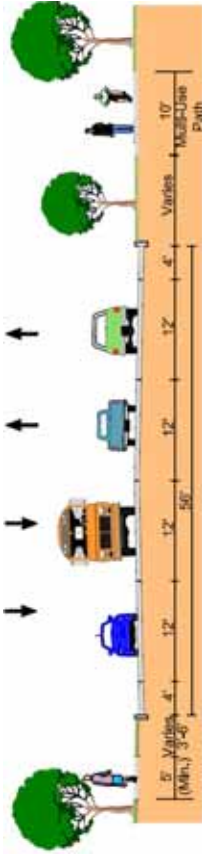
Four-lane Circ street boulevard, with a landscaped median.

b-b



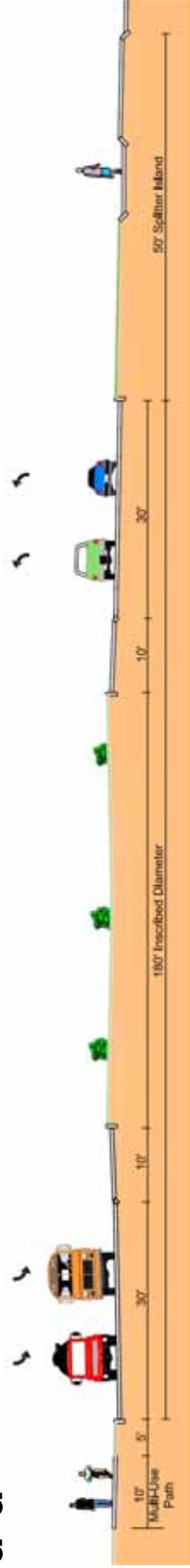
Two-lane Circ Street with a multi-use path on the east side, separated from the roadway by a landscaped buffer.

C-C



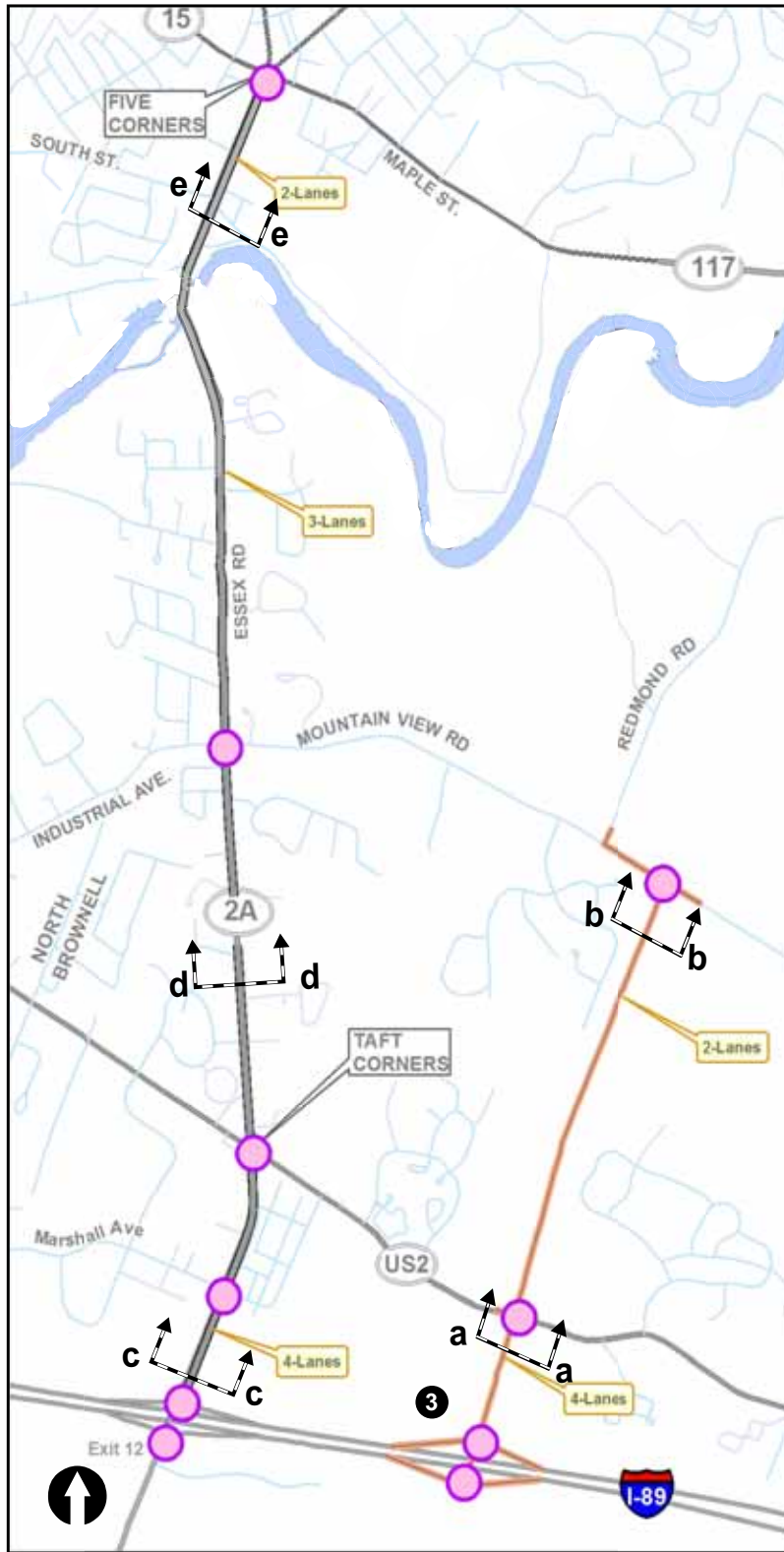
Four-lane VT 2A including a sidewalk on the west side and a multi-use path on the east side.

