

2.0 PURPOSE AND NEED FOR THE PROPOSED PROJECT

2.1 Introduction and Background

Chittenden County, including the project area municipalities (Williston, Essex and Essex Junction), has experienced a period of rapid population and employment growth, with corresponding traffic growth, for over three decades and is expected to continue to grow for several decades into the future. As population and employment have grown in the project area, there have been an increasing number of trips between the communities for home-to-work, home-to-shopping, and business-to-business. These trips are primarily north-south oriented wherein, historically, the predominant trip direction, and major roadway orientation through the project area, was east-west to serve travel to the traditional employment, shopping, and business core of Chittenden County – Burlington, South Burlington, and Winooski. Other than localized improvements and the construction of VT 289 in Essex, the transportation network has remained relatively unchanged in the project area during this time. In the absence of a transportation improvement in Williston in the project area between I-89 and Essex and Essex Junction, traffic volumes on north-south roadway segments have increased. Specifically, VT 2A between I-89 Exit 12 in Williston and the Five Corners intersection in Essex Junction is the arterial roadway connecting these communities and, as a result, VT 2A has experienced increased use. As travel on VT 2A has increased, a portion of traffic has diverted to North Williston Road between US 2 and VT 117, a rural town road.

As a result of the underlying factors described in the preceding paragraph, and as described in detail in Section 2.4, the Circ-Williston project area exhibits many transportation system deficiencies, particularly on portions of north-south oriented roadways including the following:

- 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.

These conditions, described in greater detail in Section 2.4, are expected to worsen in the future as the County and the project area continue to experience population and employment growth. The proposed transportation improvements in the Circ-Williston project area are intended to address these conditions.

2.2 Summary of Need

VT 2A is the north-south spine of the project area connecting three of the four major highways leading into Burlington and South Burlington (I-89, US 2 and VT 15). VT 2A between Exit 12 and US 2, and US 2 between VT 2A and Exit 14 are part of the National Highway System. VT 2A directly serves the growing Taft Corners area, a regional retail destination, as well as the established village center of Essex Junction. VT 2A is a funnel for traffic crossing the Winooski River to Essex Junction and points beyond; the only other public road crossing the river in the project area connecting Williston and Essex is North Williston Road, a north-south town road traversing a rural portion of the

project area which is on varying terrain, and subject to frequent flooding and closure. During the PM peak hour, through-traffic traveling on VT 2A ranges from 34 to 50 percent of total traffic, with the highest percentage north of Industrial Avenue. There is a need to address the component of through travel as it contributes to congestion and crashes in the project area. In addition, there is a need to improve travel conditions in the project area to meet the need to efficiently move people and goods between Williston and Essex and Essex Junction and to improve overall travel safety. Meanwhile, there is a need to address increasing truck traffic on local roadways, an element of vehicles using local roadways for through travel, as such traffic negatively affects quality of life of residents in the vicinity of such roadways.

2.3 Purpose of the Proposed Action

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).

2.4 Need for the Proposed Action

Transportation deficiencies in the project area and, specifically, on VT 2A and North Williston Road have been identified in other studies as well as being described more fully below. These deficiencies include: 1) traffic congestion between I-89 and Essex and Essex Junction; 2) a combination of relatively high traffic volumes and inadequate roadway design features which contribute to conflicting traffic movements and safety issues for all modes of travel, including vehicular, pedestrian and bicycle; and 3) mobility issues between business centers, which affect commerce and the efficient movement of people and goods. In the absence of transportation improvements, these deficiencies will worsen in the future as population and employment grow, and traffic volumes increase. These deficiencies are described in greater detail in the following sections, and in Chapter 5: Traffic and Transportation.

2.4.1 Traffic Congestion

Population and employment in the project area have grown rapidly in the past three decades. This growth has led to corresponding increases in automobile and truck travel to, from, within, and through the project area, resulting in increased traffic congestion in the project area. The project area municipalities (Williston, Essex, and Essex Junction) are all included within the area defined by the CCRPC as the County's urban core (along with Burlington, Colchester, Shelburne, South Burlington, and Winooski). In addition, according to the CCRPC's *2006 Regional Plan and Planning Areas* map of Chittenden County, much of the project area is designated either as Metropolitan (including the area centered on VT 2A between I-89 Exit 12 and Taft Corners and Five Corners in Essex Junction), Enterprise, or Transition (between Rural and Metropolitan). The demographic trends underlying recent and future traffic volume growth in the project area are described below.

