Shelburne, Vermont

US Route 7/Harbor Road/Falls Road
Scoping Report

May 30, 2014

CHITTENDEN COUNTY REGIONAL PLANNING COMMISSION

TOWN OF SHELBURNE

CHITTENDEN COUNTY RPC

VERMONT AGENCY OF TRANSPORTATION

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This study is the result of the support and strong interest of the Project Committee Members and great interest and input from a series of stakeholder meetings. The study's quality and success is due to their contributions.

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1.0 Introduction

The Town of Shelburne obtained transportation planning assistance from the Chittenden County Regional Planning Commission (CCRPC) to complete a scoping process for alternatives to improve the area around the intersection of US Route 7 / Harbor Road / Falls Road. Stantec Consulting Services Inc. was contracted by the CCRPC to develop this scoping report. The scoping process includes working with a project committee, soliciting public input, establishing the project purpose and needs, evaluating alternatives, and seeking endorsement of a preferred alternative. The project committee consists of:

Paul Bohne – Town of Shelburne
Dean Pierce – Town of Shelburne
John Zicconi, Town of Shelburne
Jason Charest – Chittenden County Regional Planning Commission
Spencer Palmer – Vermont Agency of Transportation (VTrans)
Derek Lyman – Vermont Agency of Transportation (VTrans)
Greg Edwards – Stantec Consulting Services Inc.
Rick Bryant – Stantec Consulting Services Inc.

The project area consists of an approximately 1,500-foot long section of US Route 7, beginning at the US Route 7 / Church Street intersection and extending northward to the Episcopal Church. The Harbor Road approach to US Route 7 is also included, as is the Falls Road approach to Route 7. The Falls Road / Church Street intersection is a secondary area that is anticipated to be evaluated for impacts due to some of the evaluated alternatives.

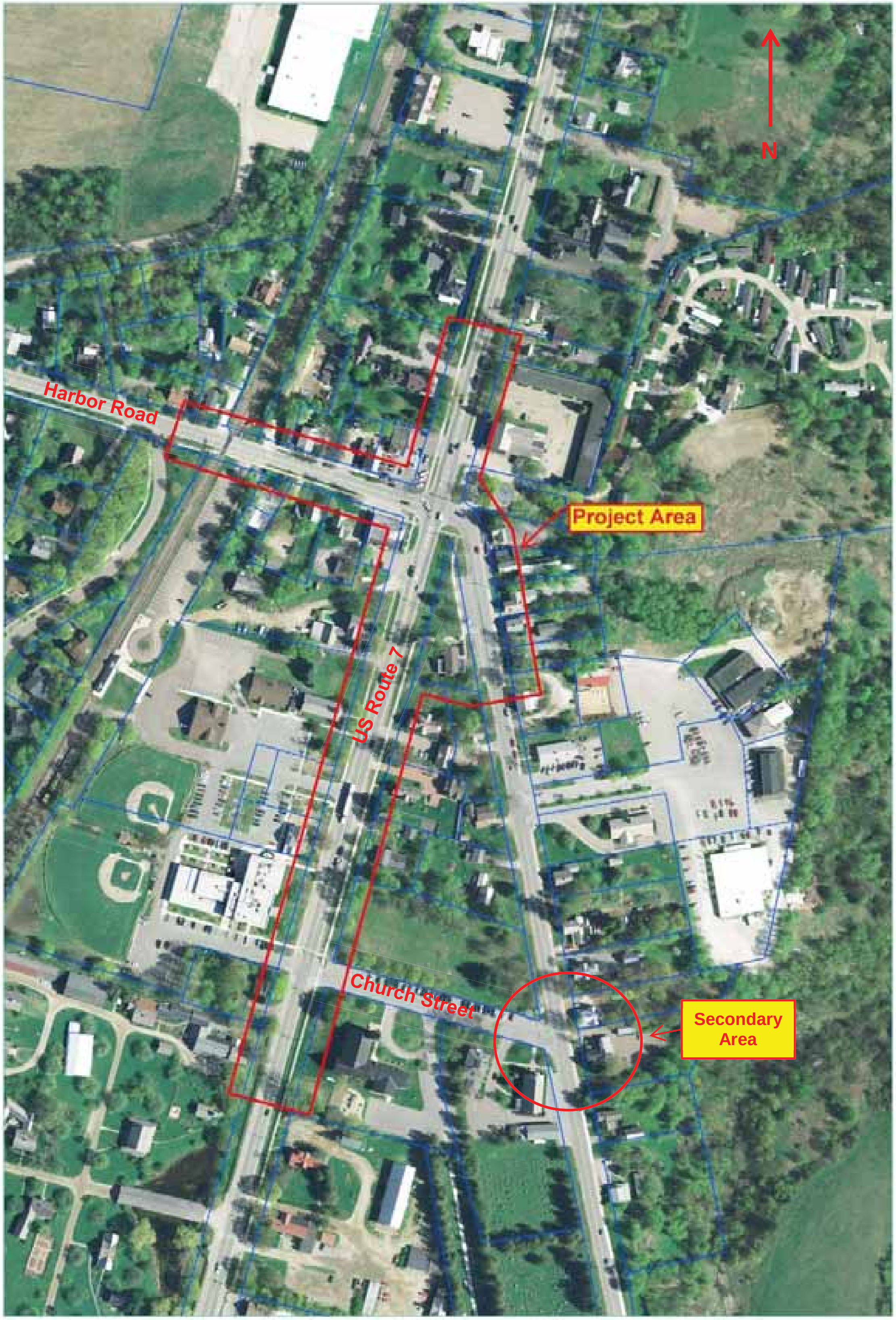


Figure 1: Project Study Area

2.0 Project Background

Several studies and plans have been developed that considered traffic and pedestrian issues at the US Route 7 / Falls Road / Harbor Road intersection, and addressed the impacts of proposed developments and village growth.

The following have been reviewed:

- Shelburne Comprehensive Plan 2012
- Shelburne Village Traffic Circulation Alternatives Analysis (July 14, 2006)
- Update of the Shelburne Village Plan (June, 2006)
- Harrington Village Traffic Impact Study (July 8, 2011)
- Shelburne Green Traffic Impact Assessment (April 7, 2011)
- Harbor Road Technical Evaluation Report (June 2011)
- US Route 7 / Marsett Road / Bostwick Road Intersection Safety Analysis (February 2011)
- Shelburne Village Transportation Plan (December 2000)
- Conceptual Site Plan Shelburne Road / Harbor Road / Falls Road Intersection (CEA, May 2005)

Town efforts currently underway to recognize and coordinate with include:

- Shelburne Parade Ground and Village Green landscape Master Plan
- A map of Built Environment Significant Views

2.1 Existing Plan and Study Review

The Shelburne Comprehensive Plan 2012[1] contains the Town's vision, goals, objectives and recommended actions. Plan items of pertinent importance to consider for this project include:

1. Reinforce the Village Center area around the Shelburne Road / Falls Road / Harbor Road intersection as the commercial, civic and social center of the community.
2. Enhance Shelburne Road as the "Grand Avenue" of the village by maintaining the visual qualities and residential character of development

[1] The 2012 Plan was replaced by a substantially similar 2014 Plan after the study summarized in this report was completed.

along it. Shelburne Road shall remain two lanes as it passes through the village area.

3. Encourage a variety of appropriately scaled commercial, residential, and mixed use development and redevelopment in the village.
4. Encourage continued private investment in the village through thoughtful and timely public investments in infrastructure (streets, Parking Utilities, etc.) and amenities (landscaping, streetscape, streetlights, etc.)
5. Maintain and enhance pedestrian accessibility in and to the village.
6. Street intersections shall contain marked crosswalks at all sidewalk crossings. Signalized intersections shall contain pedestrian activated walk phases.
7. Create attractive and clearly identifiable entrances to the village.
8. Refine and reorganize the triangular Village Green as a visual focal point for the village.
9. Reinforce the Parade Ground north of Church Street as an active open space in the village.
10. Link the cluster of town buildings on the west side of Shelburne Road to the rest of the village by pedestrian ways, visual features such as landscaping, streetlight design, and signage.

Many of the concepts and recommendations of the "Update of the Shelburne Village Plan" (June 2006) are incorporated in the Shelburne Comprehensive Plan 2012 as noted above. This plan includes specific improvements and details on making the village more pedestrian friendly and adding definition to the village core. The overall concept provided for US Route 7 is to create a "boulevard" character by rows of stately trees, and better defining of the roadway and pedestrian zones with addition of curbs, wide sidewalks, and street trees. A central splitter island with trees is recommended for the north and south gateways. Falls Road, between US Route 7 and Church Street, is described in the plan as a prominent shopping street and "heart" of Shelburne Village. The plan indicates, "The emphasis here is to create a slow shopping street that is comfortable for pedestrians." Proposed improvements for this section of Falls Road includes sidewalks on both sides, street trees, expand on-street parking, decorative street lighting and 10' travel lanes. Similar improvements were included for Harbor Road and Church Streets.

The Shelburne Village Traffic Circulation Alternatives Analysis (July 14, 2006) evaluated alternatives to improve the area around the intersection of US Route 7 / Harbor Road / Falls Road. The primary goal was to improve vehicular and pedestrian mobility. Alternatives analyzed included: 1) construct modern roundabout; 2) create one way southbound traffic flow on Falls Road; 3) widen Harbor Road approach, implement split signal phasing; 4) eliminate left turns on US Route 7 with Church Street / Falls Road jug handle. The traffic analysis indicated little traffic performance improvements for the split phase and jug handle alternatives. The Falls Road one-way provided some improvements and the roundabout the most improvement. The analysis concluded a decision on the loop road concept, linking the proposed Harrington Development with the Shelburne Shopping Plaza, was needed to indicate which alternatives should be considered.

3.0 Existing Conditions

3.1 Roadway Characteristics

The project study area is located entirely within Shelburne's historic village center. It includes the triangle created by: US Route 7 from Falls Road to Church Street; Church Street between US Route 7 and Falls Road; and, Falls Road between Church Street and US Route 7. The project study area is shown in Figure 1 found in Section 1.0. Existing roadway conditions in the study area are described below.

3.1.1 US Route 7

US Route 7 is a state owned and maintained principal arterial. It functions as the primary north-south travel corridor for much of western Vermont. In the immediate project area it serves as the most direct route between Burlington and Shelburne, as well as between Burlington and the municipalities directly south of Shelburne. Just north and south of the project area it provides one travel lane with paved shoulders in each direction. The pavement width is 28 feet north of Falls Road and 34 feet south of Falls Road. At its intersection with Falls Road the shoulder narrows as a dedicated left-turn lane is provided in each direction. At Church Street a two-lane section is maintained. However, the west side paved shoulder near Church Street, a former school bus drop-off zone, is ten feet wide. The posted speed limit in this area is 35 miles per hour. No parking is allowed on this section of US Route 7. Sidewalks are generally provided on both sides of US Route 7 in the project area separated from the traveled way by a green belt. South of Church Street there is only a sidewalk on the east side of the roadway. The VTrans Route Log indicates US Route 7 in the area was constructed with concrete pavement in 1927. A major resurfacing project was carried out in 2012 and 2013. As a result of the resurfacing project, the area now features 4-foot paved shoulders and 11-foot travel lanes. The horizontal and vertical alignment of US Route 7 is relatively straight and level.

3.1.2 Harbor Road

Harbor Road meets US Route 7 from the west opposite Falls Road and is a Town owned and maintained major collector. It provides access to Shelburne Farms and Shelburne Point areas and, notably, to two schools: Shelburne Community School and Lake Champlain Waldorf School. It is a two-lane, two-way roadway approximately 30 feet wide with sidewalks on both sides in the vicinity of US Route 7. A green belt separates the sidewalk from the traveled way except on the south side of the roadway at US Route 7. At this location the south side sidewalk shifts south and runs along the side of a commercial building. The commercial building has approximately seven 90-degree parking spaces on Harbor Road that separate the sidewalk from the roadway. This parking is close to the intersection, and entering and exiting vehicles conflict with queued vehicles on the Harbor Road approach to

US Route 7. Otherwise there is no parking allowed along Harbor Road. The posted speed limit in this area is 25 miles per hour.

3.1.3 Falls Road

Falls Road is a Town owned and maintained local road. It provides access to businesses and residents in the village center including the Shelburne Shopping Park. (The Shopping Park driveway is located approximately 600 feet south of Route 7 and 400 feet north of Church Street on the east side of Falls Road.) Falls Road also provides access to US Route 7 for neighborhoods located southeast of the village center. It provides one travel lane with narrow paved shoulders in each direction. A sidewalk is provided along the east side of the roadway immediately adjacent to the traveled way except in the vicinity of its intersection with US Route 7. In this area, 90-degree parking serving retail uses on the east side of the roadway interrupts the sidewalk. A painted crosswalk is provided just south of this area allowing pedestrians to cross to the west side of the road where there is a sidewalk bringing pedestrians to the US Route 7 intersection. This sidewalk is located west of 90-degree parking that is also provided on the west side of the roadway (approximately 10 spaces). Another 4 spaces of parallel parking are available to the south of crosswalk. The posted speed limit in this area is 30 miles per hour.

3.1.4 Church Street

Church Street is an east-west roadway that connects Falls Road and US Route 7. It forms the southern boundary of the Village Green / Parade Ground area and intersects US Route 7 approximately 900 feet south of the signalized intersection of US Route 7 / Harbor Road / Falls Road. Church Street is a two-lane, two-way local street with a straight alignment between US Route 7 and Falls Road. Ninety-degree parking is provided along the north side of the street for its entire length (approximately 450 feet). A sidewalk is provided along the south side of the street separated from the traveled way by a green belt. There is no speed limit posted on this roadway section.

3.2 Intersection Characteristics

3.2.1 US Route 7 / Harbor Road / Falls Road

The US Route 7 / Falls Road / Harbor Road intersection is a four-way signalized intersection. The northbound and southbound approaches on US Route 7 consist of two lanes each, and both feature a shared through/right-turn lane and a dedicated left-turn lane configuration. The left-turn lanes are approximately 100 feet long. Falls Road approaches US Route 7 at an acute angle but turns west just before the intersection to enter US Route 7 at a 90-degree angle. For approximately 75 feet this approach functions as two lanes with a shared through/left-turn lane and a dedicated right-turn lane. A one-way driveway serving various retail and residential land uses in the northeast quadrant of the intersection enters Falls Road from the north just 25 feet east of US Route 7. This driveway connects to a mobile home park on Shelburnewood Drive. The Harbor Road approach consists of a single lane approach; however, traffic will on occasion queue in two lanes with the informal right lane accommodating right-turning vehicles. The traffic signal provides protected left-turn phases for US Route 7 traffic and split (separate) signal phases for the Falls Road and Harbor Road approaches. Cross walks and pedestrian signal heads are provided for all legs of the intersection. Pedestrian crossings occur concurrent with parallel vehicular traffic flow. No exclusive pedestrian signal phases are provided. Utility poles located just a few feet off of the edge of the roadway in the northeast corner of the intersection appear to influence driver behavior resulting in right turns from Falls Road being made more slowly than might otherwise be expected.

3.2.2 US Route 7 / Church Street

The US Route 7 / Church Street intersection functions as a two-way stop controlled intersection with US Route 7 being the major roadway. Church Street enters US Route 7 from the east while a driveway serving the Town Offices and recreational fields approaches from the west. There is a stop sign on Church Street but not one for the driveway. Single lanes are provided on each intersection approach. Cross walks are present on the north and east legs of the intersection. The US Route 7 southbound approach has a 10-foot wide paved shoulder which extends to the western sidewalk. Southbound traffic often uses the wide shoulder to bypass vehicles turning left onto Church Street.

3.2.3 Church Street / Falls Road

Church Street forms a three-leg or "tee" intersection with Falls Road from the west at an acute angle. Church Street is controlled by a stop sign. All intersection approaches consist of a single lane each. Crosswalks are provided on the west and south legs of the intersection.

3.3 Traffic Volumes

Traffic volume data for the study area were collected from various sources. Daily traffic counts for US Route 7 and Harbor Road were available from VTrans. The CCRPC provided peak period vehicle turning movement counts for the three study area intersections.

Vehicle turning movement and classification counts were taken by the CCRPC on June 6, 2012 at each of the three study area intersections. The collected traffic data are included in Appendix A. These figures volumes were increased by ten percent to reflect Design Hour Volumes (DHV) following guidelines established by VTrans. Design Hour Volumes represent the 30^{th} highest hourly volumes of the year. Calculations showing how the DHV's were determined also are provided in Appendix A. Figures 3 and 4 provide existing DHV traffic flow networks for AM and PM peak hours and can be found on pages 10 and 11 respectively. The peaks generally occurred from 7:30 to 8:30 AM and from 4:45 to 5:45 PM. As shown, US Route 7 carries approximately 1200 to 1400 vehicles north of Church Street during the peak hour. Falls Road carries approximately 600 vehicles during both peak hours. The peak direction flows on US Route 7 and Falls Road are northbound (towards Burlington) during the morning peak hour. Evening peak hour flows are relatively balanced. Harbor Road carries 685 vehicles during the AM peak hour and 590 vehicles during the PM peak hour. The higher AM peak hour volumes are likely attributable to school traffic. Church Street is the lowest volume roadway in the study area, carrying less than 100 vehicles during the AM peak hour and slightly more than 100 vehicles during the PM peak hour.

The CCRPC performed a 12 hour turning movement count on May 21, 2009 at the US Route 7 / Harbor Road / Falls Road intersection. Using this data the following chart in Figure 2 below was developed to demonstrate how traffic volumes vary throughout the day. The data indicate there is a morning peak at 7:45 AM and an afternoon peak that begins at 2:30 PM (with the recess of school) and extends through the commuter hours until 5:15 pm. This PM peak varies from PM peak for the June 6, 2012 traffic data count.