d-d







Typical two-lane roundabout including a landscaped island with apron. A multi-path would be located on the west side of the intersection of VT 2A and Mountain View Road. A splitter would be located on the east side to accommodate pedestrian travel.








Legend

-  Signalized Improvements
-  Spot Improvements
-  Roundabout
-  Typical Cross Section Location

Interchange Types:

-  1 Trumpet Interchange
-  2 Partial Coverleaf Interchange
-  3 Diamond Interchange

Circ-Williston EIS

Hybrid Alternatives

Figure ES 3.1-10a

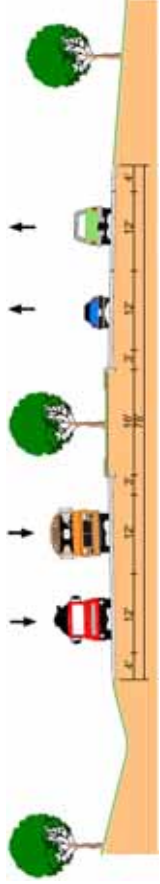
Alternative 23

Tapered widening on VT2A with signalized and roundabout intersections plus Circ street.



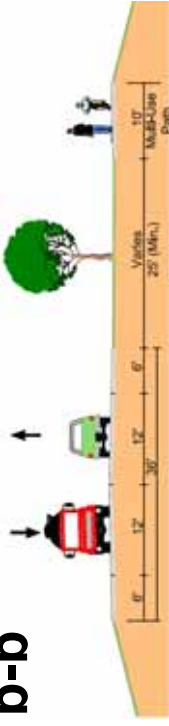
Vermont Agency of Transportation

a-a



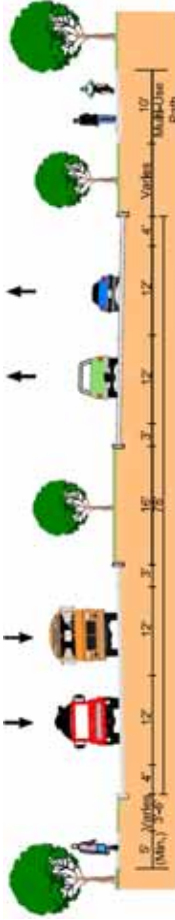
Four-lane Circ street boulevard, with a landscaped median.

b-b



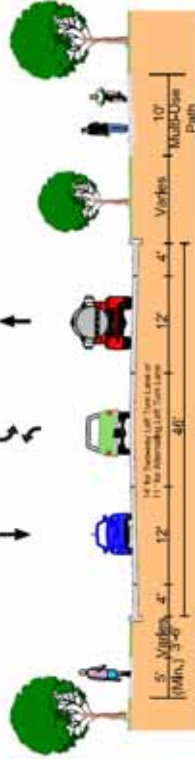
Two-lane Circ street with a multi-use path on the east side, separated from the roadway by a landscaped buffer.