Population

The population of Chittenden County has grown steadily over the last thirty years from 99,000 in 1970 to 147,000 in 2000, a compound average growth of 1.3 percent per year. Population has been dispersing beyond the traditional urban core of Burlington, South

Burlington, and Winooski. Williston posted the largest percentage gain in population between 1990 and 2000, growing from 4,900 to 7,700 residents, a gain of 57 percent. Essex and Essex Junction grew by 13 percent during this period.

Over the next two decades, the CCRPC is expecting further growth to a total estimated population of 190,000 in 2030, 43,000 more residents than 2000. This is estimated to result in the addition of over 29,000 households in Chittenden County over this period from 60,333 in 2000 to 89,455 in 2030. Nearly 7,200 new households are expected to be added to the three project area municipalities. These municipalities will increase their overall share of total housing in Chittenden County over this period from 17.2 to 19.6 percent of households as they will capture a larger share of new households as compared with the County as a whole.

Employment¹

The increase in employment was one of the key drivers of population growth in Chittenden County in the last half of the 20th century. Total employment in the County grew from 50,000 in 1970 to 120,000 in 2000, an increase of 140 percent or three percent per year. Key growth sectors were services (increase of 30,000 jobs or 4.0 percent per year); finance, insurance and real estate (increase of 5,000 jobs or 3.7 percent year); and retail (increase of 12,000 jobs or 3.3 percent per year).

Over the last thirty years, employment has grown at twice the rate of population growth. In 2000, the total number of jobs in Chittenden County exceeded the labor force by thirty-four percent, solidifying Chittenden County's position as an employment center for residents in other areas of Northwest Vermont within commuting distance. Overall, Chittenden County accounts for more than thirty percent of the jobs in the State of Vermont.

As with population, employment has been dispersing from the traditional urban core. Employment in Williston more than doubled between 1990 and 2000, from 4,600 to 9,700 jobs, a compound annual growth rate of nearly eight percent per year. Most of the growth was in the retail and service sectors. Williston accounted for ten percent of County-covered employment in 2000, up from six percent in 1990. Essex and Essex Junction, already established as a major employment center in the County in 1990, grew at a rate of nearly two percent per year or 2,400 jobs during this same period.

Over the next three decades, CCRPC estimates that Chittenden County will add 48,515 jobs, for an increase of thirty-nine percent. As in the past, most of the new jobs are expected to be in the service and retail sectors, with demand for construction expected to be high to meet the needs for housing and commercial/industrial growth. Williston, Essex, and Essex Junction are expected to gain jobs, increasing by an estimated 54.3 percent by 2030, and growing their share of County's total employment from 27.1 to 30.1 percent.

¹Sources: U.S. Bureau of Economic Analysis Regional Economic Information System, total full and part-time employment by industry; Vermont Department of Labor and Industry, covered employment; U.S. Bureau of Transportation Statistics, Census Transportation Planning Package, 2000; CCRPC/CCMPO *Economic and Demographic Forecast 2000-2035*, September 2000.