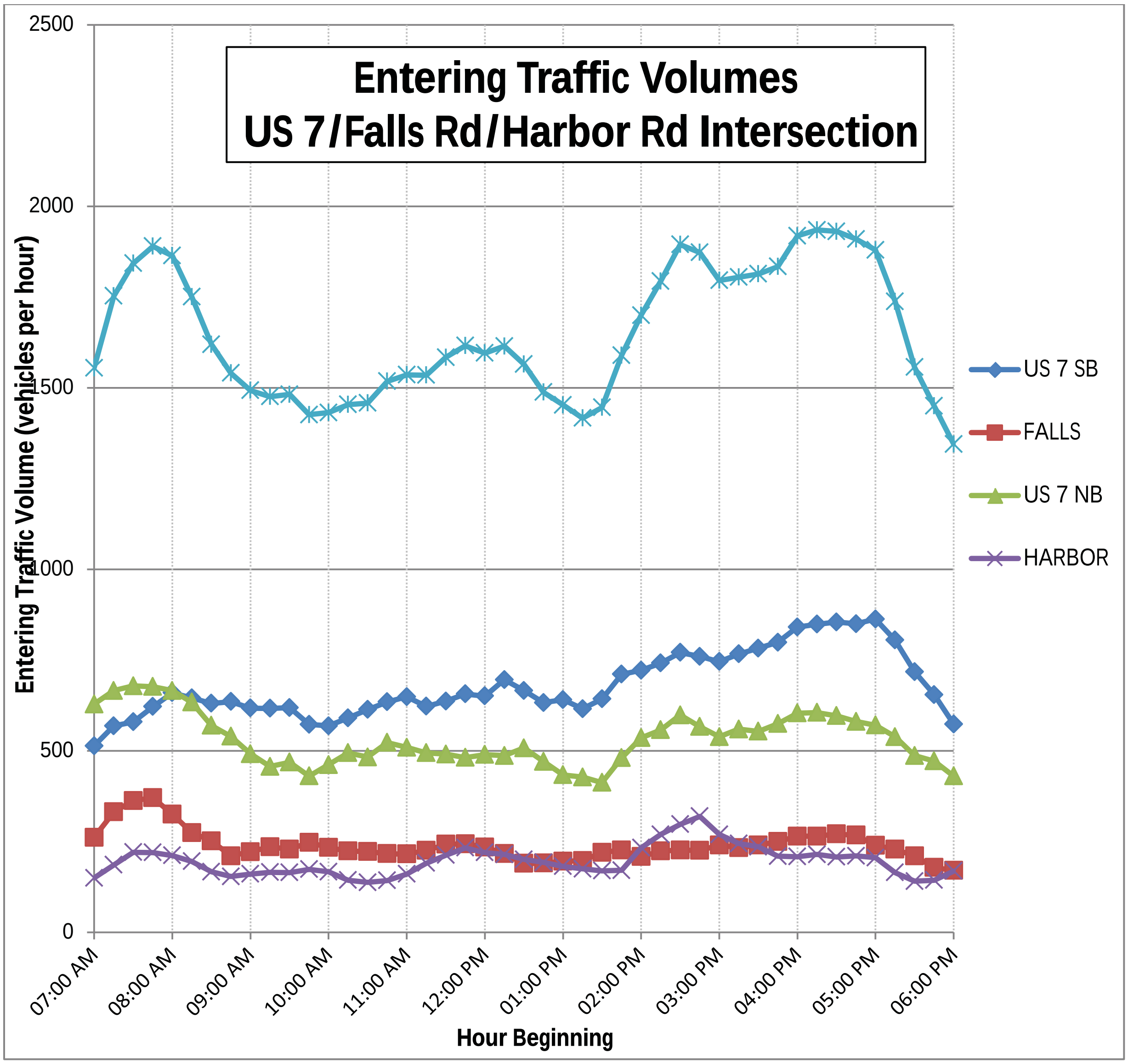


Figure 2: Entering Traffic Volumes

In addition, annual average daily traffic (AADT) volumes for the study area roadways were obtained from VTrans records. As noted in Table 1 below, available data indicates that US Route 7 carries 17,600 vehicles per day north of Falls Road (at Webster Road) while south of Falls Road it is estimated to carry 14,600 vehicles per day. Harbor Road carries 3600 vehicles per day. Recent counts are not available for Falls Road, however, based the peak hour counts reported above it is estimated that Falls Road carries 5000 vehicles per day.

Table 1: Existing AADT Volumes

Location	AADT	Count Years
US Route 7 North of Falls Road	17,600	2011
US Route 7 South of Falls Road	14,000	estimate
Harbor Road just West of US Route 7	3600	2010
Falls Road just East of US Route 7	5000	estimate

Truck traffic volumes are indicative of the regional importance of US Route 7. According to data collected by VTrans, US Route 7 traffic volumes are comprised of approximately ten percent trucks during the AM peak hour. PM peak hour volumes include approximately five percent trucks. In comparison, truck volumes on Falls Road and Harbor Road generally account for two to four percent of the total volume.

Pedestrian and bicycle volumes were also recorded as part of the June traffic count program. The pedestrian count data are included on the count sheets provided in Appendix A. Pedestrian volumes crossing US Route 7 range from approximately 15 to 20 pedestrians during peak hours at both Church Street and Falls Road. Comparable volumes were observed moving north and south along US Route 7. Fewer than 20 pedestrians per hour were observed at the Church Street/Falls Road intersection.

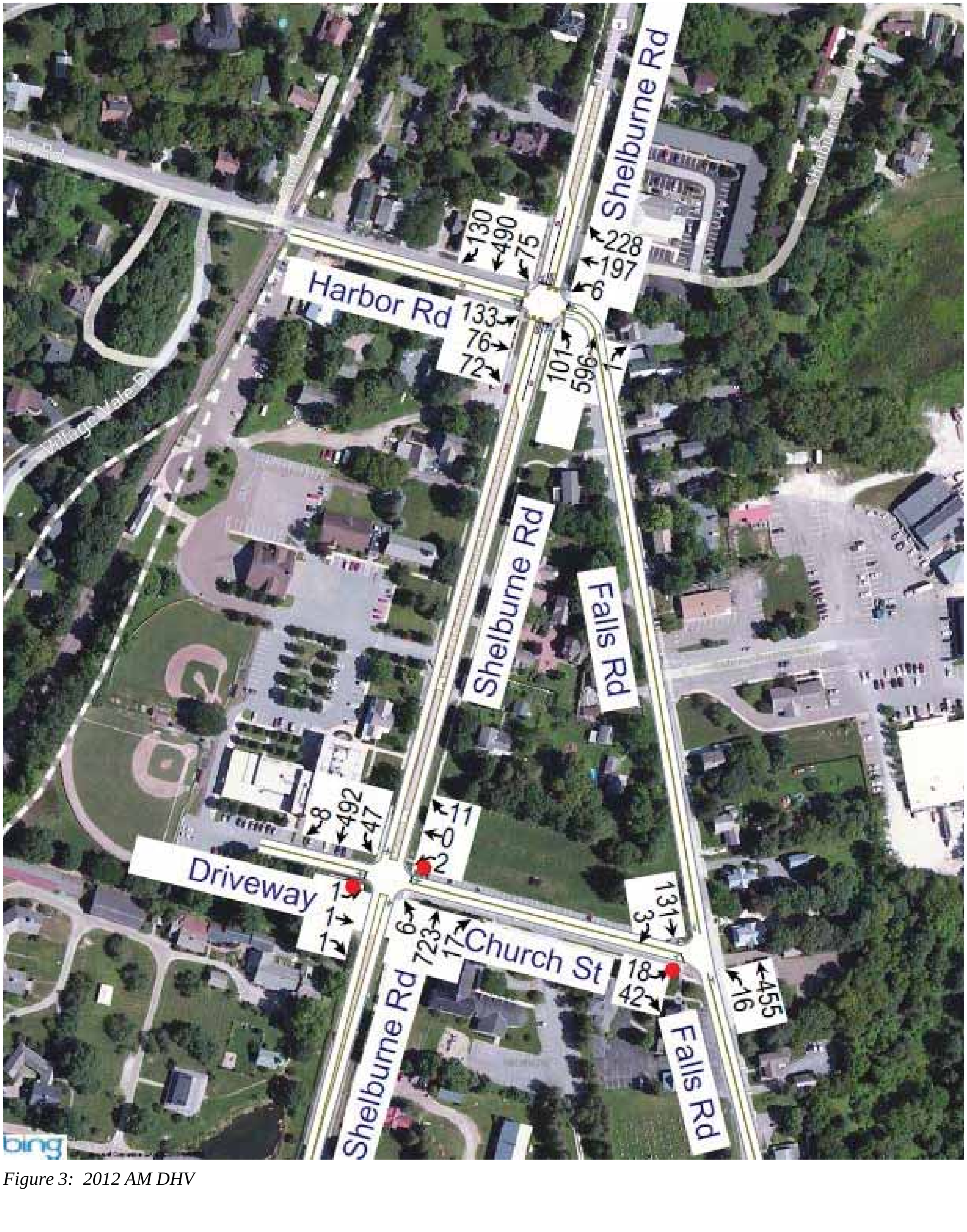


Figure 3: 2012 AM DHV

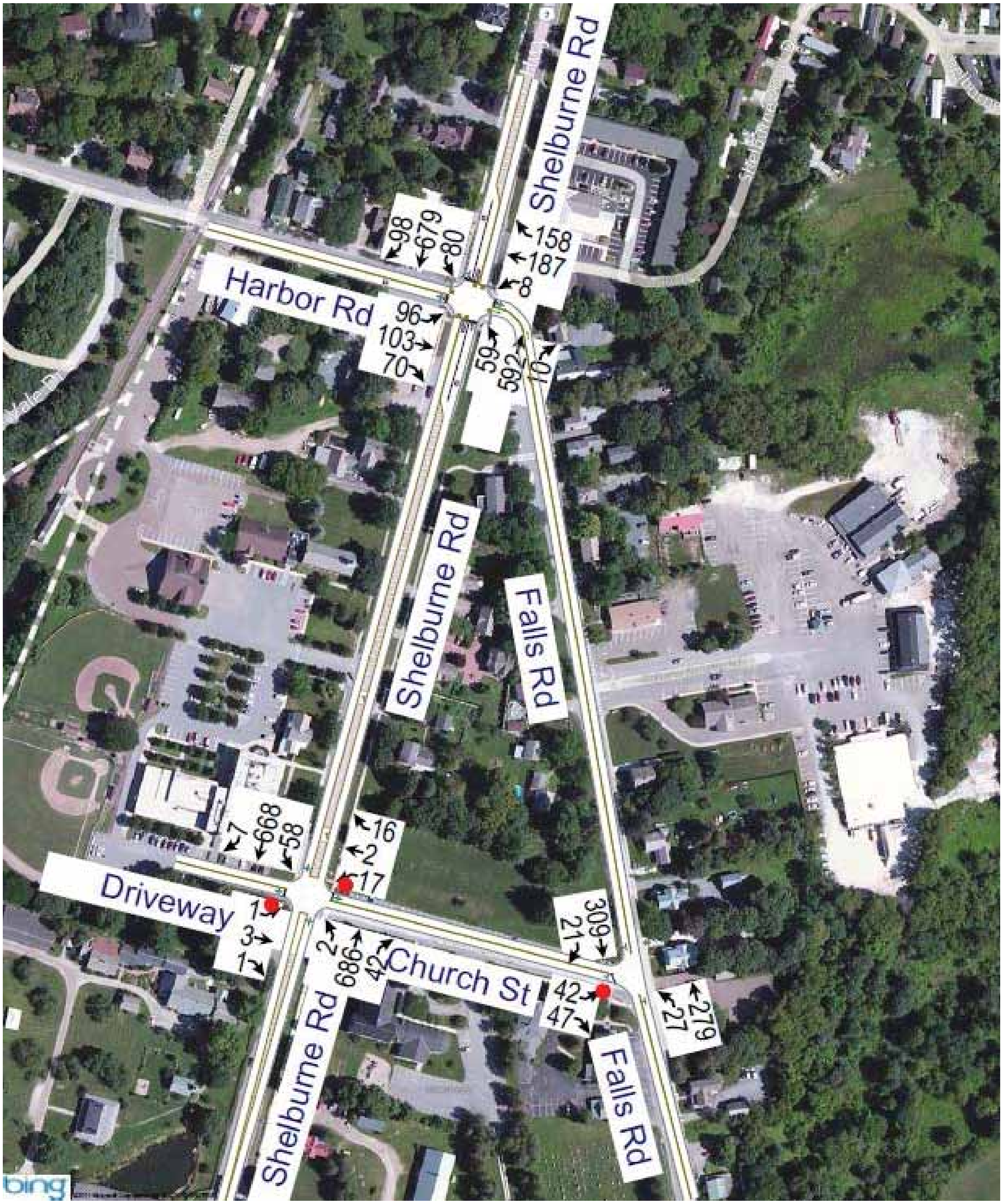


Figure 4: 2012 PM DHV

3.4 Intersection Operations

Intersection and roadway operating levels of service (LOS) have been calculated for the study area intersections based on the traffic volume, geometry and traffic control type previously mentioned. The results of these calculations, which are intended to quantify intersection operations, are presented below.

3.4.1 Level of Service Criteria

Level of service (LOS) is a term used to describe the quality of the traffic flow on a roadway facility at a particular point in time. It is an aggregate measure of travel delay, travel speed, congestion, driver discomfort, convenience, and safety based on a comparison of roadway system capacity to roadway system travel demand. Operating levels of service are reported on a scale of A to F, with A representing the best operating conditions with little or no delay to motorists, and F representing the worst operating conditions with long delays and traffic demands sometimes exceeding roadway capacity.

Intersection operating levels of service are calculated in accord with procedures defined in the *Highway Capacity Manual*, published by the Transportation Research Board. For unsignalized and signalized intersections the operating level of service is based on travel delays. Delays can be measured in the field but generally are calculated as a function of the following: traffic volume; peaking characteristic of traffic flow; percentage of heavy vehicles in the traffic stream; type of traffic control; number of travel lanes and lane use; intersection approach grades; and pedestrian activity. Through this analysis, volume-to-capacity ratios can be calculated for individual movements or for the intersection as a whole. A volume-to-capacity ratio of 1.0 indicates that a movement or intersection is operating at its theoretical capacity. The specific delay criteria applied per the *2010 Highway Capacity Manual* to determine operating levels of service are summarized in Table 2.

Table 2: Intersection Level of Service Criteria

	Average Delay per Vehicle (Seconds)	
Level of Service	**Signalized Intersections**	**Unsignalized Intersections**
A	≤10.0	≤10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F[1]	>80.0	>50.0

[1]Level of Service F is also assigned if the volume-to-capacity ratio exceeds 1.0 for a specific movement or lane group. For approach-based and intersection assessments, LOS is defined solely by delay. (Source: *HCM 2010 Highway Capacity Manual*, Transportation Research Board, National Academy of Sciences, Washington, DC, 2010.)

For two-way stop controlled intersections, the major approaches have the right-of-way and experience little to no delay aside from impeding left or right-turning vehicles. Generally speaking the delays at two-way stop controlled intersections are experienced on the minor approaches. As a result, there is no methodology for calculating an intersection LOS at two-way stop controlled intersections.

3.4.2 Calculated Operating Levels of Service

Capacity analysis results for the study area intersections are presented in Table 3 below. As shown, under existing design hour conditions, the US Route 7 / Harbor Road / Falls Road intersection is operating at Level of Service E. Additionally, traffic volumes are approaching the theoretical carrying capacity of the intersection. (The calculated volume-to-capacity ratios for some movements exceed 90 percent.) On US Route 7, the southbound through movements operating in conflict with northbound left-turn movements experience the longest delays during both peak hours. At the US Route 7 / Church Street intersection, calculated delays for traffic exiting Church Street to Route 7 are in the LOS F range during the PM peak hour. However, the volume experiencing this delay is approximately 30 vehicles per hour. Southbound left turns at this location operate at LOS A or better during both peak hours. The Church Street/Falls Road intersection operates well below capacity with nominal delays.

Table 3: Existing Intersection Capacity Analysis Results

		Existing (2012)		
	Peak Hour	LOS[1]	Delay[2]	V/C[3]
Signalized Intersections				
US Route 7 / Falls Road / Harbor Road				
	AM	E	78.2	1.03
	PM	F	80.4	1.06
Unsignalized Intersections				
US Route 7 / Church Street				
	AM	D	30	0.02
	PM	F	61.9	0.36
Church Street / Falls Road				
	AM	B	10.7	0.09
	PM	B	13.0	0.16

Notes: For signalized intersections, results shown for LOS and Delay represent the entire intersection as a whole. For unsignalized intersections, results shown are for the worst operating minor street approach.

[1] LOS= Level of Service

[2] Delay = Average delay expressed in seconds per vehicle

[3] V/C = Volume-to-capacity ratio for critical movements

3.5 Land Use and Zoning

Most of the project area is zoned Village Center Mixed Use. The zoning is intended to accommodate a variety of retail and office uses, government facilities, residential uses, churches, schools and other uses that serve the community. The area is part of the Village Design Review Overlay District, where most alterations are subject to a review by the Shelburne Historic Preservation and Design Review Commission (HPDRC). The HPDRC makes recommendation regarding proposals and the Development Review Board (DRB) issues approvals. The area is also part of the Village Core Overlay District that allows certain type of redevelopment of existing structures.

The project area contains a wide variety of existing land uses including commercial, retail, office, and residential. Over the years many of the residential properties have converted to commercial use.

3.6 Pedestrian and Bicycle Facilities

The Town has made great progress over the years expanding and improving the local sidewalk and bicycle network. There are a few remaining sidewalk sections to be added including the north side of Harbor Road, the west side of Falls Road and US Route 7 on the west side along Shelburne Museum.

Marked crosswalks on US Route 7 exist at the US Route 7 / Falls Road / Harbor Road intersection, the Church Street intersection and at the covered bridge staff entrance to the Shelburne Museum. The crosswalks at the US Route 7 / Harbor Road / Falls Road intersection have a pedestrian signal head and phase that operates concurrent with unconflicting through traffic. The Falls Road and US Route 7 south-side crosswalks operate with a school crossing guard in the morning and afternoon school periods. The Church Street crosswalk is unsignalized but is signed and does operate with a school crossing guard during the morning and afternoon school periods.

School children on bicycles tend to use the existing sidewalks and guarded crosswalks. On-road bicycle facilities are limited and the VTrans resurfacing project plans to provide a four-foot shoulder on US Route 7. This area of US Route 7 is part of the Lake Champlain Bikeway.

3.7 Transit Service

Chittenden Country Transportation Authority (CCTA) operates the Shelburne Road bus route along US Route 7. It provides a connection between Burlington, South Burlington, and the Shelburne. In Shelburne Village it includes a loop of US Route 7, Marsett Road and Falls Road. The bus frequency is generally every half hour except one morning express bus creates a 15-minute interval. Figure 5 shows the route of this bus service and Figure 6: Existing Conditions Plan shows the signed bus stop locations. There is an existing bus shelter in the project area. It is located on the west side of US Route 7 adjacent to the municipal facilities.