C-C



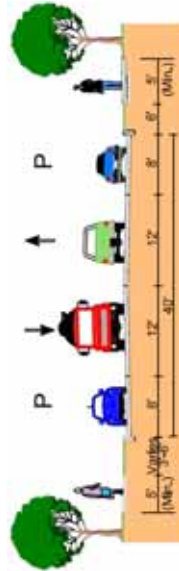
Four-lane VT 2A with a raised median, a sidewalk on the west side and a multi-use path on the east side.

d-d




Three-lane VT2A including two-way left turn land or alternating left turn lane, sidewalk on the west side and a multi-use path on the east side.

e-e



Two-Lane VT 2A, including parking and sidewalks on both sides.

Circ-Williston EIS
Hybrid Alternatives
Figure ES 3.1-10b
Alternative 23: Typical Cross Sections
 Vermont Agency of Transportation

Hybrid Alternatives

Alternatives 19 and 23 would effectively address the “relieve congestion” element of the purpose and need at intersections, while Alternative 18 would not effectively address this element. Alternatives 18 and 19 would effectively address the “relieve congestion” element of the purpose and need on roadway segments, while Alternative 23 would not effectively address this element. All of the Hybrid Alternatives would effectively address the “improve safety” element of purpose and need. None of the Hybrid Alternatives would effectively address the “reduce truck traffic on local roadways” element of the purpose and need. Alternatives 18 and 19 would effectively address the “improve mobility” element of purpose and need, while Alternative 23 would not effectively address this element.

ES-5 Land Use

The residential and business displacements along VT 2A under the VT 2A and Hybrid Alternatives along the Circ A/B corridor under Alternative 16b would not alter overall land use patterns.

The plans of Williston, Essex and Essex Junction support the completion of the Chittenden County Circumferential Highway as part of their master plan transportation elements. Therefore, the No Build, VT 2A and Hybrid Alternatives are not consistent with these plans. The VT 2A and Hybrid Alternatives would be inconsistent with the Essex Junction Redevelopment Plan for streetscape improvements and additional on-street parking at Five Corners. Alternatives 16b, and 17 would be inconsistent with the aspect of the Town of Williston plan calling for the CCCH to have no connection to US 2.

None of the alternatives would directly affect active farming. The VT 2A Alternatives would result in the conversion of less than one acre of farmland soils of statewide importance. Although Alternative 16a would be accommodated within the existing state-owned right-of-way and would not require the acquisition of farmland soils, Alternatives 16b, 16c, 17 and the Circ Street portion of the Hybrid Alternatives would require approximately 2.5 to fourteen acres of farmland soils of statewide importance to be acquired beyond those in the existing Circ A/B right-of-way.

The VT 2A and Hybrid Alternatives would require the relocation of the existing Williston Alternative Transportation Path (WATP) along VT 2A. Alternatives 3, 22, 19 and 23 would require a partial take of the Veterans Memorial Park at the Five Corners intersection in Essex Junction, as a result of the design of the roundabout intersection.

The Circ A/B Alternatives would require the relocation of the Williston Alternative Transportation Path (WATP) that crosses the corridor near the Allen Brook School. The WATP would be constructed on an overpass over the proposed roadway to maintain pedestrian and bicycle connectivity. Under the Hybrid Alternatives, the WATP would have an at-grade signalized crossing of the Circ Street.

More detailed information is provided in Chapter 6.0: Effects of the Evaluated Alternatives on Land Use.

ES-6 Social and Economic Conditions

Under the No Build Alternative, substantial household and employment growth is expected to occur in the project area through the year 2030. Current levels of neighborhood cohesion in the

VT 2A and Circ A/B corridors would strengthen as newly developed neighborhoods become established and connections between commercial and residential areas expand.

The VT 2A and Hybrid Alternatives would result in the displacement of one to six residences and four to five businesses along VT 2A. There is an adequate housing supply available in the local area to accommodate the residents that could be displaced and it is unlikely that the displacement of the affected businesses would have any widespread effect on the local economy or employment. Compensation for displacements would be conducted according to the Uniform Relocation Assistance and Real Property Acquisition Policies Act.

The displacements of residences and businesses that would occur in the VT 2A corridor under the VT 2A and Hybrid Alternatives are not concentrated in any one neighborhood, and therefore will not impact existing neighborhood character or neighborhood cohesion. Improvements to VT 2A as part of the VT 2A and Hybrid Alternatives would create a wider roadway profile that could be incompatible with community character in residential areas, north of Blair Park in Williston and in the Village of Essex Junction.