Journey to Work²

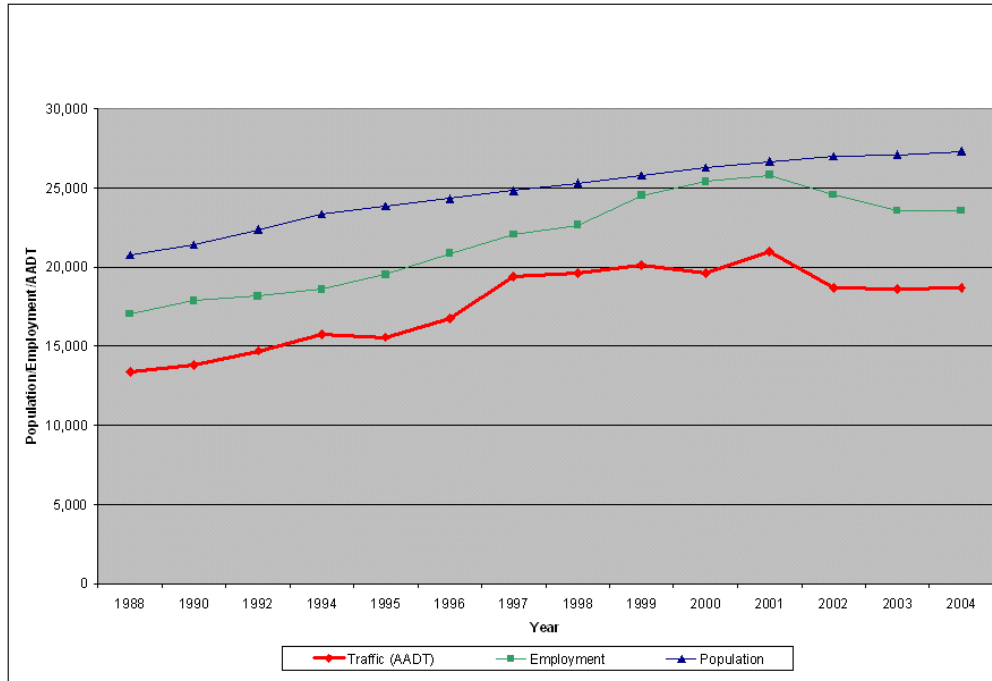
Commutes to work are becoming more dispersed as jobs have moved from Burlington to other towns in the employment core of Chittenden County, including those in the project area. This trend has resulted in increased traffic volumes on routes that carry suburb-to-suburb traffic. In addition, the portion of work trips in the project area that are through trips is increasing. Specifically in the project area, the number of residents commuting to Essex and Essex Junction from other locations in Chittenden County increased approximately eleven percent between 1990 and 2000. With a sharp increase in the number of jobs available in Williston, the number of Chittenden County residents outside of Williston commuting to jobs there doubled between 1990 and 2000 from about 3,000 to about 6,100. The number of Essex residents commuting to Williston also doubled over the same period, from 540 to 1,100, amounting to ten percent of the Essex Town workforce, up from five percent in 1990. In addition, approximately twenty-five percent of Williston jobs are held by workers who reside outside of Chittenden County, as compared with eighteen percent in 1990. Further detailed information is provided in Section 7.2: Demographics, Economics and Housing.

Based on the relationship between growth in vehicle miles traveled (VMT) and total employment in Chittenden County observed from 1986 through 2000, every job added to total employment produces an additional 8,350 in annual VMT countywide. Figure 2.4-1 illustrates the relationship between changes in population and employment in the project area and changes in traffic volumes on a specific roadway segment in the project area, VT 2A between I-89 and Marshall Avenue in Williston (where traffic volumes have grown over thirty-five percent since 1990). In particular, the data show a strong correlation between employment and traffic volumes. While the correlation between jobs and AADT does not distinguish between trip purposes (AADT includes trip to work and trips to retail and service establishments that are large employers and destinations for shopping trips), for every job added, annual average daily traffic (AADT) has increased by 0.95 vehicles per day at this location.³

² U.S. Bureau of Transportation Statistics, Census Transportation Planning Package, 1990, 2000.

³Total Employment-AADT, OLS analysis significant at 95 percent confidence level, R²: 0.950.

Figure 2.4-1
Average Annual Daily Traffic and Population/Employment in Essex Junction, and
Williston, 1988-2004, Vt Route 2A, South of Marshall Avenue (I-89 Exit 12)



Source: The Louis Berger Group, Inc., 2006. AADT from Chittenden County Metropolitan Planning Organization; Population estimates from Vermont Indicators Online (www.vcgi.org); Employment estimates from Vermont Department of Labor, Covered Employment & Wages (QCEW).