The CCTA also operates a Burlington – MiddleburyLink Express bus route. It operates hourly for 2 hours in the AM and PM commuter hours. There is a signed stop on the east side of US Route 7, opposite the municipal facilities.

Figure 5: Shelburne Bus Route

3.8 Crash History

The crash history for the study area was investigated using the VTrans crash database. VTrans keeps records of reported crashes by milepost along State and Federal Aid highways in Vermont. General Yearly Summaries can be requested from VTrans for given roadway segments. The summaries note the location (mile marker), date, time of day, weather conditions, contributing circumstances and severity for reported crashes. For this study VTrans reports for 2007 through 2011 (included in Appendix A) were reviewed for US Route 7 between mile marker 1.74 (approximately 265 feet south of Church Street) and mile marker 2.03 (approximately 265 feet north of Falls Road).

Table 4 below provides a summary of the crash data. As shown, the Harbor Road / Falls Road intersection experienced the greatest number of crashes with 30 reported over a five-year period. Fourteen crashes occurred at the US Route 7 / Church Street intersection. Another seven crashes occurred on the roadways segment between the two intersections. The most prominent crashes at both intersections were rear-end collisions. Crashes were most often observed during the midday and afternoon commuter peak hours when congested, “stop-and-go”, conditions are experienced along US Route 7. Collisions were predominantly property damage only events, however, a total of six crashes involving injuries were noted. No fatalities occurred in the project area.

VTrans also maintains a High Crash Location (HCL) list for State and Federal Aid highways. High Crash Locations experience at least five crashes over a five-year period and a crash rate that is statistically higher than the statewide average crash rate for similar roadway facilities. This list was most recently updated to include crash experience from 2006 through 2010. None of the study area intersections are included on the HCL list. Crash rates for the study area intersections were determined based on the 2007-2011 data using the peak hour traffic volume data presented above. As shown in Table 4, the crash rate for the US Route 7 / Harbor Road / Falls Road intersection, 0.89 crashes per million entering vehicles (MEV), is slightly lower than the statewide average crash rate for similar intersections. The statewide average crash rate for intersections between principal arterials and major collectors in urban areas is 1.153 crashes per MEV.

Table 4: Crash Summary (2007 - 2011)

Year	US Route 7 / Church Street	US Route 7 / Falls Road / Harbor Road	TOTAL	Non-Intersection Crashes
2007	1	3	**4**	0
2008	0	2	**2**	0
2009	1	5	**6**	6
2010	6	9	**15**	1
2011	6	11	**17**	0
Total	**14**	**30**	**44**	**7**
Type				
Angle	3	5	**8**	0
Rear-end	9	17	**26**	5
Head-on	0	1	**1**	0

Unknown-other	2	7	**9**	2
Total	**14**	**30**	**44**	**7**
Severity				
Property Damage	11	28	**39**	6
Personal Injury	3	2	**5**	1
Fatality	0	0	**0**	0
Other	0	0	**0**	0
Total	**14**	**30**	**44**	**7**
Weather				
Clear	9	18	**27**	5
Cloudy	1	5	**6**	1
Rain	2	5	**7**	0
Snow/Ice	1	1	**2**	0
Fog	0	0	**0**	0
Unknown	1	1	**2**	1
Total	**14**	**30**	**44**	**7**
Time				
7:00AM to 9:00AM	1	0	**1**	2
9:00AM to 4:00PM	11	10	**21**	3
4:00PM to 6:00PM	2	11	**13**	1
6:00PM to 7:00AM	0	7	**7**	1
Unknown	0	2	2	0
Total	**14**	**30**	**44**	**7**
Statewide Average Crash Rate:	0.684	1.153		4.852
Observed Crash Rate:	**0.67**	**0.89**		**3.42**

3.9 Natural Resources

Stantec has also evaluated the natural resources present within the Shelburne US Route 7 Falls Road / Harbor Road Scoping Project corridor. As noted above, the study area includes an approximately 1,500-foot long section of US Route 7 in Shelburne, extending from south of Church Street to north of the US Route 7 / Falls Road / Harbor Road intersection. It also includes a section of Harbor Road from US7 west to the railroad crossing, and a section of Falls Road to south of the Village Green. For the purposes of the Natural Resource review, the study area includes a corridor 50 feet from centerline along these roads. The project also includes a secondary area for alternative analysis, namely the area surrounding the intersection of Church Street and Falls Road (see previous Project Study Area map on page 2).

As part of investigating existing conditions, Stantec identified and characterized observable rare, threatened or endangered (RTE) species, wetlands, streams, wildlife habitat, agricultural land, and conservation zones. Wetland boundaries under state and federal jurisdiction were determined using the technical criteria described in the 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual:

North central and Northeast Region (Version 2.0). Following is a summary of Stantec's findings.

3.9.1 General Site Description

The project corridor is a developed area that includes existing roadways, roadsides, buildings, sidewalks, utility corridors, and drainage features. Vegetation within the corridor is limited to maintained lawns and ornamental plantings.

3.9.2 Natural Resource Review Summary

Review of Existing Materials
According to the Natural Resource Conservation Service (NRCS) Web Soil Survey[2] for Chittenden County, Vermont, soils are mapped as Enosburg and Whately soils, 0-3% slopes; Hinesburg fine sandy loam, 0-3% slopes, and Fill land. The Enosburg and Whately soils are considered hydric as well as farmland soils of statewide importance, while the Hinesburg soils are considered prime farmland soils. Note that all of these soils types have been disturbed in some way by previous construction in the project area.

In the secondary study area, soils are mapped as Enosburg and Whately soils, 0-3% slopes and Groton gravelly fine sandy loam, 0-5% slopes. As noted above, the Enosburg and Whately soils are considered all hydric, while the Groton soils are not hydric. These soil types are considered farmland soils of statewide importance.

Stantec used the Vermont Agency of Natural Resources (ANR) Environmental Interest Locator web application to assess the likelihood of the presence or absence of mapped Vermont Significant Wetland Inventory (VSWI) wetlands and rare, threatened, and endangered (RTE) plant and animal species. According to this web application,[3] there are no VSWI wetlands, RTE species, or significant natural communities mapped within the project area (see attached ANR Map).

Stantec also reviewed the Shelburne Town Plan maps (2012). According to these maps, there are no wetlands or significant wildlife habitat located within the study areas.

Wetlands and Streams
No wetlands or streams were identified within the project corridor.

RTE Species
Stantec identified no RTE plant species during the June 27, 2012 site visit. Because the majority of the area has been previously disturbed by development, it is unlikely that any RTE plant species occur within the project corridor.

Wildlife and Wildlife Habitat
The project area is a relatively narrow corridor along an existing road, flanked by commercial and residential developments and their parking areas. This narrow

[2] Natural Resource Conservation Service Web Soil Survey: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Refer to map for Chittenden County, Vermont. Accessed on June 27, 2012.
[3] http://maps.vermont.gov/imf/sites/ANR_NATRESViewer/jsp/launch.jsp

corridor has limited wildlife habitat value, and likely supports occasional use by songbirds and transient wildlife species.

Agricultural Land
As described above, according to the NRCS Web Soil Survey for Chittenden County, Vermont, some soils within the study corridor are considered farmland soils of statewide importance or prime farmland soils. However, the project area is not used for agriculture, and the narrow strip alongside the existing pavement does not provide agricultural value as the affected land is likely deemed to be in "urban use." Any impact to these soils would require submittal of a Farmland Conversion Impact Rating Form 1006 to USDA for their authorization.

Park/Conservation Zones
Two Town-owned areas are present within the study area: the Village Green located in the triangle southeast of the intersection of US7 and Falls Road, and the Parade Grounds located north of Church Street. Both of these park lands have local significance and would therefore likely qualify as "Section 4(f)" resources. According to a review of Land & Water Conservation Fund (LWCF) Projects from 1965-2011, no areas within the corridor were purchased with LWCF funds. Therefore, there are no "Section 6(f)" public lands present.

Section 4(f) of the U.S. Department of Transportation Act of 1966 prohibits the "use" of certain lands—specifically: 1) any publicly owned land in a public park, recreation area, or wildlife and waterfowl refuge of national state, or local significance, or 2) any land from a historic site of national, state, or local significance (collectively "Section 4(f) resources") —unless there is no feasible and prudent alternative to the use of such land and the project includes all possible planning to minimize harm to the resource.

3.9.3 Summary

In summary, the Village Green and Parade Grounds are two publicly-owned park lands within the project corridor. These areas are being considered "Section 4(f)" resources due to their local significance, and impacts to these resources should be avoided.

3.10 Hazardous Material Sites

The VANR Environmental Interest Locator was used to identify potential hazardous material sites. Two sites in the project area were the Mobil Station on the northwest corner of US Route 7 and Harbor Road and the Shelburne Inn property on the east side of US Route 7. It is suspected these properties have had a history of contaminated soils that are addressed or monitored. For this project, depending on the property improvements, during design development some contaminated soil testing may be needed to confirm the presence of hazardous material and to account for handling it.

3.11 Historic Sites and Structures

Suzanne Jamele, a Vermont-based Historic Preservation Consultant working on Stantec's behalf, has developed a report that identifies historic resources within the proposed project's Area of Potential Effect (APE). As set force in Federal Regulations the APE is "the geographic area within which the project may cause changes to the character or use of the historic properties" [36CFR 800.2(c)] that are listed on or appear to be eligible for listing on the National Register of Historic Places. Eventually a final report will also provide a preliminary assessment of effect for the proposed project alternatives. A site visit was conducted by the consultant on July 11, 2012, at which time photographs were taken. A file review to identify sites in the project area was undertaken on June 26, 2012 at the Vermont Division for Historic Preservation in Montpelier, VT. Additional research was conducted at the Vermont Historical Society Library in Barre.

The proposed project is located almost entirely within the boundaries of the Shelburne Village Historic District, which is listed on the National Register of Historic Places. Only a small southwestern corner of the project area, located in front of the "Weed House"- the most northeasterly building of the Shelburne Museum, is outside the historic district boundaries. The district boundary crosses US Route 7 at the northern lot line of the Museum and then runs southerly along the east side of Route 7. The district extends beyond the project area in all other directions.

The road that became Route 7 was laid out in 1789 as the stage road running south from Burlington to Middlebury. Historic maps indicate that Falls Road, which meets Route 7 in the center of the village, was extant by the late 18th century, linking the original settlement in Shelburne Falls to what was to become the primary village center. The two roads form an inverted "V" bisecting the village. Running west from this intersection, Harbor Road, was also in place by the late 18th century. Thus, the crossroads intersection in the center of the village is a configuration that has been extant since the early years of the community and is the area around which the village developed. In 1796 early settler Benjamin Harrington built a local public house, which in time came to be known as the Shelburne Inn.

During the first half of the 19th century, development proceeded southward from the intersection on both sides of the green, where houses and shops were built. After 1850, when the railroad arrived, the commercial center shifted to Harbor Road. Increasing prosperity and population growth in the years following the arrival of the railroad. This growth and prosperity led to the construction of Italianate and Queen Anne style homes and churches in the village. The public school and town hall on Route 7, built in the Neo-Classical style, reflect design standards of the 1920s while the Dutch Colonial house at the southwest corner of the district represents typical single family home construction of the period. The Modern style gas station on the corner of Route 7 and Harbor Road reflects mid-century iconic automobile era commercial design.

Historic photos from the early 20th century, looking south from the crossroads, show the triangular green space, long a focal point in the center of the village, nestled between Route 7 and Falls Road. However, until the mid-20th century, the green space was composed of two sections, a layout that is clearly evident on the 1869

Beers map. Originally, the existing triangle in front of the former Pierson Library, was smaller and there was a separate triangular "island" immediately to the north. Falls Road approached the two green areas and formed a "Y" on either side of the northern green area. The two areas were separated by a leg of Falls Road that turned west onto US Route 7. That leg was eliminated and grassed over. The northern end of the existing green was shortened and paved over on the north end to make room for a 90 degree turn onto US Route 7. In 1967 traffic lights were installed at the reconfigured intersection.

A second green space, which has functioned as the Town common and is locally known as "the Parade", is also located between Route 7 and Falls Road. This rectangular common is situated at the point where Church Street connects the two roads. The Parade is a contributing site (#36) in the historic district. This common was laid out and deeded to the town in 1807 by one if its early settlers, Benjamin Harrington, for use as a training area for the Town's militia. From 1871 to 1926 it served as a playground for the Village School. It has long been used as a community gathering spot for celebrations and activities. A rock-faced boulder memorial honoring Benjamin Harrington was placed on the Parade in 1977. It rests along the side of the green facing Church Street. Church Street, with its two masonry churches, frames the southern end of the Parade.

The village streets are lined with buildings that are excellent examples of 19th and early 20th century architectural styles. The buildings date from the early days of settlement in the late 18th century to the mid-20th century and provide a visual record of the town's history. Buildings are 1- 2 ½ story, largely wood frame, gable roof structures, although there are some brick buildings and three masonry churches. The historic village remains largely intact with new construction set primarily on rear lots, back from the road and therefore visually unobtrusive. Despite the heavy traffic on US Route 7 the village maintains the character of a small late 19-early 20th century village center surrounding public green spaces.

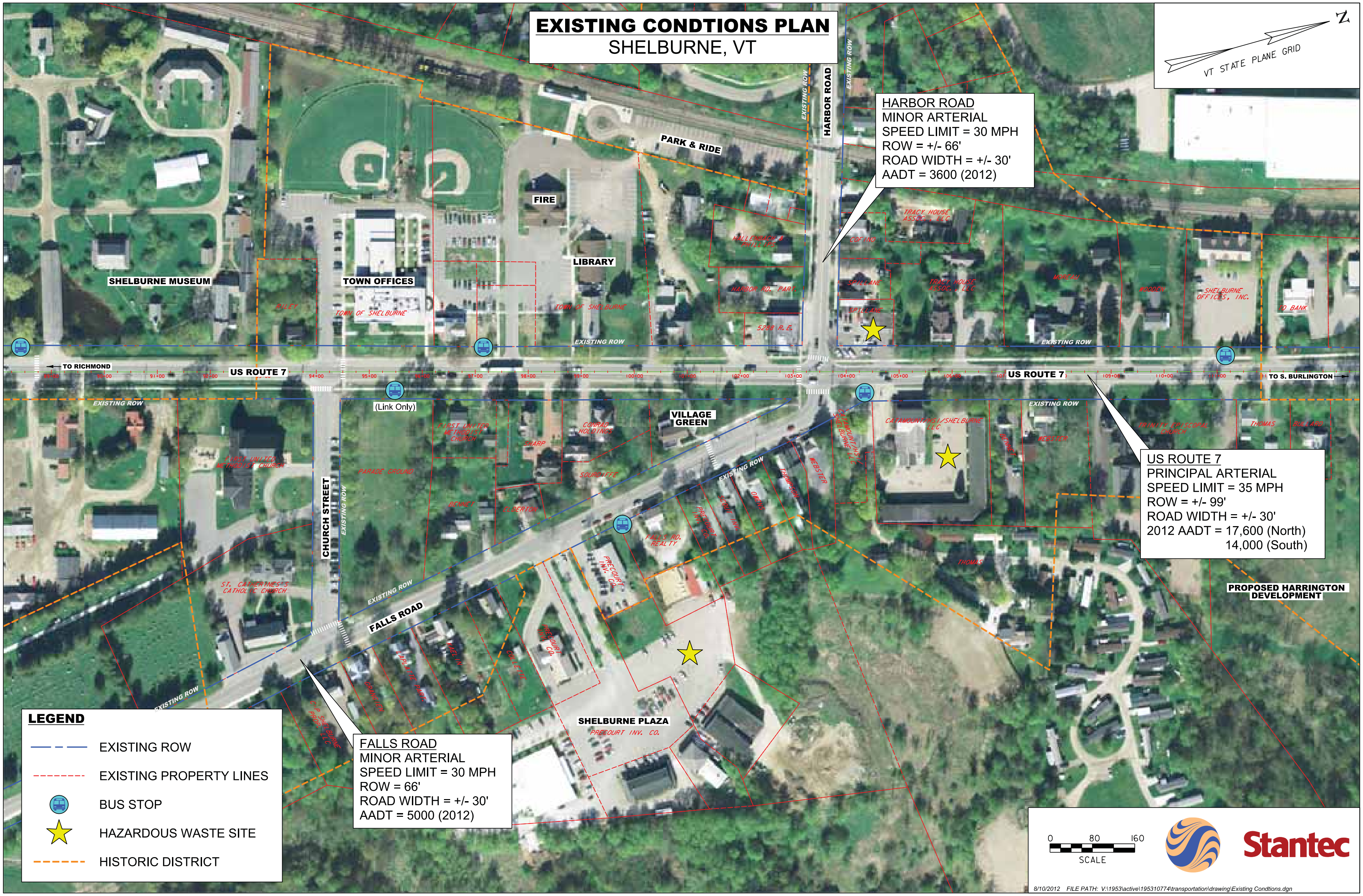
Most buildings in the proposed project area are contributing structures in the historic district. Evaluation of the buildings during the July 12, 2012 site visit indicated that all of the structures continue to retain their architectural integrity and status as contributing structures. The motel portion of the Shelburne Inn (#8 in the district) remains noncontributing due to its late 20th century construction date. The ranch house at 8 Railroad Lane (#63 in the historic district), on the corner of Harbor Road, was built in 1970 and also remains noncontributing due to age. The building at 63 Harbor Road (#52 in the historic district), facing the railroad tracks, remains noncontributing due to alteration. The gas station on the northwest corner of the intersection (#72 in the historic district) was built in 1953 and was considered noncontributing due to age at the time the district nomination was prepared (1989). It has since become 50 years old and is an altered but recognizable example of a gas station design created for Texaco c. 1940 by Walter Dorwin Teague. Examples of period gas stations are becoming rare and are a significant resource related to the growth of the automobile era. The building should now be considered eligible for the National Register as a contributing structure in the historic district.