In the Circ A/B corridor, Alternative 16b would result in one residential displacement. This displacement would not affect community character or cohesion. Pedestrian and bicycle connection between neighborhoods on either side of the Circ A/B corridor would be maintained through the construction of the Williston Alternative Transportation Path (WATP) on an overpass (Circ A/B Alternatives), or an at-grade signalized crossing (Hybrid Alternatives).

Under the VT 2A and Hybrid Alternatives, the loss of municipal tax revenue due to property acquisitions would be up 0.4 percent of total grand list revenues in Williston, Essex and Essex Junction. Under the Circ A/B Alternatives, the loss of municipal tax revenue due to property acquisitions would be up 0.1 percent of total grand list revenues in Williston.

More detailed information is provided in Chapter 7.0: Effects of the Evaluated Alternatives on Social and Economic Conditions.

ES-7 Air Quality

Under the No Build and all the Build Alternatives, no exceedances of the National Ambient Air Quality Standards (NAAQS) are anticipated. The NAAQS regulate the concentration of the six criteria pollutants regulated under the Clean Air Act, ozone, volatile organic compounds (VOCs), nitrogen dioxide (a form of NO_x), carbon monoxide (CO), particulate matter (PM-10), sulfur dioxide and lead.

NO_x and VOC and Mobile Source Air Toxics emissions would decrease in the future under the No Build and all Build Alternatives.

More detailed information is provided in Chapter 8.0: Effects of the Evaluated Alternatives on Air Quality.

ES-8 Noise

Under the No Build Alternative, noise levels along VT 2A would range from 55 to 71 dBA and be similar to existing noise levels, which are primarily influenced by traffic noise. Noise levels along the Circ A/B corridor are predicted to remain close to existing noise levels, which are in the mid-40 and mid-50 dBA range (typical for rural and/or suburban environments).

In the VT 2A corridor, under the VT 2A Alternatives (2, 3, 22), future noise levels are predicted to exceed the 67 dBA noise abatement criterion at 60 to 84 sensitive receptors, depending on the alternative. As a result of the Circ A/B Alternatives (16a, 16b, 16c, 17), future noise levels are predicted to exceed the 67 dBA criterion at 39 to 52 receptors along VT 2A, depending on the alternative. Under the Hybrid Alternatives (18, 19, 23), future noise levels are expected to exceed the 67 dBA criterion at 59 to 72 receptors along VT 2A, depending on the alternative. Pursuant to VTrans noise policy, no reasonable mitigation is possible for noise impacts along VT 2A.

In the Circ A/B corridor, Alternative 17 and the Hybrid Alternatives would not result in any exceedences of the noise abatement criteria, while Alternatives 16a, 16b and 16c would result in exceedences of the noise abatement criteria at 33 to 34 sensitive receptors along the Circ A/B corridor. Pursuant to VTrans noise policy, no reasonable mitigation is possible for noise impacts along the Circ A/B corridor.

More detailed information is provided in Chapter 9.0: Effects of the Evaluated Alternatives on Noise.

ES-9 Archaeological and Historic Architectural Resources

Impacts to the character and setting of historic and archaeological resources in the project area could occur as a result of development activity under the No Build Alternative. However, no specific development proposals are known that would have an adverse effect on the historic and archaeological resources identified in the VT 2A and Circ A/B corridors.

Alternatives 3 and 19 would have an adverse effect on seven historic properties eligible or listed on the National Register of Historic Places, while Alternatives 2 and 18 and Alternatives 22 and 23 would result in adverse effects to three historic properties.

The Circ A/B Alternatives and the Circ Street portion of the Hybrid Alternatives would not have an adverse impact on any historic or archaeological resources.

A Phase IB archaeological survey identified archaeologically sensitive sites along VT 2A. Depending on the preferred alternative, further subsurface investigations would need to be conducted in these locations.

More detailed information is provided in Chapter 10.0: Effects of the Evaluated Alternatives on Archaeological and Historic Architectural Resources.

ES-10 Natural and Biological Resources

More detailed information on each of the topics discussed in this section is provided in Chapter 11.0: Effects of the Evaluated Alternatives on Natural and Biological Resources.

ES-10.1 Geology, Soils and Topography

Under the No Build Alternative, soil would be disturbed during construction of other projects in the future in the VT 2A and Circ A/B corridors.