Roadway Congestion

As a result of the growth factors described above, traffic congestion is evident along the project corridor and in the communities it serves, particularly during morning and evening peak hours. Several studies have examined roadway operating conditions in the project area in the past eight years. Among these studies are the *Vermont 2A Corridor Study* (Town of Williston, 2003); *Interstate 89 Ramp Safety Improvements Project Exit 12 (Southbound) Initial Scoping Report* (VTrans, 2005); *VT Route 15 Modeling of Existing Conditions and Optimized Signal Operations* (CCMPO, 2004); *Williston Intersections Project Definition Report* (CCMPO, 2002); *Williston Comprehensive Transportation Study* (Town of Williston, 2003); *VT 15 Corridor Study* (CCMPO, 2008); *US2/North Williston Road/Oak Hill Road Scoping Study* (CCMPO, 2009); *VT Route 15 / Educational Drive Scoping Study* (CCMPO, 2006); *US 2 Corridor Transportation Management Plan* (CCMPO, 2007); *VT 2A – James Brown Drive Scoping Study* (CCMPO, 2009); and the *Transportation Technical Report* prepared as part of this Environmental Impact Statement. The attention to these locations in recent years is an indication that there are multiple problem sites within the project area. Following is a description of existing and projected roadway congestion conditions from these studies.

Level of Service (LOS) is the measure used to define how a transportation intersection operates and how congested it is. For signalized intersections, LOS A describes operations with minimal delays (up to ten seconds per vehicle), while LOS F describes

operations with delays in excess of eighty seconds per vehicle. Under LOS F, excessive delays and longer queues are common as a result of over-saturated conditions (i.e., travel demand exceeds the capacity). According to the *Highway Capacity Manual* (Transportation Research Board, 2000), delays experienced at LOS A, B, C or mid-D (below forty-five seconds per vehicle) are generally considered “acceptable” operating conditions. LOS E and F are generally considered “unacceptable” operating conditions. VTrans LOS policy is to design facilities that maintain LOS C; however reduced LOS is acceptable on a case-by-case basis in densely settled areas, such as the project area (VTrans, 2007).

The *Transportation Technical Report* (DEIS Appendix O) indicates that LOS F conditions, i.e., substandard traffic flow conditions indicative of operational deficiencies, currently occur during the AM and/or PM peak hour at four of the 14 intersections on VT 2A between I-89 Exit 12 in Williston and Five Corners in Essex Junction., a distance of 3.5 miles. By 2030, seven of the fourteen intersections will operate at LOS F during both the AM and PM peak hour. Operating conditions at Five Corners, one of the intersections with LOS F conditions during both peak hours in 2030, are further exacerbated when a train crosses any of three of the five approach roads to Five Corners; when this happens, traffic can spill back into Williston.

Congested conditions are expected to worsen in the future as congestion evolves from operational problems at intersections into congestion problems for entire roadway segments. By 2030, it is estimated that the following VT 2A roadway segments between intersections will experience congestion where traffic volumes will exceed roadway capacity: during the AM peak hour, southbound VT 2A between Five Corners and Industrial Avenue/Mountain View Road (a distance of 1.8 miles) and northbound VT 2A between I-89 Exit 12 and Taft Corners; and during the PM peak hour, northbound VT 2A between Taft Corners and Five Corners (a distance of 0.7 miles), southbound VT 2A between South Street/River Road and Industrial Avenue/Mountain View Road. Congested PM peak hour conditions in both directions of VT 2A north of Industrial Avenue/Mountain View Road indicates that left turning vehicles to driveways and unsignalized intersections will find few gaps in oncoming traffic of sufficient length to permit the turn, and will cause back-ups until the turn can be made.



Photo 1: PM Traffic at the VT 15 and Five Corners Intersection (Level of Service F)

Because of these congested conditions on VT 2A, the principal north-south arterial between Williston and Essex and Essex Junction, many drivers will seek other, parallel routes. The nearest alternate route to VT 2A in the project area is North Williston Road. North Williston Road, an urban collector route, is expected to experience conditions where volumes are twenty-five percent greater than capacity by 2030 in the southbound (AM peak) and northbound (PM peak) directions between Mountain View Road and VT 117, an area in an Agricultural/Rural Residential zoning district. Intersections along North Williston Road are also expected to experience unacceptable levels of service (further detailed information is provided in Chapter 5: Traffic and Transportation).