3.12 Archaeological Sites

The Vermont Division for Historic Preservation Internet Mapping Site was accessed and used to formulate the archaeological sensitivity of the proposed project area (VDHP 2009). The mapping site evaluates the precontact potential of all areas of Vermont, based on 11 environmental factors, such as the presence of specific terrain, soils, or proximity to streams or wetlands. If an area possesses just one of these environmental characteristics, it is considered by the Vermont Division for Historic Preservation (VDHP) / State Historic Preservation Officer (SHPO) to be archeologically sensitive. Based on the Vermont ArcheoMap Information System (VAMIS), the entire project area possesses three sensitivity factors, including its location on a glacial outwash terrace near a permanent stream, and the presence of level terrain. The southern end of the project APE possesses the additional sensitivity factor of proximity to the head of the drainage.

The VDHP Environmental Predictive Model was completed for the project area, which produced an overall rating of 24, with a rating of 32 or above indicating precontact sensitivity. The project area received points based on its location within a travel corridor, situated on a level terrace near the La Platte River and wetlands. The rating of this project area is somewhat problematic. The project area received 32 additional points based on the high density of precontact sites in the area, although most of the sites were situated in different environmental settings than that of the APE. These points were negated by the loss of 32 points for previous disturbance from the construction of roads, sidewalks, drainage ditches, utility lines and parking areas.

The general project area is considered to be an area of moderate precontact sensitivity. It is possible that precontact sites are present in undisturbed areas exhibiting level terrain. Areas directly adjacent to the roadway are considered to be disturbed from the construction of roads, sidewalks, driveways, drainage ditches and utility lines. The areas which may contain undisturbed soil stratigraphy are level areas of green space, including the grass lawns associated with the historic houses located within the Shelburne Village Historic District. If the proposed project plans involve impacts beyond the limits of the sidewalk onto level grass areas, then further archeological investigation is recommended.


EXISTING CONDTIONS PLAN
SHELBURNE, VT
VT STATE PLANE GRID
HARBOR ROAD
MINOR ARTERIAL
SPEED LIMIT = 30 MPH
ROW = +/- 66'
ROAD WIDTH = +/- 30'
AADT = 3600 (2012)
US ROUTE 7
PRINCIPAL ARTERIAL
SPEED LIMIT = 35 MPH
ROW = +/- 99'
ROAD WIDTH = +/- 30'
2012 AADT = 17,600 (North)
14,000 (South)
FALLS ROAD
MINOR ARTERIAL
SPEED LIMIT = 30 MPH
ROW = 66'
ROAD WIDTH = +/- 30'
AADT = 5000 (2012)
PARK & RIDE
FIRE
LIBRARY
TOWN OFFICES
SHELBURNE MUSEUM
VILLAGE GREEN
SHELBURNE PLAZA
CHURCH STREET
HARBOR ROAD
FALLS ROAD
US ROUTE 7
TO RICHMOND
TO S. BURLINGTON
(Link Only)
EXISTING ROW
PROPOSED HARRINGTON DEVELOPMENT
LEGEND
EXISTING ROW
EXISTING PROPERTY LINES
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4.0 Project Purpose and Need

Consistent with established Scoping guidelines, the current project involved the development of a Purpose and Need statement. Stantec, with input from Project Committee Members and the Public, developed the following text:

Purpose: The purpose of the US Route 7/Harbor Road /Falls Road project is to create a safe and efficiently operating intersection to enhance mobility, access, and safety for all users.

Need: The performance of the intersection is considered deficient based on the regular vehicle queues and delays, and limited on-road bicycle facilities.

1. **Intersection capacity:** This signalized intersection regularly experiences queues and congestion during the AM and PM peak hours. The significant number of left turns for the US Route 7 southbound and Harbor Road approaches contribute greatly to congestion. Capacity is further inhibited by the numerous accesses and parking adjacent to the intersection, insufficient curb radii to accommodate large turning vehicles, and insufficient left-turn lane lengths to allow for their access and use.

2. **Bicycle facilities:** The recent VTrans resurfacing project provided four-foot wide shoulders in most of the project area. This makes this important Lake Champlain Bikeway segment more bicycle friendly. It also links to the wider shoulders and on-road bicycle facilities to the north and south. As US Route 7 approaches the signalized intersection the shoulders narrow to two to three feet. School children on bicycles are served by the existing sidewalks.

3. **Pedestrian facilities:** Sidewalks have been expanded over the years so that most of US Route 7 has a sidewalk on both sides. Sidewalks are planned for a few remaining sections. Crosswalks exist on US Route 7 at the signalized intersection and the Church Street intersection. Sidewalks are typically not separated from the roadway with curbs but often include grassed buffer strips. The update of the Shelburne Village Plan indicated the overall concept for US Route 7 is to create a “boulevard” character by rows of trees, curbs, and wider sidewalks to better define roadway and pedestrian zones.

4. **Traffic calming / Gateway:** This area represents the historic village core of Shelburne. To the north and south, US Route 7 transitions to larger, more recently developed parcels and less pedestrian activity. The posted speed limit is reduced to 35 mph as traffic transitions to the study area with more pedestrians; school children activity; and numerous driveways, streets, and turning vehicles. Improvements need to consider providing a design and context that introduces motorists to the village area and promotes respect of the posted speed limit.

5.0 Design Criteria

Based on pertinent standards and references, applicable design criteria are tabulated below. These references include:

- Vermont State Standards for the Design of Transportation Construction, Reconstruction and Rehabilitation on Freeways, Roads and Streets (VSS)
- A Policy on Geometric Design of Highways and Streets (AASHTO)

Table 5: Design Criteria

Parameter	US Route 7	Harbor Road	Falls Road	Reference
Functional Classification	Urban Principal Arterial	Urban Major Collector	Local Road[4]	
AADT (2012)	17,400 vpd	3,600 vpd	5,000 vpd	
Design Vehicle	WB-62	WB-62	WB-62	
Posted Speed	35 mph	25 mph	30 mph	
Design Speed	40 mph	30 mph	30 mph	
Stopping Sight Distance	300 ft.	200 ft.	200 ft.	VSS Sect. 3.4.1; 5.4.1
Corner Sight Distance	440 ft.	330 ft.	330 ft.	VSS Sect. 3.4.2; 5.4.2
Travel Lane Width				
Minimum	10 ft.	9 ft.	9 ft.	VSS Sect. 3.5; 5.5
Existing	11 ft.	11 ft.	11 ft.	
Proposed	11 ft.	10 -11 ft.	10 ft.	
Shoulder Width (Shared use)				
Existing	2-4 ft.	2-4 ft.	2-4 ft.	
Minimum w/ Bicycles	4 ft.	3 ft.	3 ft.	VSS Sect. 3.14, 5.1.4
Proposed	4 ft.	2-4 ft.	2 ft.	
Clear Zone				
With Vertical Curb	1.5 ft.	1.5 ft.	1.5 ft.	VSS Sect. 3.9; 5.9
Without Vertical Curb	14-16 ft.	12-14 ft.	12-14 ft.	VSS Sect. 3.9; 5.9
Horizontal Alignment				
@ emax = 0.04	573 ft.	302 ft.	302 ft.	AASHTO, Table III-8
@ sensitive resources (DS-10 mph)	302 ft.	130 ft.	130 ft.	AASHTO, Table III-8
@ intersection approach (DS-15 mph)	225 ft.	120 ft.	120 ft.	AASHTO, Table III-8 & III-7
@ reverse crown	N/A	2,292 ft.	2,292 ft.	AASHTO, Table III-8 & III-7
@ normal crown	N/A	3,820 ft.	3,820 ft.	AASHTO, Table III-8 & III-7

[4] Although technically Falls Road is classified as a local road it functions today as a major collector. The design criteria shown is for a major collector.

6.0 Future Conditions

Roadway and traffic conditions in the study area were projected to a future design year of 2032. Estimated peak hour traffic volumes were determined based on proposed land development projects in the area and historic traffic growth trends. Intersection operations were then analyzed for the future travel demands. Planned roadway improvements were also considered in the analysis of future conditions.

6.1 Planned Roadway Improvements

The Town of Shelburne is contemplating but at present not actively planning for the construction of a new roadway in Shelburne Village that would be located east of and generally parallel to Route 7. The proposed "Loop Road", depicted schematically in Figure 7, would provide an alternative means of access to the village core from areas to the northeast. These areas include: existing commercial properties such as the Shelburne Shopping Park; the proposed Harrington Village residential development; and, the potential development of the Thomas parcel. The roadway would connect the north side of the Shopping Park to the proposed Harrington Village driveway passing through or around the existing Shelburnewood Mobile Home Park. The Harrington Village driveway will meet Route 7 approximately 1000 feet north of Falls Road.

An evaluation of the Loop Road proposal (letter report to Mr. Jason Charest of the Chittenden County Regional Planning Commission dated January 23, 2013, Loop Road Operations Analysis, Shelburne, VT) indicates that construction of the Loop Road would have only a nominal impact on traffic volumes at the Route 7 / Falls Road / Harbor Road intersection. Given its proposed alignment, it would not function as a "bypass" removing through traffic from either US Route 7 or Falls Road. It would, however, allow new development, identified below, to occur in Shelburne Village without increasing volumes through the US Route 7 / Harbor Road / Falls Road intersection.

Figure 7: Proposed Loop Road

6.2 Future Traffic Volumes

This study assumes that traffic volumes will increase at the subject intersection over the next twenty years due to a combination of background traffic growth and approved land development projects. This study does not assume the construction and benefits of the proposed Loop Road. An overall background traffic growth of 10% was applied to existing volumes to account for anticipated 20 year traffic growth due to development and demographic changes outside the immediate study area. Also, traffic volumes associated with approved development projects within or adjacent to the study area were accounted for in the traffic forecasts. Specific developments considered include the proposed Harrington Village project and redevelopment of the Rice Lumber property on US Route 7. The Harrington Village project, to be located in the northeast quadrant of the existing village center, will include 84 residential units. The Rice Lumber building supply store located just north of the study area on US Route 7 has obtained permits to subdivide and redevelop the property adding up to 140 PM peak hour trips to US Route 7 south of the site. Potential development considered includes the construction of 100 residential dwelling units in the village center on the Thomas Parcel and an expansion of the Shelburne Shopping Park by 4800 square feet of retail space. The resulting 2032 AM and PM peak hour traffic flow networks that consider background traffic growth and site specific developments are shown in Figures 8 and 9 respectively.

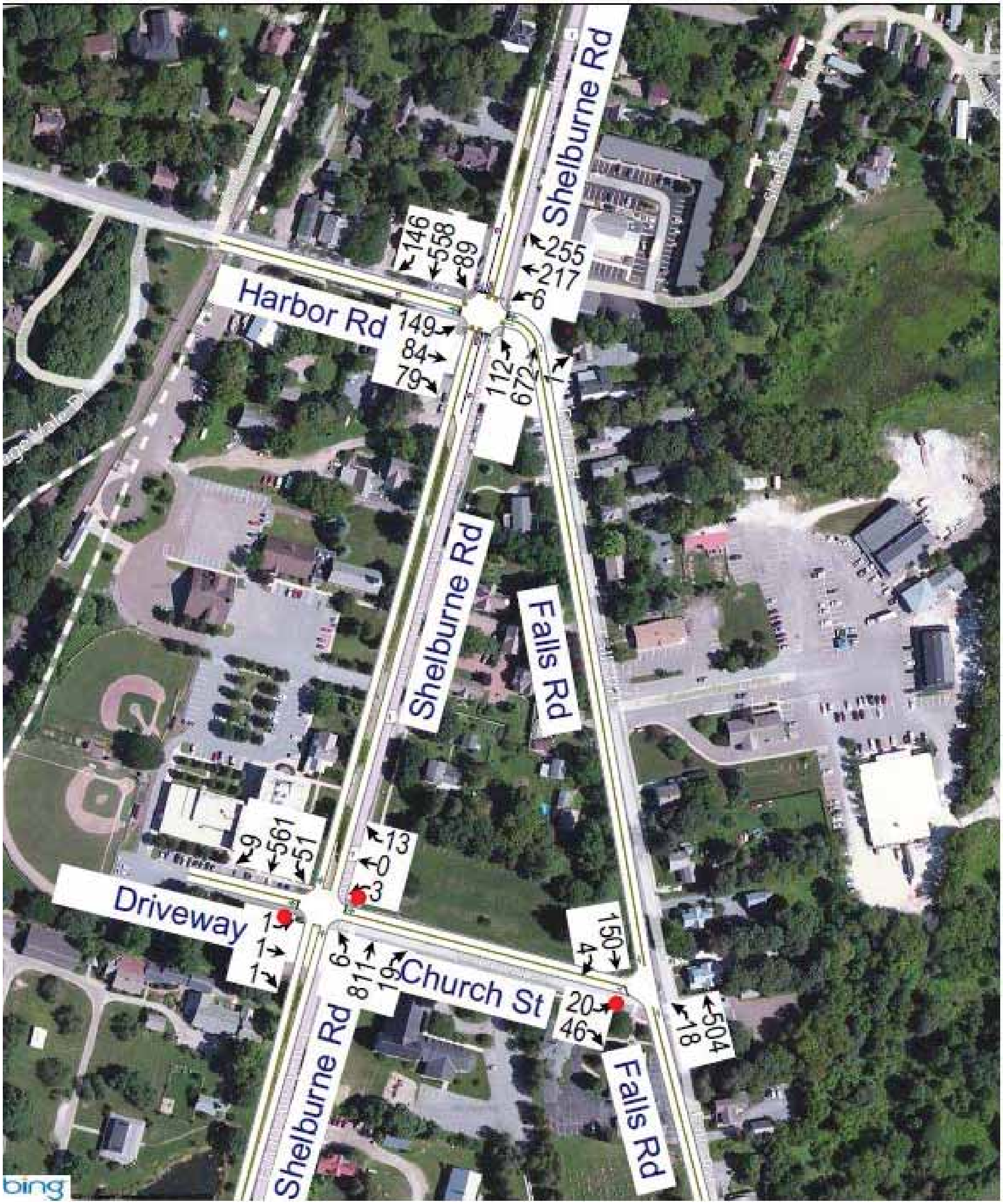


Figure 8: 2032 AM Peak Hour Traffic Flow

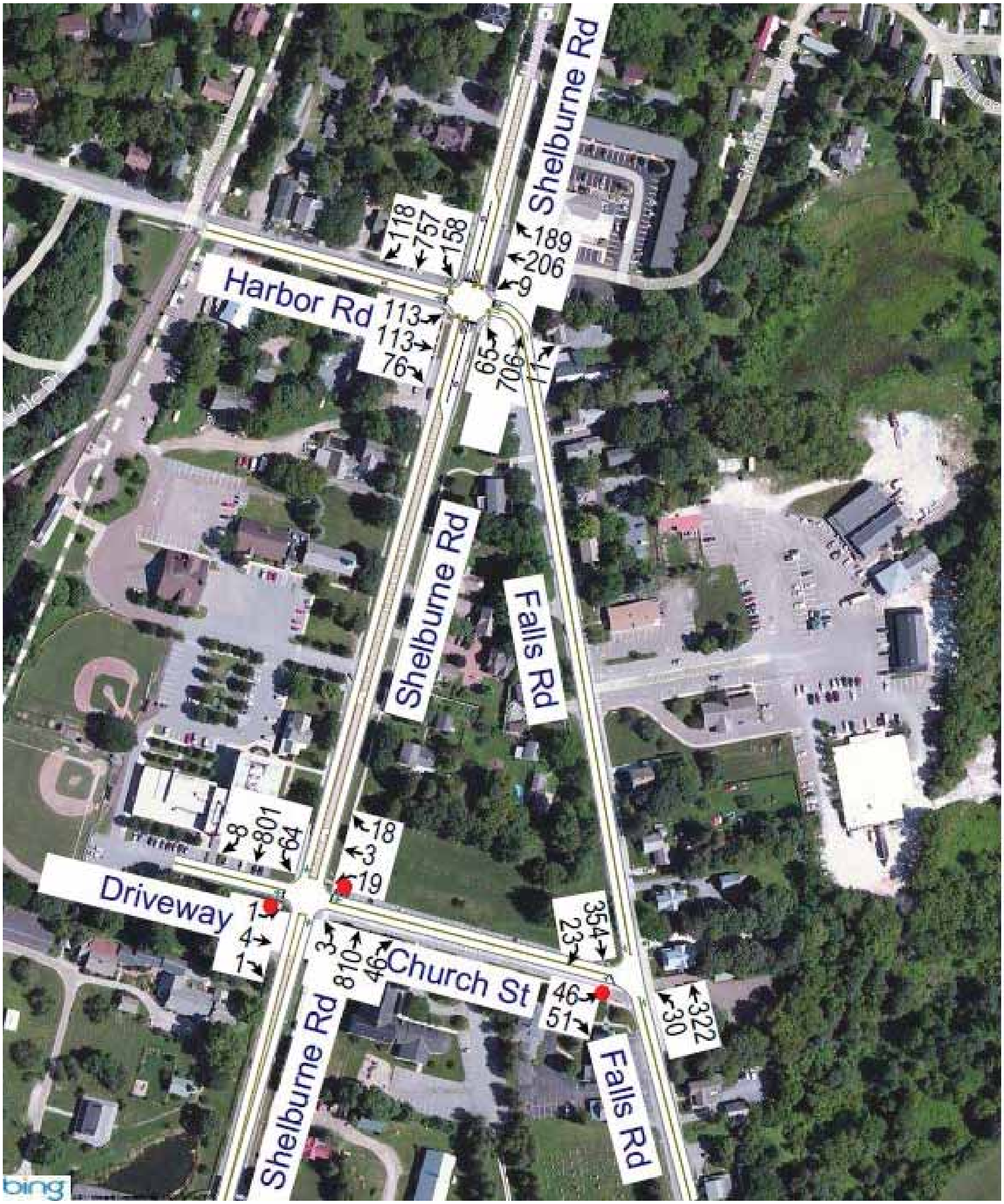


Figure 9: 2032 PM Peak Hour Traffic Flow

6.3 Future Traffic Operations

The traffic operations analysis conducted for existing traffic conditions were repeated for the future conditions. As shown in Table 6 below, existing traffic congestion levels are expected to worsen at the US Route 7 / Harbor Road / Falls Road intersection as travel demands increase. Travel demands in 2032 are expected to exceed the intersection capacity by 12 and 21 percent in the AM and PM peak hours respectively. Long delays and vehicle queues are expected on all intersection approaches under these conditions.