The VT 2A Alternatives would disturb 74.3 to 79.6 acres of soil surface during construction. Of this amount, 5.1 to 5.5 acres of highly erodible soils would be disturbed.

The Circ A/B Alternatives would disturb 156.8 to 217.2 acres of soil surface during construction. Of this amount, 11.5 to 14.0 acres of highly erodible soils would be disturbed.

The Hybrid Alternatives would disturb 166.3 to 171.4 acres of soil surface during construction. Of this amount, 6.4 to 6.9 acres of highly erodible soils would be disturbed.

ES-10.2 Surface Water and Groundwater Resources

Under the No Build Alternative, impacts to surface water quality are possible due to future residential and commercial growth, and the corresponding increases in impervious surface cover. The future condition of surface water resources depends on the effectiveness of current and future regulations, the amount of future growth, and the response of natural systems to changes. For this reason, water quality impact estimates used the existing conditions of waterbodies in the project area as a baseline.

The effect of the Build Alternatives on sediment, nutrient and metal loadings accounts for the effect of the stormwater treatment practices that would be included as part of any of the Build Alternatives. Deicing salt cannot be removed by stormwater treatment practices.

The VT 2A Alternatives would result in negligible change (order of magnitude in the hundredths of one percent) in pollutant loadings to Allen Brook. There would be similarly negligible change in pollutant loadings to Muddy Brook and the Winooski River.

The VT 2A Alternatives would result in a 0.2 mg/l to 1.6 mg/l increase in the average annual chloride concentration in the Unnamed Tributary of Muddy Brook at RM 0.2 (South Brownell Road). At RM 0.2 the existing mean chloride concentration 369.1 mg/l in excess of the 230 mg/l EPA recommended criterion for chloride aquatic life toxicity.

Under Alternatives 16a and 17 there would be negligible change (order of magnitude in the hundredths of one percent or less) in sediment loadings to Allen Brook. Under Alternatives 16b and 16c there would be a small (less than one-percent) decrease in sediment loadings to Allen Brook. There would be an increase in the loading of other pollutants in the Allen Brook watershed, including a less than one-percent increase in phosphorus loadings under Alternatives 16a, 16b, 16c and 17. A range of results, including increases, decreases and non-measurable changes in pollutant loadings are predicted for Redmond Creek, Winooski Tributary (1) and the Winooski River.

The Circ A/B Alternatives are not expected to contribute to any waterbodies exceeding the EPA recommended criterion for chloride aquatic life toxicity (230 mg/l). The largest increase in chloride concentrations would occur in the Unnamed Tributary of the Winooski (1) at its confluence with the Winooski River (28.3 to 42.3 mg/l), however the total estimated chloride concentration in this waterbody would be less than half of the 230 mg/l criterion.

Under the Hybrid Alternatives, there would be a small (less than one-percent) decrease sediment loadings to Allen Brook. Nutrient and metal loadings to Allen Brook would increase, up to half a percent, depending on the pollutant and alternative. There would be negligible change in the pollutant loadings to Muddy Brook and the Winooski River. In Winooski Tributary 1, pollutant loadings vary, from a decrease of 1.42 percent, to an increase of 0.54 percent, depending on the pollutant.

The Hybrid Alternatives would result in a 0.2 to 1.6 mg/l increase in the average annual chloride concentration in the Unnamed Tributary of Muddy Brook at RM 0.2 (South Brownell Road).

Muddy Brook, Allen Brook, Winooski Tributary (1) and the Winooski River are not expected to exceed the EPA recommended criterion for chloride aquatic life toxicity (230 mg/l). The largest increase in chloride concentrations would occur in the Unnamed Tributary of the Winooski (1) at its confluence with the Winooski River (8.8 mg/l), however the total estimated chloride concentration in this waterbody would be less than one third of the 230 mg/l criterion.

ES-10.3 Floodplains

No floodplains would be encroached upon under the No Build Alternative, primarily due to the development restrictions of floodplain zoning along Allen Brook and the Winooski River.

The VT 2A Alternatives would permanently encroach on 0.5 acres of the FEMA 100-year floodplain. The Circ A/B and Hybrid Alternatives would also encroach on 2.0 to 8.1 and 1.8 acres of the 100-year floodplain respectively. The Circ A/B Alternatives would require a new four-lane bridge over the Winooski River.