2.4.2 Inadequate Roadway Design and Safety Issues

Where there is a combination of traffic volumes exceeding capacities and a high potential for conflicts between through and turning movements, high crash frequencies can occur. These conditions are compounded at locations with inadequate/outdated roadway design, including poor roadway geometry, poor signal timing, at-grade rail crossings, or heavy pedestrian crossings (or some combination of these factors). According to the 2025 Metropolitan Transportation Plan, arterial roadways in Chittenden County carry about sixty-seven percent of all vehicle miles traveled. Arterial roadways in the project area include US 2, VT 15, VT 117, and VT 2A. These facilities serve the multiple functions of: distributing trips to local roads and streets; providing access to abutting properties; carrying a large proportion of regional or through trips as described in the previous section; and carrying substantial truck/freight traffic. Except for US 2, all of these roadways converge on Five Corners in Essex Junction. Over time, these roadways have experienced the combination of growing traffic volumes, congestion, and increased numbers of curb cut entries and exits for local collector streets, driveways, and other access points to developing land adjacent to and near the arterials which has led to increasing crash frequencies.

The VTrans methodology for identifying high crash locations compares the crash rate on a roadway segment over a five-year period (measured as crashes per million vehicle miles) with the statewide rate for roadways of a similar classification. The actual current crash rates computed for the VT 2A segments (a sliding 0.3-mile section at 0.1-mile increments along VT 2A) were compared with the statewide crash rates to determine the relative severity of crash occurrences at the locations. Based on 2003-2007 data, a total of seventeen segments of VT 2A in Williston and twelve segments in Essex Junction experience crash rates higher than the statewide average crash rate for such segments. In addition, all but one of these segments has also experienced five or more crashes over the five-year reporting period. Based on the two criteria used to define a High Crash Location, eleven segments of VT 2A in Williston and nine in Essex Junction are defined as High Crash Locations. Three segments of North Williston Road in the vicinity of the Mountain View Road intersection also have crash rates higher than the statewide average crash rate.

The annual number of crashes on VT 2A is estimated to grow by twenty percent between 2005 and 2030, from 147 to 176 crashes. The total number of crashes on all major project area roadways (including VT 2A) is projected to increase by about fifteen percent between 2005 and 2030, from 495 to 569 crashes based on the increase in traffic volumes alone. The increase in crashes could be even higher considering the projected increases in traffic congestion in the project area. For example, a safety problem can be created when driver frustration with excessive delays on a side street contributes to drivers selecting smaller than adequate traffic gaps to turn onto the main road. Side street delays are a substantial problem on VT 2A, as evidenced by the James Brown Drive Scoping Study. Williston's preferred solution from the James Brown Drive study would involve a two-way left-turn lane on VT 2A and a signalized intersection at James Brown Drive.

VTrans's report *General Yearly Summaries-Crash List for State Highways and All Federal-Aid Highway Systems (01/01/04 To 12/31/08)* provides information on the number and type of crashes occurring on VT 2A in Williston and Essex Junction. Over

the five year reporting period, 56 percent of the crashes in Williston were classified as rear-end type crashes. In Essex Junction, 41 percent of crashes were classified as rear-end type crashes. The second most common type of crashes on VT 2A were left-turn crashes (14 percent of crashes in Williston and 22 percent of crashes in Essex Junction). The relatively high percentage of rear-end and angle type crashes is indicative of the high amount of crashes involving turning vehicles into or from the numerous driveways and streets that line VT 2A.

During the PM peak hour, through-traffic traveling on VT 2A ranges from thirty-four to fifty percent of total traffic, depending on the segment, with the highest percentage of through-traffic between Industrial Avenue in Williston and Five Corners in Essex Junction. This relatively high volume of through-traffic, combined with the relatively high number of unsignalized turning movements off-of and on-to VT 2A, particularly between US 2 and Essex Junction, contributes to the unacceptable operating conditions and the relatively high proportion of accidents involving rear and angle-type crashes.