Table 6: Future Traffic Volumes

		Existing (2012)			Future (2032)		
	Peak Hour	LOS[1]	Delay[2]	V/C[3]	LOS	Delay	V/C
Signalized Intersections							
Falls Road/Harbor Road/Route 7							
	AM	E	78.2	1.03	F	111.9	1.12
	PM	F	80.4	1.06	F	125.3	1.21
Unsignalized Intersections							
Church Street/Route 7							
	AM	D	30	0.02	E	43.8	0.03
	PM	F	61.9	0.36	F	267.6	0.94
Church Street/Falls Road							
	AM	B	10.7	0.09	B	11.1	0.10
	PM	B	13.0	0.16	B	14.2	0.20

Notes: *Results shown are for the worst operating minor street approach for unsignalized intersections* .
[1] LOS= Level of Service
[2] Delay = Average delay expressed in seconds per vehicle
[3] V/C = Volume-to-capacity ratio for critical movements

7.0 Alternatives

The project committee considered a wide range of transportation system improvements to address the project's purpose and need. Recognizing that this scoping study is intended to define system improvements that can be constructed in the near term, certain strategies have received greater attention than others in this study. Longer range strategies and strategies that do not require physical changes to the transportation system are first described below. This overview of longer range improvements is followed by a more rigorous investigation of transportation system improvements that could be constructed in the near future, subject to town and state approval.

7.1 Ongoing and Long-Range Strategies

The ongoing and long-range strategies considered by the project team and described below include Transportation Demand Management, the construction of grid streets west of the US Route 7 / Harbor Road / Falls Road intersection, widening Route 7, and a modern roundabout.

7.1.1 Transportation Demand Management

Transportation Demand Management (TDM) is the application of strategies and policies to reduce travel demand (typically single occupant vehicle trips) or to redistribute this demand in space or time. A variety of TDM strategies that promote walking, biking, carpooling, using public transit, vanpooling, working from home, and compressed work hours can reduce the number of single occupant vehicles (SOV) on the road at peak times. Much has and is being done locally and regionally on this front. For example, in recent years the local transit system (CCTA) has expanded both routes and ridership. Among the service additions is the Burlington/Middlebury Link Express, which provides a convenient alternative for commuters. The CCRPC and VTrans have and continue to work with communities on education, park and ride facilities, ride share programs, transit promotions, complete streets, and Safe Routes to School programs.

The Town of Shelburne and the Shelburne Community School have made strides along this front as well. Pedestrian and bike facilities have been expanded in recent years, in part through the Safe Routes to School program, and new land use policies have been adopted to promote more dense urban development. The efforts have led to more residents and students walking and biking to school, work, and businesses in the village area.

It is anticipated these local and regional programs will grow and expand over the years; however these programs may not fully address the intersection's congestion issues. Non-automobile trips still comprise a very small percentage of total travel demands in non-urban areas. In addition, the accommodation of pedestrian movements at the subject intersection has an impact on the intersection's capacity to move vehicular traffic. Still, TDM programs are a vital component of the overall solution for the intersection and may be worth pursuing for other reasons such as reduced fuel consumption and carbon emissions.

7.1.2 Grid Streets

The development of village grid streets had been discussed and mentioned in previous planning studies. Project committee discussions recognized that these would have had value by reducing certain turning movements and congestion at the US Route 7 / Harbor Road / Falls Road intersection. Construction of new roadway links in the southwest and northwest quadrants of the intersection for example (potential alignments are shown in Figure10), would reduce traffic volumes turning into and out of Harbor Road at US Route 7. However, there are many challenges associated with their development such as right-of-way acquisition, new railroad crossings and displacement of existing land uses suggesting that creating a network of grid streets is not a readily implementable solution. Consequently, their development should be considered for the long term planning of the village.

Vermont State Statutes allow municipalities to create Official Town Maps that help to direct their growth in ways that are compatible with their plans and goals. See: http://www.leg.state.vt.us/statutes/fullsection.cfm?Title=24&Chapter=117&Section=04421. The Official Town Map can, among other things, note the location of proposed future roads. As long as the land designated for future use as a roadway is not proposed for development, the Town need not take action to acquire the land. However, as the State Statutes indicate, the Town can deny a request to develop the land based on the fact that it is designated as a future Town road, but must then move within 120 days to begin public acquisition of the parcel with just compensation to the land owner. If the Town declines to pursue ownership within this time period, then the land can be developed as originally intended by the landowner. The use of an Official Map could be useful in encouraging the development of the grid streets adjacent to the US Route 7 corridor.

As noted above, the Town is currently examining the possible benefits and impacts associated with the development of a north-south road east of US Route 7 between the Shelburne Shopping Park and Harrington Village residential development. A traffic analysis conducted for this road was completed by Stantec in January 2013. This investigation found that the Road would not be effective as a bypass of the US Route 7 / Harbor Road / Falls Road intersection and would not divert significant existing traffic volumes away from the intersection. However, it would provide access to parcels in the village that might otherwise be inaccessible and non-buildable. The Road will allow new development to occur in the village without adding to traffic demands at the US Route 7 / Harbor Road / Falls Road intersection.

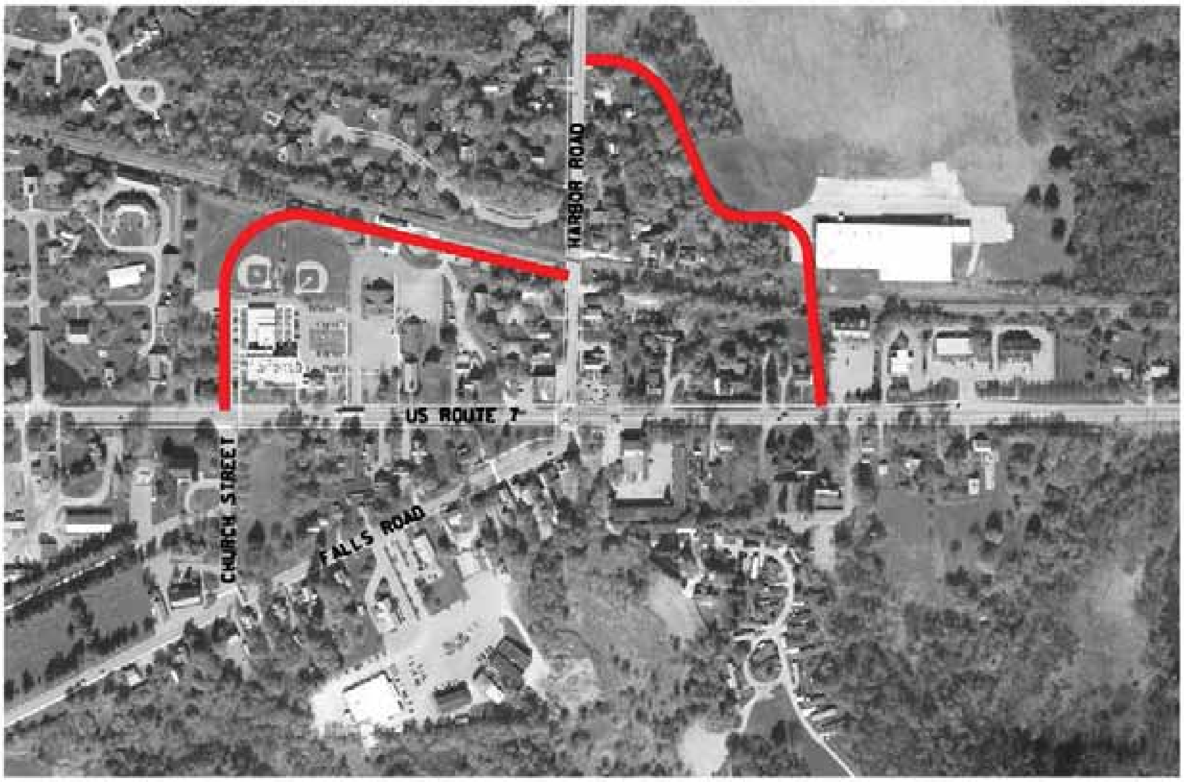


Figure 10: Potential Grid Street Alignments

7.1.3 Widening Route 7

Approximately one mile north of the subject intersection, US Route 7 was widened to a five-lane, median-divided roadway. This roadway cross section provides significant more traffic capacity than the three-lane section that exists in Shelburne Village at Falls Road and Harbor Road. A widening of US Route 7 to a five-lane section in the Village Center would certainly provide sufficient capacity to accommodate existing vehicular travel demands as well as substantial future growth in traffic volumes. However, such a change is inconsistent with the Town's Comprehensive Plan and the project Purpose and Need, as it would negatively impact village character and pedestrian circulation.

7.1.4 Modern Roundabout

Construction of a modern roundabout to replace the signalized US Route 7 / Harbor Road / Falls Road intersection was also considered. The benefits of a modern roundabout often include the following: traffic safety, operation performance, traffic calming, pedestrian safety, aesthetics, and maintenance. A roundabout capacity analysis, using HCM methodology, indicated a single lane roundabout would have similar capacity as the existing intersection and not provide sufficient capacity to serve projected future travel demands. A larger, two-lane roundabout with an outside diameter of 150 feet or greater would provide sufficient vehicular carrying capacity. Challenges to accommodating a roundabout at this location include the surrounding historic district and its resources; the closeness of existing buildings, businesses, accesses and parking; and the skewed approach alignment of Falls Road.

Anticipating the two-lane roundabout would have significant impacts, the footprint of a 100-foot diameter single-lane roundabout was reviewed with Scott Newman, VTrans Historic Preservation Officer. He indicated the single-lane roundabout option reviewed has Section 106 and Section 4(f) impacts that preclude it from being advanced as an alternative in this project. Scott's comments are as follows and can be found in Appendix B:

> The Section 106 finding for the roundabout would be an Adverse Effect due to the loss/conversion of significant green space within the historic district to transportation use. Section 106 would require that stakeholders consult to evaluate avoidance alternatives, and would ultimately support the intersection modification plan generated through our consultation on-site that avoids an adverse effect.
>
> Section 4(f) would require that we evaluate alternatives to the conversion of protected property resulting from the roundabout construction, therein demonstrate that no prudent and feasible alternatives to avoid the adverse effect exist, and finally, require that we advance the least harmful alternative that meets the project purpose and need. Because modifying the intersection and using Intelligent Transportation Systems (ITS) appears to be a prudent and feasible alternative that avoids adverse effects while meeting the project purpose and need, the roundabout option that you provided could not be advanced. However, the "footprint" of the roundabout, if constructed, would have significant impacts on the adjacent parcels including historic resources.

The above statement references ITS. The ITS component of this project is the operations of the traffic signal.

The project committee did discuss the possibly of locating the roundabout further north and avoiding or minimizing impacts to green space. However a more northerly location would require realignment of Falls Road and Harbor Road. This would have impacts to the Shelburne Inn and Mobil Station properties outside the existing highway right-of-way (ROW). Specific impacts include modifying existing accesses and reductions to the northeast corner green space. For the aforementioned reasons an alternative roundabout location was not pursed further.

7.2 Active Strategies

Several structural, short-range strategies to improve traffic conditions at the US Route 7 / Harbor Road / Falls Road intersection were recommended for more detailed consideration by the steering committee. These strategies include:

- Strategy 1 – Intersection Upgrades Only
- Strategy 2 – One-Way Falls Road with Intersection Upgrades
- Strategy 3 – Right Turns Only from Falls Road with Intersection Upgrades
- Strategy 4 – Intersection Upgrades Without US Route 7 Southbound Right-Turn Lane

Strategy 1 includes intersection upgrades consisting of adding a dedicated left-turn lane on Harbor Road, adding a right-turn lane on US Route 7 southbound, and extending the existing left-turn lanes on US Route 7. All of these changes are compatible with the circulation changes proposed in Strategies 2 and 3 and consequently have been included in these strategies. Each strategy is described in greater detail below.

7.2.1 Strategy 1 – Intersection Upgrades

This strategy maintains the existing traffic circulation patterns in the village, contributes to a complete street concept, and provides additional vehicle carrying capacity at the US Route 7 / Harbor Road / Falls Road intersection by adding and extending turn lanes. New turn lanes are proposed where there is sufficient traffic demand to justify their consideration. Specific changes include:

- Creating a complete street concept with bicycle shoulders, curbing, sidewalks, street trees, street lighting, parking strips, on-street parking, and small curb radii.
- Extending the northbound and southbound left-turn lanes on US Route 7 to 400 feet.
- Adding a second lane on the Harbor Road approach to provide a shared through/right-turn lane and a dedicated left-turn lane.
- Adding a US Route 7 southbound right-turn lane.
- Extending the right-turn lane on the Falls Road westbound approach to 150 feet.

A more detailed description of the proposed improvements is provided below along with an assessment of the strategy's anticipated impact intersection operations.

Detailed Description

The various components of Strategy 1are illustrated in the attached conceptual improvement plan and include the following:

- **Contribute to a Complete Street concept.** Proposed elements consistent with "complete streets" include extending sidewalks and bike lanes/shoulders where missing; providing curbing, planting strips, street trees and street lighting to separate pedestrians from vehicles; minimizing curb radii to accommodate buses but not large trucks; and install on-street parking. See Figures 11 and 12 on page 40 and 41 respectively.
- **Extend the Northbound and Southbound left-turn lanes on US Route 7.** These lanes would be extended to 400 feet to enable left-turning traffic access to these lanes while US Route 7 through traffic is queued in the through lanes. The proposed turn lanes and the US Route 7 lanes are all 11 feet wide. A four-foot shoulder is proposed. The widening to accommodate the longer lanes varies from 2 to 10 feet and occurs primarily on the west side of the roadway. A minimum five-foot green strip is provided between the sidewalk and edge of shoulder. This widening will necessitate a new underground drainage system. To allow for this green strip to include roadside hazards such as trees, street lighting, and utility poles, a vertical

curb is required. Typical sections, north and south of the intersection, are shown on the following page in Figures 11 and 12.

- **Add an exclusive left-turn lane on Harbor Road and enhanced bike accommodations.** This would create an eastbound shared through and right-turn lane, an exclusive eastbound left-turn lane, and one westbound lane on Harbor Road at the intersection. The proposed three 11-foot travel lanes and two 4-foot wide shoulders, which match the existing lane and shoulder widths on Harbor Road, would extend 200 feet west along Harbor Road from US Route 7 and then transition to the existing 30-foot roadway width over 100 feet. A five-foot wide sidewalk is maintained on both sides of Harbor Road. This widening impacts the seven existing 90-degree parking spaces on the south side of the road. To replace these spaces, eight-foot wide parallel parking is proposed with six spaces provided. This construction requires the removal of several small trees in the existing green strip between Harbor Road and the sidewalk on the north and south sides of the roadway. It would also require land/right-of-way (ROW) acquisition or easements from two properties on the south side. (Note: Based on discussions with Scott Newman, VTrans Historic Preservation Officer, the removal of these trees and green strip between the sidewalk and curb is considered an adverse effect on historic resources. An alternative to the proposed lane and shoulder widths and removal of three proposed parking spaces was discussed among the project committee members and Scott Newman. The minimum lane width allowed by VSS is 10 feet with a minimum 2-foot shoulder for curbed lanes. Using these minimums, the combined width of the three lanes is reduced from 41 feet to 34 feet. In this area, westbound bicycles would share the 12-foot curb lane with vehicles and eastbound bicycles would assume a travel lane. The narrowing of lanes and removal of parking spaces will have a minor effect on traffic capacity, preserve more of the existing landscape, reduce the ROW acquisitions needed and replace the planted buffer space between the curb and sidewalk. These revisions are carried forward in Strategy 4.)

- **Add a US Route 7 southbound right-turn lane.** This proposed lane is approximately 400 feet long. This length is greater than what is required to store vehicles waiting to turn right at the intersection. The extra length allows right-turning vehicles access to the lane when it might otherwise be blocked by US Route 7 southbound vehicles queued in the through travel lane. This right-turn lane is 12 feet wide and bordered by a vertical curb and a replacement five-foot wide sidewalk. (There is presently no curbing in this area on US Route 7 southbound and the existing sidewalk is separated from the roadway by a 10-foot wide green strip.) A four-foot wide bike lane to accommodate through bicycles separates the right-turn lane and the US Route 7 southbound through lane. The new west side sidewalk location varies from two to five feet behind the existing sidewalk and is within the existing highway ROW. Two utility poles need to be relocated to behind the proposed sidewalk. The new sidewalk does not impact the existing parking at the northwest corner service station. This lane addition does widen the intersection’s northern crosswalk from 37 feet to 48 feet. It also provides an adverse effect on the historic resources.

- **Upgrade the signal at the US Route 7 / Falls Road / Harbor Road Intersection.** This consists of new mast arms, relocated pedestrian signals, and enabling of a potential future upgrade to adaptive signal control to optimize signal operations. New signal heads would be provided on the Harbor Road approach to inform drivers that the left-turn movement is a "protected" movement, that is, there is no opposing traffic from Falls Road crossing the path of left-turning vehicles during the left-turn signal phase.
- **Extend the thru/left and right-turn lanes along Falls Road.** This element of the strategy would formalize these lanes and provide the ability for more right-turning vehicles to access the intersection without being blocked by thru/left-turn lane vehicles. It would at least for the present time maintain the parking in front on the Shelburne Country Store.
- **Increase the curb radius on the Falls Road approach.** An increase in curb radius would allow vehicles to more readily turn right and have less encroachment on the US Route 7 left-turn lane. The increased curb radius does not require additional utility pole relocation but does increase the pedestrian crossing distance on the Falls Road approach by approximately six feet.