The VT 2A Alternatives would encroach on 1.0 to 1.1 acres of the VANR DEC Allen Brook floodway, while the Circ A/B and Hybrid Alternatives would encroach on 1.7 to 10.1 and 3.0 to 3.1 acres, respectively.

Roadway design and stormwater treatment practices will be conducted to avoid adverse impacts to flood flow elevations.

ES-10.4 Vegetation and Vegetative Communities

The No Build Alternative would result in minor changes to vegetative cover as a result of future development.

The VT 2A Alternatives would permanently remove 0.7 to 1.1 acres of forested cover. The Circ A/B Alternatives would remove 29.2 to 47.0 acres of forest cover, while the Hybrid Alternatives would remove 17.6 to 17.9 acres of forest cover.

The VT 2A Alternatives could affect the rare plant species rough avens at the crossing of Allen Brook and rare bryophytes at the crossing of the Winooski River. The Circ A/B Alternatives and the Circ Street portion of the Hybrid Alternatives could also affect rough avens at Allen Brook. Mitigation (e.g., relocation of rough avens) would be conducted in coordination with ANR, as appropriate.

ES-10.5 Wetlands

Under the No Build Alternative, impacts to wetlands could occur as a result of future development. This development is expected to be limited by the regulatory protections afforded wetlands.

Less than two acres of wetlands would be directly impacted in the VT 2A corridor by the VT 2A Alternatives and the VT 2A portion of the Hybrid Alternatives.

Depending on the alternative, the Circ A/B Alternatives would directly impact 24.82 to 36.61 acres of wetlands, while the Circ Street portion of the Hybrid Alternatives would directly impact 20.2 acres of wetlands.

Compensatory wetland mitigation would be conducted as appropriate, depending on the preferred alternative.

ES-10.6 Wildlife and Habitat

Minor impacts to wildlife habitat in the project area would occur as a result of future development under the No Build Alternative.

The impact of the VT 2A Alternatives on wildlife habitat would be minimal, given the existing developed nature of the VT 2A corridor.

The Circ A/B Alternatives would impact 0.13 to 3.17 acres of deer wintering habitat and potentially 0.84 acres of wood frog breeding habitat. The Circ A/B Alternatives would also isolate 28 acres of deer wintering habitat from a 633 acre deer wintering area. The Hybrid Alternatives would impact 3.17 acres of deer wintering habitat, but would not impact wood frog breeding habitat.

Wildlife habitat mitigation would be conducted in coordination with VANR (e.g. compensatory deer wintering habitat mitigation, creation of wood frog habitat).

ES-11 Hazardous Materials

Under the No Build Alternative, occasional spills of hazardous materials could occur. In addition, hazardous materials could be encountered during future development in the project area.

The VT 2A corridor has been developed since the mid-1800s and possibly earlier. Construction activities along this corridor as part of the VT 2A and Hybrid Alternatives would likely encounter hazardous materials, which would vary slightly depending on the alternative. Parcels along the corridor with documented or suspected contamination are distributed throughout the corridor, with higher concentrations of such parcels located between the Winooski River and Five Corners.

Under the Circ A/B and Hybrid Alternatives, there is the potential to encounter hazardous materials where the Circ A/B corridor crosses US 2. The Circ A/B Alternatives could also encounter soil and groundwater contamination at the Chittenden Solid Waste District facility at the north end of the corridor.

Depending on the Preferred Alternative selected for construction, further investigation and sampling/testing should be conducted in potentially affected known contaminated areas to obtain sufficient information to characterize the type and extent of contamination. Subsurface investigation would likely include soil borings, test pits and groundwater monitoring. Above-grade investigations would include Phase I Environmental Site Assessments and Phase II assessments, which would include sampling and laboratory analyses of building materials. If contamination in these areas is confirmed, contamination management measures would be incorporated into the project's construction practices and would prevent contamination from affecting the health of workers, the public and the surrounding environment.

More detailed information is provided in Chapter 12.0: Hazardous and Contaminated Materials Associated with the Evaluated Alternatives and Chapter 16: Construction Impacts Associated with the Evaluated Alternatives.

ES-12 Visual Resources

Under the No Build Alternative, minor changes to VT 2A would occur. These changes would not impact the visual character of the VT 2A corridor.

The VT 2A and Hybrid Alternatives would alter the visual character of established residential neighborhoods along VT 2A. 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 a roundabout at Five Corners.