2.4.3 Movement of People and Goods

VT 2A provides a route for direct or intermediate access to a relatively high concentration of intermodal, commercial, industrial, and retail centers in and nearby the project area. Many of these centers are of regional and, in certain cases, statewide importance. Among these centers are IBM in Essex Junction and Williston (one of the largest private employers in Vermont); the Taft Corners area of Williston (a regional retail destination); Burlington International Airport in South Burlington accessed off I-89 Exit 12 in Williston (the only such facility in the state); and the Champlain Valley Exposition Fairgrounds in Essex Junction (which attracts more than 350,000 visitors annually). Figure 2.4-2 illustrates the locations of these business centers in relation to the VT 2A and Circ A/B corridors. Many ancillary business establishments supporting these centers, e.g., air cargo establishments, are also located in the project area, with proximity to the centers being an important business location consideration. Indeed, VT 2A links the designated Metropolitan planning areas between I-89 Exit 12-Taft Corners and Five Corners, and the designated Enterprise planning areas centered on Brownell Road in Williston, Redmond Road in Williston, and VT 117 in Essex Junction.

When congestion occurs on arterials serving these centers, including VT 2A, employees, employers, and shippers experience travel time delays, i.e., the movement of people and goods to and from these economic centers is impeded creating inefficiencies and adding to the cost of doing business. By 2030, the following VT 2A intersections vital to the accessibility of project area business centers would operate at unacceptable levels of congestion:

- *VT 2A and Marshall Avenue/Maple Tree Place*- access to regional shopping center and other commercial areas (LOS F in PM peak).
- *VT 2A and Industrial Avenue/Mountain View Road*- access to commercial and industrial areas west of VT 2A (LOS F- in AM and PM peak).
- *VT 2A and South Street/River Street*- access to IBM (LOS F- in AM peak).
- *VT 2A and Five Corners*- access to Essex Junction businesses and Champlain Valley Expo (LOS F- in AM peak, LOS F in PM peak)

The transportation model used to forecast traffic volumes analyzed in this FEIS was also used to calculate the typical vehicle (weighted average) travel time for trips originating in Williston and destined for Essex or Essex Junction and vice versa during the weekday AM and PM peak hours for both 2005 and 2030 conditions. During the AM peak hour, the typical Essex Junction-to-Williston trip is projected to increase by 30 percent from 12.6 minutes to fifteen minutes between 2005 and 2030, while the typical Essex-to-Williston trip is projected to increase by twenty-one percent, from 18.3 minutes to twenty-two minutes. During the PM peak hour, the typical Williston-to-Essex Junction trip is projected to increase by 42.2 percent, from 14.5 minutes to 20.7 minutes, while the typical Williston-to-Essex trip is projected to increase by 27.5 percent from 20.8 minutes to 26.6 minutes.

Accommodation of Truck Traffic

During scoping, public concerns were raised regarding the adverse effects of truck traffic on the suburban and rural character of the project area. Safety and environmental concerns were raised with heavy truck movements on roads that may have inadequate design features to accommodate such movements. As a result, truck traffic issues were included in the DEIS Purpose and Need Statement (DEIS Section 2.4.4) and an analysis of truck traffic on local roads was used as a transportation performance measure. However, the available truck traffic data, and the comments of other agencies (including EPA) have led to the decision to not use the reduction of truck traffic on local roads as a performance measure to determine whether or not an alternative meets the purpose and need. In comments on the DEIS, EPA points out that reducing truck traffic on local roads is not part of the basic project purpose approved by the U.S. Army Corps of Engineers. Nonetheless, the increase or decrease in truck traffic was considered when assessing community impacts and was taken into account in selecting the Preferred Alternative. The basic project purpose 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)." The FEIS uses a mobility measure (weighted average travel times) as an indicator for the "accommodation of goods", including truck traffic. Safety issues related to traffic volumes on secondary roads, such as North Williston Road, are qualitatively assessed in the safety portion of the traffic and transportation analysis (See Chapter 5).