Figure 11: Typical Section Station 99+00

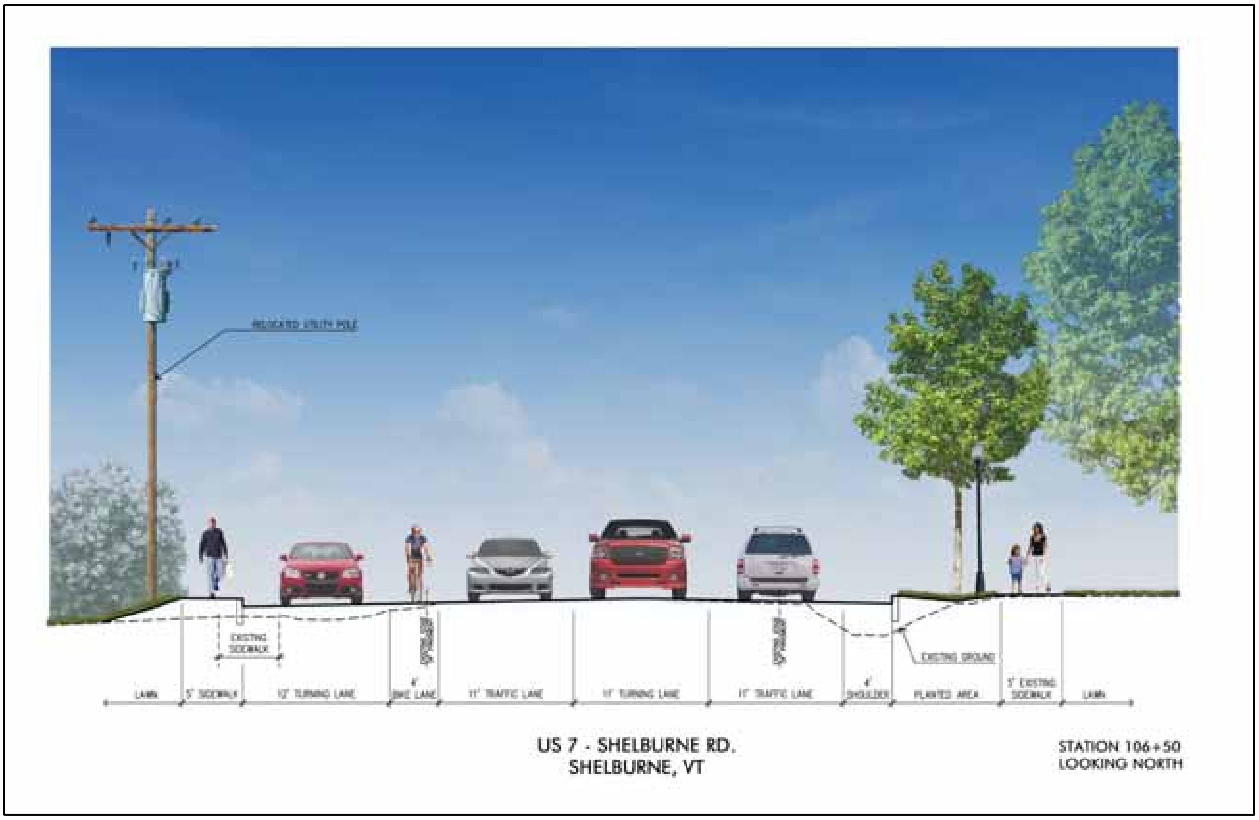


Figure 12: Typical Section Station 106+50

Operational Impacts

The capacity analysis results for the US7/Harbor Road/Falls Road intersection assuming implementation of Strategy 1 indicates that Strategy 1 will result in significant improvements in peak hour operations under projected 2032 traffic conditions. As shown in Table 7, intersection operations improve from Level of Service (LOS) F to LOS C during the PM peak hour. The PM peak hour volume-to-capacity (V/C) ratio, projected to be 1.21 in 2032 assuming no improvements are made, decreases to 0.88. Consequently, motorists will not be exposed to the extensive queues and delays associated with an intersection experiencing traffic demands that are 21 percent greater than the intersection's capacity. The improved capacity will be greater than that of the anticipated travel demand under Strategy 1. The projected future V/C ratios will actually be lower than those calculated for existing conditions

Table 7: US Route 7 / Harbor Road / Falls Road Intersection Performance with Strategy 1

	Existing (2012)			Future (2032)			Future with Strategy 1		
Peak Hour	LOS[1]	Delay[2]	V/C[3]	LOS	Delay	V/C	LOS	Delay	V/C
AM	E	78.2	1.03	F	111.9	1.12	D	46.3	0.85
PM	F	80.4	1.06	F	125.3	1.21	C	34.2	0.88

Notes: [1] *LOS= Level of Service*
[2] Delay = Average delay expressed in seconds per vehicle
[3] V/C = Volume-to-capacity ratio for critical movements

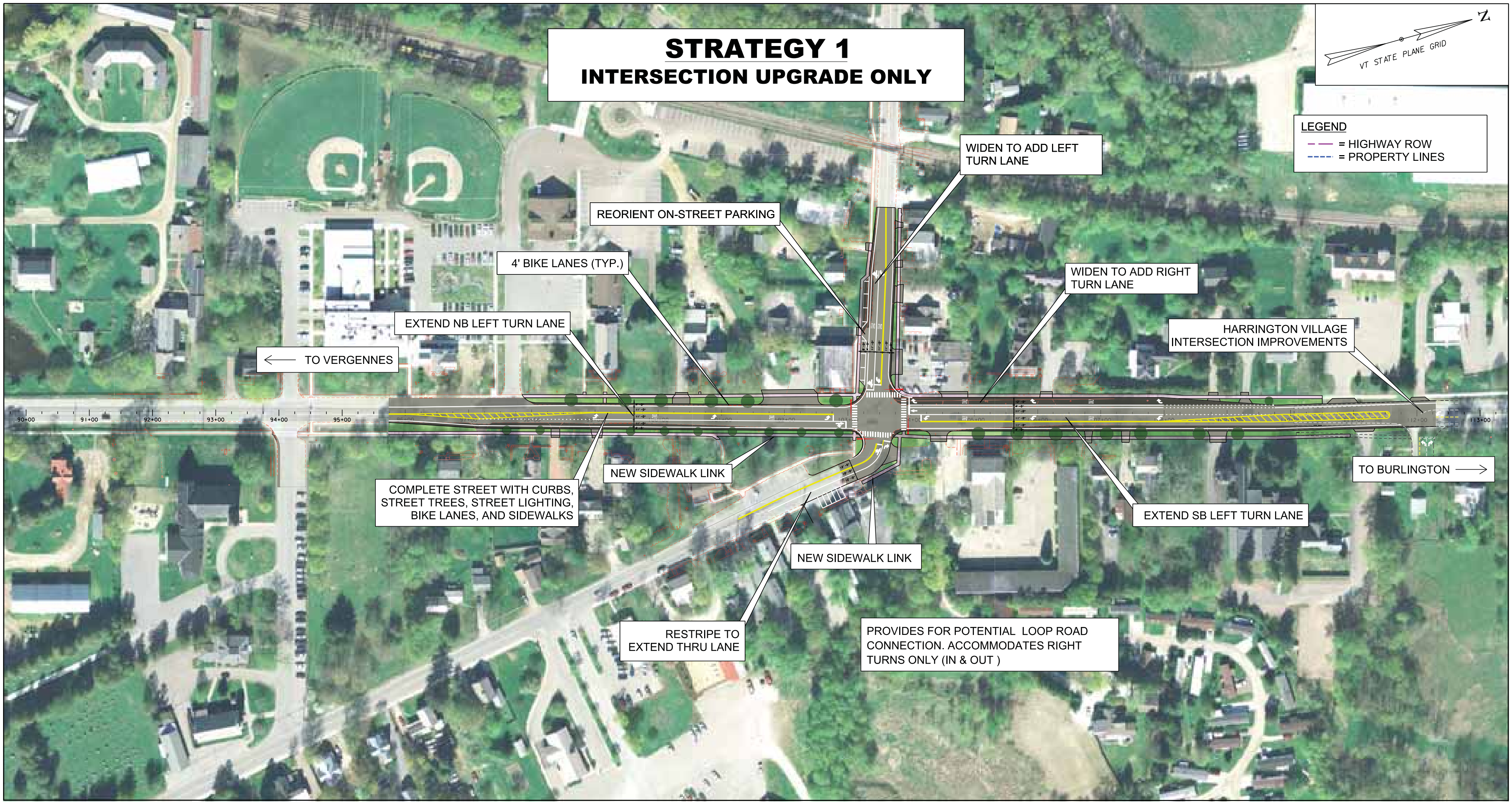
Variations

The principal capacity enhancing elements of Strategy 1 can be implemented independently. Of course, elimination of any one element from the strategy would reduce the performance benefits associated with Strategy 1. Table 8 provides volume-to-capacity ratios for the intersection under 2032 peak hour conditions assuming that individual elements of the strategy are eliminated. This analysis demonstrates that the most significant performance benefits are associated with the lane addition on Harbor Road. Extending the right-turn lane on Falls Road and adding a right-turn lane to Route 7 southbound offer lesser benefits.

Table 8: US Route 7 / Falls Road / Harbor Road Intersection Performance with Modifications to Strategy 1

	Peak Hour Volume-to-Capacity Ratios					
		Future (2032)				
Peak Hour	Existing	With No Improvement	With Strategy 1	Strategy 1 w/o Added Lane on Harbor Road	Strategy 1 w/o Extended Right-turn Lane on Falls Road	Strategy 1 w/o Added Southbound Right-turn Lane on Route 7
AM	1.03	1.12	0.85	1.05	1.05	0.92
PM	1.06	1.21	0.88	1.09	0.98	0.99

Strategy 1 also includes a proposal to extend left-turn lanes on Route 7 from 100 feet to 400 feet. Under existing conditions left-turning vehicles are often blocked from entering the left-turn lanes by long vehicle queues in the through travel lanes. As such, the signal green time available to left-turn movements may not be fully utilized. Similarly, as vehicles exit the through lanes to enter the left-turn lanes just a short distance from the intersection, they leave a gap in the through traffic queue. This too reduces the efficiency of intersection operations. However, the traffic analysis tool used above to evaluate the performance improvements associated with various elements of Strategy 1, Synchro, does not explicitly model the benefits of extended turn lanes. Consequently, in order to evaluate the benefits of the proposed extension of left-turn lanes on Route 7 the micro simulation software SimTraffic was used. SimTraffic simulates traffic operations under various assumed design conditions and tracks the performance of individual vehicles passing through the intersection. Random number “seeds” are used to begin each simulation exercise making each simulation unique. An experiment was conducted where 45 simulation runs were completed with the 100-foot turn lanes and with the 400-foot turn lanes. A comparison of the results showed that extending the turn lanes reduced travel delays at the intersection by approximately six percent and increased throughput for northbound and southbound through movements by approximately four percent.


STRATEGY 1
INTERSECTION UPGRADE ONLY
VT STATE PLANE GRID
N
LEGEND
= HIGHWAY ROW
= PROPERTY LINES
WIDEN TO ADD LEFT TURN LANE
REORIENT ON-STREET PARKING
4' BIKE LANES (TYP.)
WIDEN TO ADD RIGHT TURN LANE
HARRINGTON VILLAGE INTERSECTION IMPROVEMENTS
EXTEND NB LEFT TURN LANE
TO VERGENNES
TO BURLINGTON
NEW SIDEWALK LINK
COMPLETE STREET WITH CURBS, STREET TREES, STREET LIGHTING, BIKE LANES, AND SIDEWALKS
EXTEND SB LEFT TURN LANE
NEW SIDEWALK LINK
RESTRIPE TO EXTEND THRU LANE
PROVIDES FOR POTENTIAL LOOP ROAD CONNECTION. ACCOMMODATES RIGHT TURNS ONLY (IN & OUT)

7.2.2 Strategy 2 - One-Way Falls Road with Intersection Upgrades

Strategy 2 has many of the same improvements as Strategy 1 but proposes to make Falls Road one way eastbound from US Route 7 to the Shelburne Shopping Park driveway. It requires westbound Falls Road traffic and westbound Shelburne Shopping Center traffic to use Church Street westbound and then turn right on US Route 7 northbound. This strategy would increase the capacity of the US Route 7 / Harbor Road / Falls Road intersection by redistributing traffic through the intersection.

The traffic capacity benefits would be realized from two factors. First, removing all flow from the westbound Falls Road approach eliminates the Falls Road signal phase and the inefficiencies associated with provision of this phase. Specifically, "lost time" related to vehicles starting from a stopped condition at the beginning of the signal green interval and related to clearing the intersection during the yellow interval, would be recovered and made available to the other intersection approaches. Second, the reassigned traffic volumes would generally be added to "non-critical" movements in the intersection where it would have less of an impact on overall intersection operations than it would if processed from the Falls Road westbound approach. For example, left turns into Harbor Road from US Route 7 northbound can operate concurrently with left turns into Falls Road from US Route 7 southbound. Under existing conditions traffic cannot enter Harbor Road from Falls Road while traffic is simultaneously turning left into Falls Road from US Route 7 southbound.

Strategy 2 also reduces the Falls Road traffic and needed roadway width. This change provides an opportunity to create a more pedestrian friendly street design with narrower roadway, on street parking, and greater space for street trees and pedestrian amenities. The Falls Road / Church Street intersection would remain unchanged except the northwest corner curb radii would be increased to accommodate turning buses and trucks. The US Route 7 / Church Street intersection would require a the installation of a traffic signal.

Detailed Description

This strategy proposes to make Falls Road one way eastbound from US Route 7 to the Shelburne Shopping Park driveway. In order to implement this change "Do Not Enter" signs would be posted on Falls Road just west of the Shelburne Shopping Park. Likewise, route guide signs would be needed on Falls Road prior to Church Street directing traffic to US Route 7 via Church Street. This change allows for additional parallel parking along Falls Road and extending the east side sidewalk to the US Route 7 intersection as shown in the attached plan. Implementation of this plan would also require changes away from the US Route 7 / Harbor Road / Falls Road intersection to accommodate redirected traffic flows. These changes are also shown on the attached plan and include:

- **Install a signal at the US Route 7 / Church Street Intersection**. With the increased Church Street traffic volumes due to the one-way Falls Road operation, a signal will be warranted at the US Route 7 / Church Street intersection**.** (The signal warrant analysis is included in Appendix F.) This signal would also control the southern entrance to the municipal complex located opposite Church Street. The signal would be coordinated with the US Route 7 / Harbor Road / Falls Road signal to promote traffic progression along US Route 7 and manage vehicle queuing between intersections. The signal would include a pedestrian phase and could include a median/refuge island on the US Route 7 northbound approach.

- **Add a left-turn lane on the US Route 7 southbound approach to US Route 7 / Church Street intersection.** This 11-foot lane extends approximately 200 feet northward and creates a three lane section along US Route 7 to the Harbor Road / Falls Road intersection. This allows for left turns onto Church Street without delaying US Route 7 southbound traffic.

For analysis purposes it is also assumed that this strategy includes certain elements of Strategy 1 proposed for the US Route 7 / Harbor Road / Falls Road intersection. These include:

- Extending the northbound and southbound left-turn lanes on US Route 7.
- Adding a second lane to the Harbor Road approach.
- Adding a US Route 7 southbound right-turn lane.
- Upgrading the signal with new mast arms, relocated pedestrian signals and possible implementation of adaptive signal control for real-time signal optimization.

Again, not all of these elements would need to be constructed as part of the final plan. However, constructing all elements will yield the greatest capacity enhancements.

Operational Impacts

The Strategy 2 capacity analysis results for the US Route 7 / Harbor Road / Falls Road intersection indicate there will be significant operational improvements for future peak hour conditions. As shown in the table below, future intersection operations improve from Level of Service (LOS) F to LOS D during both AM and PM peak hours. The PM peak hour volume-to-capacity (V/C) ratio, projected to be 1.21 in 2032 assuming no improvements are made, decreases to 0.83. The table also shows that the Church Street intersections with US Route 7 and Falls Road will be at LOS C or better.

Table 9: Existing Intersection Capacity Analysis Results

	Existing (2012)			Future (2032)			Future with Strategy 2		
Peak Hour	LOS[1]	Delay[2]	V/C[3]	LOS[1]	Delay[2]	V/C[3]	LOS[1]	Delay[2]	V/C[3]
SIGNALIZED INTERSECTIONS									
Falls Road/Harbor Road/Route 7									
AM	E	78.2	1.03	F	111.9	1.12	D	42.9	0.83
PM	F	80.4	1.06	F	125.3	1.21	D	36.5	0.83
Church Street/Route 7									
AM	D	30	0.02	E	43.8	0.03	C	23.1	0.86
PM	F	61.9	0.36	F	267.6	0.94	B	15.5	0.72
UNSIGNALIZED INTERSECTIONS									
Church Street/Falls Road									
AM	B	10.7	0.09	B	11.1	0.10	C	19.1	0.21
PM	B	13.0	0.16	B	14.2	0.20	C	24.6	0.36

Notes: Results shown are for the worst operating minor street approach for unsignalized intersections.
[1] LOS= Level of Service
[2] Delay = Average delay expressed in seconds per vehicle
[3] V/C = Volume-to-capacity ratio for critical movements


STRATEGY 2
ONE-WAY FALLS ROAD WITH INTERSECTION UPGRADE
VT STATE PLANE GRID
N
LEGEND
= HIGHWAY ROW
= PROPERTY LINES
WIDEN TO ADD LEFT TURN LANE
INSTALL TRAFFIC SIGNAL
CONSTRUCT MEDIAN ISLAND
TO VERGENNES
REORIENT ON-STREET PARKING
4' BIKE LANES/SHOULDERS (TYP.)
EXTEND LEFT TURN LANE
ADD LEFT TURN LANE
ADD RIGHT TURN LANE
HARRINGTON VILLAGE INTERSECTION IMPROVEMENTS
TO BURLINGTON
EXTEND SB LEFT TURN LANE
REMOVE PARKING 75' FROM INTERSECTION
COMPLETE STREET WITH CURBS, STREET TREES, STREET LIGHTING, BIKE LANES, AND SIDEWALKS
NEW SIDEWALK LINK
PROVIDES FOR POTENTIAL LOOP ROAD CONNECTION.
CONVERT FALLS ROAD TO ONE-WAY SOUTHBOUND TO SHOPPING PARK
PROHIBIT RIGHT TURNS FROM SHOPPING PARK
ADJUST INTERSECTION TO ACCOMADATE BUS AND TRUCK TRAFFIC

Variations

The above analysis results assume that there is no connection from the proposed Loop Road to Route 7 at Falls Road. No connection was assumed under Strategy 1 as such a connection would create a five-way intersection that could not be designed to operate more efficiently and more safely than the existing four-way intersection. However, a connection may be feasible under Strategy 2 with Falls Road restricted to one-way operation. Providing this connection would reintroduce an exclusive signal phase for the Falls Road/Loop Road Connector approach and slightly degrade intersection operations. As shown in Table 10, intersection performance is degraded under Strategy 2 with a Loop Road connection provided.