The Circ A/B Alternatives and the Circ Street would alter the existing natural viewshed in the Circ A/B corridor, which consists of rolling hills, open and forested land. The Hybrid Alternatives would have a lesser impact on visual character because they do not involve construction beyond Mountain View Road or a new bridge over the Winooski River.

More detailed information is provided in Chapter 13.0: Effects of the Evaluated Alternatives on Visual Resources.

ES-13 Infrastructure and Utilities

Under the No Build Alternative, minor utility disruptions would occur as part of ongoing maintenance to support future residential and business growth along VT 2A.

In the VT 2A corridor, the VT 2A and Hybrid Alternatives would require utility relocations affecting water supply, sewer, natural gas, electrical, and telephone and cable utilities.

In the Circ A/B corridor, the Circ A/B Alternatives and the Circ Street portion of the Hybrid Alternatives would require minimal utility relocations, primarily where the corridor is crossed by US 2 and Mountain View Road.

More detailed information is provided in Chapter 14.0: Effects of the Evaluated Alternatives on Infrastructure and Utilities.

ES-14 Energy

The Build Alternatives would result in negligible changes in average daily peak hour fuel consumption in Chittenden County compared to the No Build Alternative. More detailed information is provided in Chapter 15.0: Effects of the Evaluated Alternatives on Energy Consumption.

ES-15 Construction

Including differences in estimated design and permitting costs, the VT 2A Alternatives would cost \$50.9 to \$68.3 million (in 2007 dollars), while the Circ A/B alternatives would cost \$62.8 to \$89.1 million, and the Hybrid alternatives would cost \$68.1 to \$90.1 million.

It is anticipated that there would be substantial differences in the time that would be required for the project development (design and permitting) of the various alternatives. The layout, profile

and structure design of Alternative 16a has been carried through final design and permitting as part of the CCCH project, and does not require any additional right-of-way acquisition. Construction of Alternative 16a could begin sooner than the other alternatives, requiring minor redesign, and updating of existing permits. Alternatives 16b, 16c and 17 would require some additional design, relatively few right-of-way transactions, and possibly could be constructed with modifications to existing permits. The VT 2A and Hybrid Alternatives would take substantially longer for construction to begin because of the need to complete preliminary and final design, right-of-way acquisition and the permitting process. It is anticipated that the duration of construction of any of the Build Alternatives would be approximately three years.

The construction of the Build Alternatives would result in temporary economic benefits to the Northwest Vermont Region.

The Build Alternatives would result in some temporary construction period impacts to air quality, noise, vegetation, wetlands, water resources, and hazardous materials. These impacts would be minimized through the use of standard construction best management practices and compliance with applicable permit requirements (e.g. NPDES construction stormwater permit).

More detailed information is provided in Chapter 16.0: Construction Impacts Resulting from the Evaluated Alternatives.

ES-16 Indirect Effects and Cumulative Impacts

Chittenden County and the northwest Vermont region are expected to experience continued growth and land development. Levels of growth anticipated for the future are largely consistent with past rates of growth. Development activity is expected to result in the intensification of existing urban, suburban and village centers, and expansion of the suburban core and fringe to areas that are currently more rural in character. The level of anticipated development is likely to change some areas substantially, while leaving the landscape in other areas relatively unchanged. The direct and indirect effects of the Build Alternatives are not likely to alter these established trends.

Growth and development are expected to result in some cumulative impacts to agricultural lands, habitat areas, water quality, vegetation and forestland, social conditions, cultural resources, and visual resources. Some of these potential impacts will be moderated through review according to state environmental and development regulations. Other impacts can be avoided or minimized through municipal planning efforts, land use and zoning controls, subdivision requirements, design standards, taxation policies, and local roadway access management.

More detailed information is provided in Chapter 17.0: Indirect Effects and Cumulative Impacts of the Evaluated Alternatives.

ES-17 Federal, State and Local Actions Required

The proposed project requires a number of permits and approvals. Depending on the alternative, the following state and federal permits may be required.

ES-17.1 Federal

- U.S. Army Corps of Engineers Section 404 Individual Permit

ES-17.2 State of Vermont

- Act 250 Permit
- Compliance with Vermont Wetland Rules
- Section 401 Water Quality Certification
- National Pollutant Discharge Elimination System (NPDES) permit for construction stormwater runoff.
- NPDES for operational-phase stormwater runoff