Table 10: US Route 7 / Harbor Road / Falls Road Intersection Performance for Strategy 2

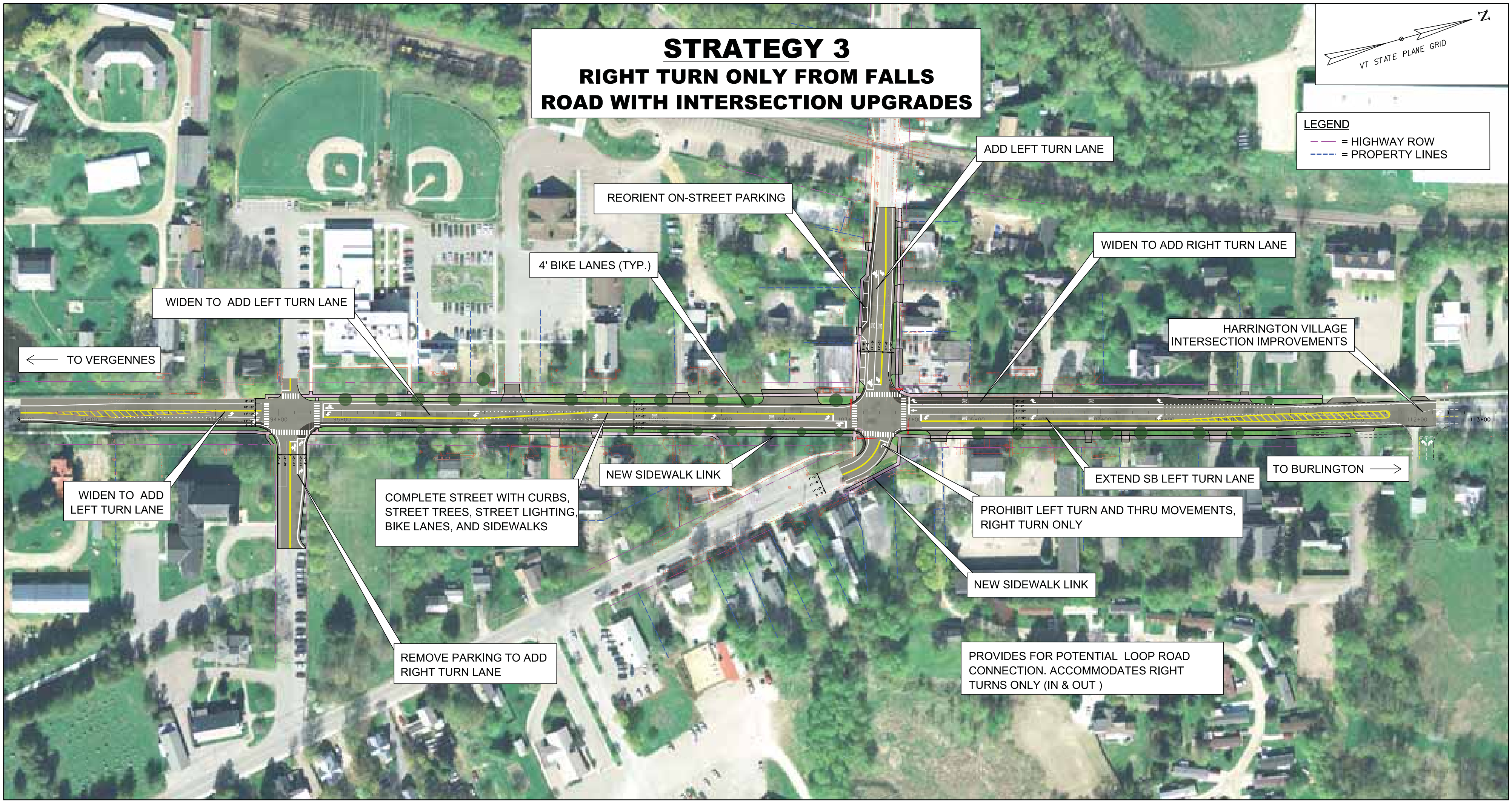
Peak Hour Volume-to-Capacity Ratios				
		Future 2032		
Peak Hour	Existing	With No Improvements	With Strategy 2	Strategy 2 with Loop Road Connection
AM	1.03	1.12	0.83	0.99
PM	1.06	1.21	0.83	0.98

7.2.3 Strategy 3 – Falls Road Right-Only with Intersection Upgrades

Strategy 3 achieves most of the operational efficiencies expected to be realized at the US Route 7 / Harbor Road / Falls Road intersection with Strategy 2 but with lesser impacts on existing traffic circulation patterns. Under Strategy 3 a signal phase can again be eliminated at the intersection by restricting movements from Falls Road to right turns only. The existing exclusive westbound Falls Road signal phase is eliminated along with the lost time associated with this phase. Right turns from Falls Road would be accommodated concurrently with left turns into Falls Road from US Route 7 southbound during the existing southbound left-turn phase. Through movements from Falls Road to Harbor Road would be redirected to Church Street westbound and US Route 7 northbound as assumed under Strategy 2. These added left turns to the US Route 7 northbound left-turn movement could also be accommodated during the southbound US Route 7 left-turn signal phase. The reassignments thereby allow the existing traffic demands to be accommodated more efficiently and with one fewer signal phase.

Detailed Description

This strategy proposes to restrict vehicle movements from Falls Road at US Route 7 to right turns only. In order to implement this change guide signs would be posted on the Shelburne Shopping Park driveway and Falls Road prior to Church Street directing traffic to Harbor Road via Church Street and Route 7. This change allows for the elimination of the through approach lane on Falls Road at Route 7 which may in turn create space to expand sidewalks in this area. Implementation of this plan would also require changes away from the US Route 7 / Harbor Road / Falls Road intersection to accommodate redirected traffic flows. These changes are shown on the attached plan and include:


STRATEGY 3
RIGHT TURN ONLY FROM FALLS
ROAD WITH INTERSECTION UPGRADES
N
VT STATE PLANE GRID
LEGEND
= HIGHWAY ROW
= PROPERTY LINES
ADD LEFT TURN LANE
REORIENT ON-STREET PARKING
WIDEN TO ADD RIGHT TURN LANE
4' BIKE LANES (TYP.)
WIDEN TO ADD LEFT TURN LANE
HARRINGTON VILLAGE
INTERSECTION IMPROVEMENTS
TO VERGENNES
TO BURLINGTON
NEW SIDEWALK LINK
EXTEND SB LEFT TURN LANE
WIDEN TO ADD
LEFT TURN LANE
COMPLETE STREET WITH CURBS,
STREET TREES, STREET LIGHTING,
BIKE LANES, AND SIDEWALKS
PROHIBIT LEFT TURN AND THRU MOVEMENTS,
RIGHT TURN ONLY
NEW SIDEWALK LINK
REMOVE PARKING TO ADD
RIGHT TURN LANE
PROVIDES FOR POTENTIAL LOOP ROAD
CONNECTION. ACCOMMODATES RIGHT
TURNS ONLY (IN & OUT)

- **Add a left-turn lane on the US Route 7 southbound approach to US Route 7 / Church Street intersection.** This 11-foot lane extends approximately 200 feet northward and creates a three lane section along US Route 7 to the Harbor Road / Falls Road intersection. This allows for left turns onto Church Street without delaying US Route 7 southbound traffic.

For analysis purposes it is also assumed that this strategy includes certain elements of Strategy 1 proposed for the US Route 7 / Falls Road / Harbor Road intersection. These include:

- Adding a second lane to the Harbor Road approach.
- Adding a US Route 7 southbound right-turn lane.
- Extending the northbound and southbound left-turn lanes on US Route 7.
- Upgrading the signal with new mast arms, relocated pedestrian signals and possible implementation of adaptive signal control for real-time signal optimization.

Again, not all of these elements would need to be constructed as part of the final plan. However, constructing all elements will yield the greatest capacity enhancements.

Operational Impacts

The Strategy 3 future capacity analysis results for the US Route 7 / Harbor Road / Falls Road intersection indicate significant operational improvements. As shown in the table below, intersection operations improve from LOS F to LOS D during the PM peak hour. The PM peak hour volume-to-capacity (V/C) ratio, projected to be 1.21 in 2032 assuming no improvements are made, decreases to 0.89. The table also shows that the Church Street intersections with US Route 7 and Falls Road will be at LOS C or better. Left turns from Church Street onto US Route 7 will continue to operate at LOS F with Strategy 3 as they do under existing conditions. Right turns onto US Route 7 from Church Street, which will include traffic destined to Harbor Road, will operate at LOS D or better.

Table 11: US Route 7 / Harbor Road / Falls Road Intersection Performance for Strategy 3

		Existing (2012)			Future (2032)			Future with Strategy 3		
	Peak Hour	LOS[1]	Delay[2]	V/C[3]	LOS[1]	Delay[2]	V/C[3]	LOS[1]	Delay[2]	V/C[3]
SIGNALIZED INTERSECTIONS										
US Route 7 / Falls Road / Harbor Road										
	AM	E	78.2	1.03	F	111.9	1.12	D	47.7	0.87
	PM	F	80.4	1.06	F	125.3	1.21	D	37.1	0.89
UNSIGNALIZED INTERSECTIONS										
US Route 7 / Church Street										
Church Street Left and Through	AM	D	30	0.02	E	43.8	0.03	F	78.3	0.26
	PM	F	61.9	0.36	F	267.6	0.94	F	661	1.63
Church Street Right Turns								D	27.4	0.59
								D	27.3	0.57
Church Street/Falls Road										
	AM	B	10.7	0.09	B	11.1	0.10	B	13.1	0.13
	PM	B	13.0	0.16	B	14.2	0.20	C	18.6	0.27

Notes: Results shown are for the worst operating minor street approach for unsignalized intersections.
[1] LOS= Level of Service
[2] Delay = Average delay expressed in seconds per vehicle
[3] V/C = Volume-to-capacity ratio for critical movements

7.2.4 Strategy 4 – Intersection Upgrades without US Route 7 Southbound Right-Turn Lane

Strategy 4 is a modified version of Strategy 1, but it also incorporates and makes additions to the pedestrian and traffic calming elements of Strategy 2 at the US Route 7 / Church Street intersection. It is the result of stakeholder input, and project committee discussions with the VTrans Historic Preservation Officer. It removes the previously proposed US Route 7 southbound right-turn lane and maintains a 3-lane section on US Route 7. Strategy 4 offers the following benefits when compared to Strategy 1:

- Reduces the roadway width on the southbound approach by 12 feet and consequently reduces the crosswalk distance
- Maintains the west side sidewalk location and alignment
- Provides a planting strip between the curb and sidewalk for street trees, lighting, and pedestrian comfort.
- Eliminates the need to relocate some of the aerial utilities
- Reduces impacts to the historic district and the Spillane’s service station operations
- Provides pedestrian and traffic calming benefits at the US Route 7 / Harbor Road intersection through refuge islands in the center of the roadway

This strategy also incorporates the narrower Harbor Road that was mentioned as an option in Strategy 1. The narrower width of 12-foot curb lanes and 10-foot turn lane requires bicycles share the road with vehicles in the area of the intersection. Through discussions with the VTrans Historic Preservation Officer it was learned the three most western proposed parallel parking spaces along the south side of Harbor Road were problematic due to the necessary removal of green space and trees. This is considered an adverse effect to historic resources. Strategy 4 removes the three most western spaces and retains the three spaces closest to the intersection. Also, the narrower Harbor Road allows the southside curb line to shift northward so the space between the brick structure and the parallel parking widens to 18 feet or more. This provides an opportunity to create a public-private space that could be used to enhance the village charm. The south side sidewalk on Harbor Road is able to shift northward by about four feet while retaining an existing large tree and replacing the existing four-foot green buffer strip between the sidewalk and curb. This enables Strategy 4 to avoid an adverse effect on historic resources.

This strategy does retain the following features of Strategy 1:

- Creating a Complete Street concept.
- Extending the northbound and southbound left-turn lanes on US Route 7.
- Adding a second lane to the Harbor Road approach.
- Upgrading the signal with new mast arms.
- Reconfiguring the parking on Harbor Road.

Operational Impacts

The capacity analysis results indicate Strategy 4 provides an improvement in peak hour conditions under projected 2032 traffic conditions. As shown in the table below, during the PM Peak hour, intersection operations improve from LOS F to LOS D and the V/C ratio decreases from 1.21 to 0.99. Although this improvement is not as significant as Strategy 1, the removal of the US Route 7 southbound right-turn lane has the least benefit to the intersection operations when compared to the improvements on Harbor Road and Falls Road.

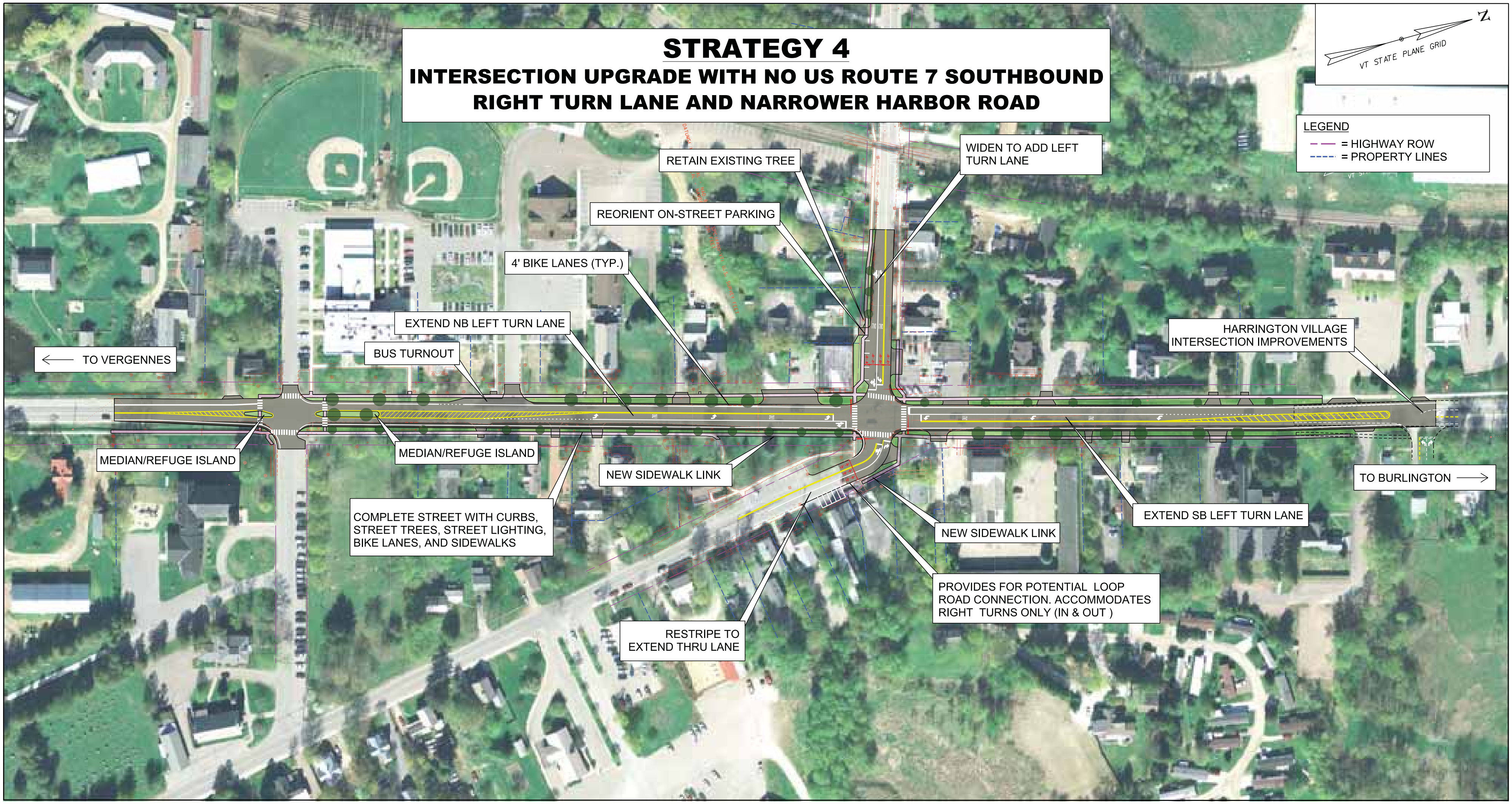
Table 12: US Route 7 / Falls Road / Harbor Road Intersection Performance with Strategy 4

	Existing (2012)			Future (2032)			Future with Strategy 4		
Peak Hour	LOS[1]	Delay[2]	V/C[3]	LOS	Delay	V/C	LOS	Delay	V/C
AM	E	78.2	1.03	F	111.9	1.12	E	55.4	0.92
PM	F	80.4	1.06	F	125.3	1.21	D	47.3	0.99

Notes: Results shown are for the worst operating minor street approach for unsignalized intersections.
1 LOS= Level of Service
2 Delay = Average delay expressed in seconds per vehicle
3 V/C = Volume-to-capacity ratio for critical movements

Harbor Road Parking Variations

The proposed parallel parking on Harbor Road results in a loss of parking spaces. This was an expressed concern during the public process and it was requested that diagonal parking be considered to provide additional spaces. A plan of drive-in angle parking is shown in Figure 17. Its layout is restricted by the adjacent crosswalk, intersection proximity, and the surrounding historic resources. Surrounding historic resources include the green buffer area and street trees on the north side of Harbor Road. A 45-degree angle is needed to allow entering and exiting vehicles to only use the 12-foot through and right-turn lane on Harbor Road and not encroach on the left-turn lane. This layout results in providing five parking spaces, two greater than the parallel parking concept, and two less than the current configuration. **This alternative has several safety concerns, including the following:**


STRATEGY 4
INTERSECTION UPGRADE WITH NO US ROUTE 7 SOUTHBOUND RIGHT TURN LANE AND NARROWER HARBOR ROAD
VT STATE PLANE GRID
N
LEGEND
= HIGHWAY ROW
= PROPERTY LINES
RETAIN EXISTING TREE
WIDEN TO ADD LEFT TURN LANE
REORIENT ON-STREET PARKING
4' BIKE LANES (TYP.)
HARRINGTON VILLAGE INTERSECTION IMPROVEMENTS
EXTEND NB LEFT TURN LANE
BUS TURNOUT
TO VERGENNES
MEDIAN/REFUGE ISLAND
MEDIAN/REFUGE ISLAND
NEW SIDEWALK LINK
TO BURLINGTON
EXTEND SB LEFT TURN LANE
NEW SIDEWALK LINK
COMPLETE STREET WITH CURBS, STREET TREES, STREET LIGHTING, BIKE LANES, AND SIDEWALKS
PROVIDES FOR POTENTIAL LOOP ROAD CONNECTION. ACCOMMODATES RIGHT TURNS ONLY (IN & OUT)
RESTRIPE TO EXTEND THRU LANE

- When backing up to exit a parking space, the driver has limited visibility of vehicles and bicycles on Harbor Road where there is a relatively narrow curb lane of 12 feet proposed to avoid adverse effects on the historic resources.
- The parking is within 30 feet of an intersection where westbound Harbor Road vehicles may be attempting to make a green light. When this occurs drivers are less likely to yield to exiting parked vehicles.
- Drive-in angle parking typically produces more crashes. Studies have shown converting angle parking to parallel parking reduced crashes by 19% to 63%. See: http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/docs/pdf/Comparison_of_Angle_and_Parallel_Parking.pdf
- Drivers loading goods into the trunk of the vehicle can do so at the edge of the 12-foot curb lane increasing their risk exposure.
- Westbound Harbor Road vehicles desiring to park may attempt to access an available space by turning left across two opposing lanes directly adjacent to an intersection. In addition to safety concerns, this could have negative impacts to the operation of the intersection.

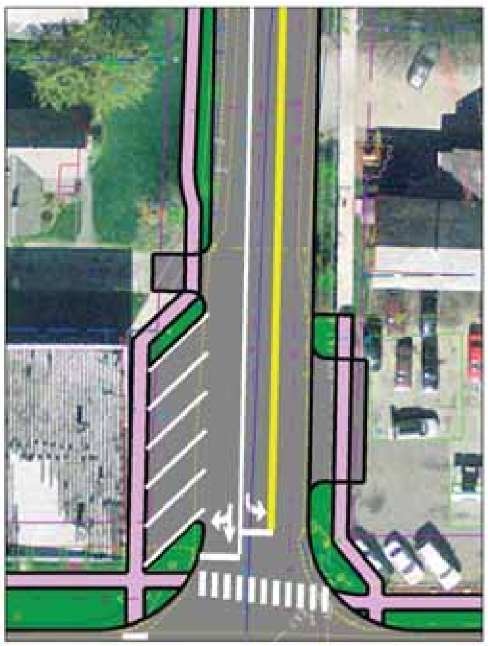


Figure 17: Drive-in Parking Alternative

Given the safety issues associated with the operation of drive-in angle parking it is not recommended for this location.

To address these safety concerns an alternative of using back-in angle parking was developed. This is also known as reverse angle parking. Regardless of what it is referred to as, the concept remains the same. The angles of the parking spaces are aligned so that a driver has to back into the space. When parked, the front of the vehicle faces the street instead of the curb. This provides motorists with better vision of the street as they exit a parking space and enter moving traffic. A plan of back-in angle parking is shown in Figure 19. Due to the location of the intersection, crosswalk, and driveway, this alternative provides 4 parking spaces: one greater than the parallel parking concept and one less than traditional drive-in angle parking.

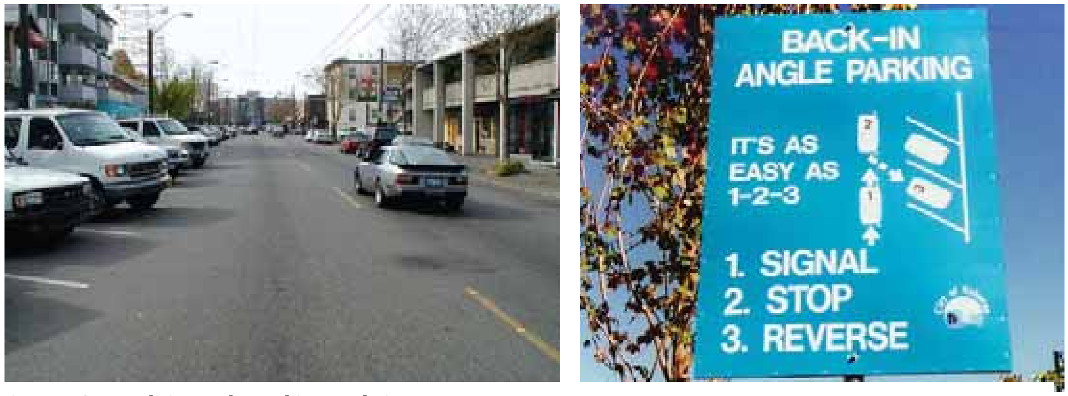


Figure 18: Back-in angle parking and signage.

The concept has many benefits over other parking types. These benefits include the following:

- When exiting, the driver is closer to the travel lane and facing forward, thus providing them greater visibility and the ability to make eye contact with oncoming vehicles and bicyclists.
- Drivers loading goods into the trunk of the vehicle can do so at the curb side, rather than in the travel lane thereby reducing their risk exposure.
- Children exiting the car are naturally guided directly to the sidewalk and not into the street.
- It eliminates the risk that is present in parallel parking situations where a motorist may open the car door into the path of a bicyclist.
- Compared to traditional drive-in angle parking, it removes the difficulty that drivers, particularly older ones, have when backing into moving traffic.

Similar to drive-in angle parking, when a car backs in it is important that it does not encroach beyond the curbing into any adjacent pedestrian space. It is increasingly important that engines should not idle as tailpipe emissions are now directed to the curbside: which is particularly undesirable near a sidewalk café or other sensitive location.

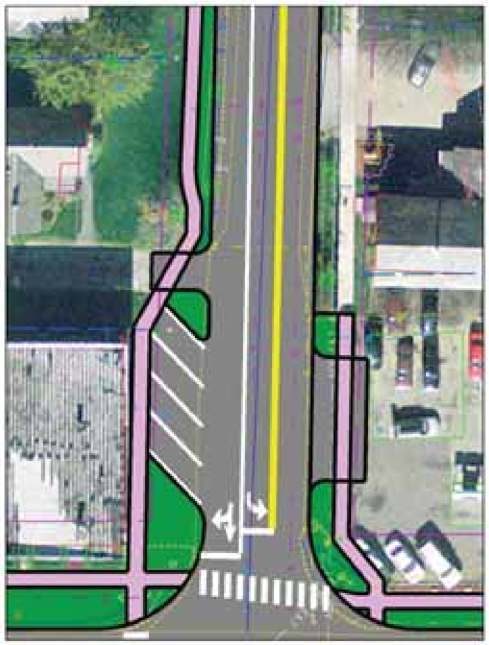


Figure 19: Back-in Parking Alternative

The City of Seattle, Washington has had back-in angle parking for more than 30 years. It has about 280 blocks of angled parking spaces: most of which are back-in. Seattle also has drive-in angle parking but prefers back-in angle parking because it is safer. This is especially true for pedestrians. The City of Tucson, Arizona found that after converting drive-in angle parking to back-in angle parking, bicycle collisions with vehicles leaving their parking spaces fell from 3-4 per year to zero, after four years. See: http://streetswiki.wikispaces.com/Angled+Parking

Back-in angle parking is not widely used in Vermont. To assist educating drivers, signage as shown in Figure 18 can be installed.

7.3 Comparison of Alternatives

An evaluation matrix can be found on page 60 and provides a comparison of alternatives. The major differences among the alternatives are the intersection performance and impacts to historic resources. The benefits and impacts of the base improvements on US Route 7 are similar for all alternatives 1, 2 and 3. The added Harbor Road lane and the added and extended US Route 7 left-turn lanes improve traffic operations while expanding the existing pedestrian and bicycle facilities. Strategy 2 provides the greatest intersection capacity since it removes Falls Road entering traffic from the US Route 7 intersection. This provides an opportunity to create a more pedestrian friendly street design on Falls Road with a narrower roadway, on street parking, and greater space for street trees and pedestrian amenities. By redirecting traffic to Church Street, Strategy 2 does require greater improvements to the US Route 7/Church Street intersection and consequently greater costs.

For all alternatives, additional sidewalks along US Route 7 and Falls Road are provided to address some missing sections and shoulders for bicyclists are extended along US Route 7 through the intersection. All alternatives include elements consistent with village plans. These are illustrated on the typical sections. Better defining of the roadway and pedestrian zones is provided with addition of curbs, sidewalks, street trees, and pedestrian scale lighting. To assist with the visualization of improvements, a perspective drawing of the improvements was developed. The existing and proposed views are shown below and on the following page. This view is looking north along the eastern edge of US Route 7. It is approximately opposite the drive to the Town facilities and near the southern end of the proposed left-turn lane where the widening of US Route 7 is the greatest. The drawing illustrates the proposed widening, on road bicycle facilities, and the resulting streetscape along US Route 7. The street lighting shown is for illustrative purposes and the actual fixture may vary.

Both Strategies 3 and 4 incorporate a pedestrian refuge island on the northbound approach to the US Route 7 / Church Street intersection. This island provides an opportunity to establish a southern gateway to the village and serves as a refuge space for crossing pedestrians. Strategy 3 allows for a southbound left-turn lane at the intersection which would mitigate left turners from blocking through traffic. It would also give pedestrians a better understanding of oncoming traffic behavior and eliminates through vehicles from using the wide shoulder to bypass left turners. Strategy 4 does not allow for the southbound left-turn lane and instead provides an additional crosswalk and expanded refuge island on the north side of the intersection. The expanded refuge island could support an additional two trees in the median as shown on the plan. This would provide a more defined southern gateway and increased pedestrian safety. The wide shoulder on the western side of the roadway is also narrowed so vehicles cannot use it to bypass left turners and create a potential blind spot for crossing pedestrians. These features could also be added to Strategy 1 but would have additional costs than what is reported in the evaluation matrix.

Figure 20: Shelburne Perspective Existing Conditions

Figure 21: Shelburne Perspective Proposed

All strategies require little construction costs associated with the Falls Road approach. It is primarily resurfacing, pavement markings and signage. Therefore if Strategy 1 or Strategy 4 was constructed there would be little investment that would be negated if Falls Road was adjusted to one way (Strategy 2) or rights only (Strategy 3) in the future.

A major difference in the alternatives is the effect to historic resources. Through discussions with the VTrans Historic Preservation Officer (HPO) it was learned the proposed US Route 7 southbound right-turn lane and Harbor Road widening, associated with Strategies 1, 2 and 3, may be considered an Adverse Effect on Section 106 and Section 4(f) resources. This is due to the loss/conversion green space within a historic district to transportation use. Section 106 requires an evaluation of avoidance alternatives. Section 4(f) requires alternatives to the conversion of the protected resource and demonstration that no prudent and feasible alternatives to avoid the adverse effect exist, and finally, requires advancing the least harmful alternative that meets the project purpose and need. Through consultation with VTrans HPO, Strategy 4 was developed to avoid an adverse effect and reduce impacts. It achieves this by not constructing a US Route 7 southbound right-turn lane and by minimizing the widening on Harbor Road.

Table 13: Evaluation Matrix

CRITERIA	No Build	Strategy 1 (Upgrade Intersection)	Strategy 2 (One Way Falls Rd)	Strategy 3 (Falls Road – Right-only)	Strategy 4 (Upgrade Intersection w/o Turn Lane)
Construction Costs	$0	$1,500,000	$1,900,000	$1,700,000	$1,400,000
PURPOSE AND NEED					
Improves Intersection Operation 2032 PM V/C and LOS (Average delay)	1.21 (125.5)	0.88 (34.2)	0.83 (36.5)	0.89 (37.1)	0.99 (47.3)
Improves Bicycle Facilities	No	Bike lanes on Harbor Road and US Route 7 thru intersection.	Same as Strategy 1 but provides more opportunity for bicycles on Falls Road	Similar to Strategy 1	Similar to Strategy 1 but removes bike lanes on Harbor road
Improves Pedestrian Facilities	No	New sidewalk links on Falls Road and US Route 7. Increases crossing distances up to 16 ft.	Same as Strategy 1 but provides more opportunity for pedestrians on Falls Road Increases crossing distances up to 16 ft.	Similar to Strategy 1 Increases crossing distances up to 16 ft.	Similar to Strategy 1 but has shorter US 7 crossing on north approach.
Provides Traffic Calming / Gateway	No	Some calming from curbs, streetscape, and on-street parking	Opportunity for median/refuge island on US7 South of Church Street	Similar to Strategy 2	Similar to Strategy 1. Narrower Harbor Road lanes. Refuge islands on US 7 at Church St.
IMPACTS					
Net Change in On-street parking spaces	0	-1(Harbor Road)	-1(Harbor Road) -5 (Church Street)	-1 (Harbor Road) -13 (Church Street)	-4 (Harbor Road)
Tree Impacts	0	-9 (Harbor Road) +20 (US Route 7)	-9(Harbor Road) +30 (US Route 7)	-9(Harbor Road) +30 (US Route 7)	0 (Harbor Road) +20 (US Route 7)
Aerial Utilities	0	4 poles relocated on US Route 7	4 poles relocated on US Route 7	4 poles relocated on US Route 7	1 poles relocated on US Route 7
ROW Impacts	None	600 sf (Harbor Road)	600 sf (Harbor Road)	600 sf (Harbor Road)	0 sf
Historic Resources	None	Adverse Effect due to US Route 7 southbound right turn lane and Harbor Road widening	Most impact due to additional Church Street impacts and extending US Route 7	Most impact due to additional Church Street impacts and extending US Route 7	Least due to no US 7 southbound right-turn lane and narrower Harbor Rd
Additional Pavement	None	20,500 sf	23,000 sf	23,000 sf	14,900 sf

8.0 Stakeholder Input

On April 11, 2013 and on May 13, 2013, stakeholders meetings were held to brief attendees on the project status and the analysis and description of considered alternatives. Over 20 stakeholders attended. It was evident many are passionate about their community; as a group stakeholders provided extensive input, comments and questions. The following is a summary of these and the report strategies were updated to address these where applicable and/or feasible.

- It was pointed out the existing signal operation may be improved with a left-turn arrow for the Harbor Road approach since it is not clear to Harbor Road traffic that they do not need to yield to Falls Road traffic. This improvement has been made by VTrans.
- Also pointed out that the "No Right Turn" arrow for the Falls Road approach creates a long all red phase and delays traffic.
- Suggested that the Harbor Road approach have an exclusive right-turn lane and the throughs and lefts be combined. It was explained that due to the large number of left turns, the lanes are more balanced and would operate more efficiently with a thru/right-turn lane and an exclusive left-turn lane.
- Many expressed concern with the One-way Falls Road alternative indicating it would be confusing, requires traffic to make more turns, not as pedestrian friendly due to perceived higher speeds, and may be harmful to existing businesses on Falls Road.
- The effects of the Loop Road were questioned and it was indicated the Loop Road did not serve as a by-pass for through traffic and more served the traffic associated with the potential development created by the new access. Without a direct connection to the US Route 7 intersection, the Loop Road traffic has little effect on the intersection's operation.
- It was suggested grid streets, west of the intersection, be pursued in lieu of intersection improvements. These streets would provide an alternative to the Harbor Road traffic but have many challenges and impacts making it difficult and very time consuming to construct. It was indicated grid streets may be a longer term goal of the town to pursue.
- A participant suggested considering a phased approach to the construction such as constructing just one of the additional turn lanes on the approaches before doing additional ones.
- It was indicated the traffic congestion is for a very short duration and is primarily when school opens or closes. The need to do improvements for this was questioned. It was suggested the Harbor Road approach be provided less green time so as the US Route 7 congestion could be relieved and it

would provide an incentive for parents to not bring their children to school. Concerns when doing this include the deteriorating safety associated with delayed traffic. Also a graph indicating traffic volumes throughout the day was added to the report. This indicates the highest traffic volumes extend beyond the hour of the school opening and closing. Also the intersection capacity analysis indicates and VTrans confirmed the signal is optimized for the observed traffic volumes.

- Adaptive Signal Control was identified as another option to consider as it may address some of the inefficiencies associated with the existing signal operations.
- New traffic counts were suggested as traffic operations seem to have improved since VTrans made certain improvements to the intersection. Stantec noted that some of the perceived improvement in operations may simply be due to seasonal variations in traffic volumes. Volumes and congestion are likely to pick up in the summer months.
- It was pointed out the reconfiguration of parking on Harbor Road was a concern to local businesses. The proposed reconfigured parking provides one less space (Strategies 1-3) and creates on street parallel parking that has safer access and egress, less impact on intersection operations, and provides traffic calming.
- Historic Commission representative expressed concern regarding the historic district impacts of the proposed US Route 7 widening, particularly the US Route 7 Southbound right-turn lane. It was also noted that the existing drainage ditches abutting the road would be impacted. Stantec presented cross section plans illustrating how the use of curbing and a closed drainage system would eliminate the ditches.
- Concern expressed that widening the intersection approaches would increase pedestrian crossing times and in turn affect intersection efficiency. Stantec noted that the walk times were considered in the intersection operations analyses.
- Trade-offs between preserving the historic village character and accommodating all modes of travel with bike lanes and sidewalks were noted. It was indicated sidewalks and bike lanes provide better access to local businesses.
- Details of the projected traffic operations for Strategy 1 showed that of the three lane additions proposed, the addition of a southbound right-turn lane on Route 7 offered the least benefit. This led some to suggest that the southbound right-turn lane be dropped from consideration allowing Route 7 to remain only three lanes wide. The narrower road better accommodates pedestrians and helps preserve the village character.
- A suggestion was made that a new interchange on I-89, Exit 12B, might draw traffic away from Route 7 lessening the need to make changes in the village. It was noted that the 12B project is not presently active and that Shelburne should not rely on that project to solve traffic problems in the village.

- A suggestion was made the bus pull outs might help to improve traffic flow. Likewise, certain bus stops could be relocated to improve flow. The Town Manager is exploring this issue with the CCTA.

9.0 Municipal Preferred Alternative

At their meeting on Tuesday, September 24, 2013 the Shelburne Selectboard was presented with the various strategies. The presentation was well attended with some comments and questions. With no immediate need to make a recommendation, the Selectboard chose to table action on a preferred alternative to their following meeting on Tuesday, October 8, 2013. At this meeting the Selectboard endorsed Strategy 4 as their preferred alternative with the exception of the parallel parking spaces on Harbor Road. In light of business concerns the Selectboard preferred the five drive-in angled spaces over the three parallel spaces. The motion passed 4-1. A copy of the minutes from both meetings can be found in Appendix B.

APPENDIX A

Existing Information
VTrans Crash Listing
VANR Environmental Interest Locator

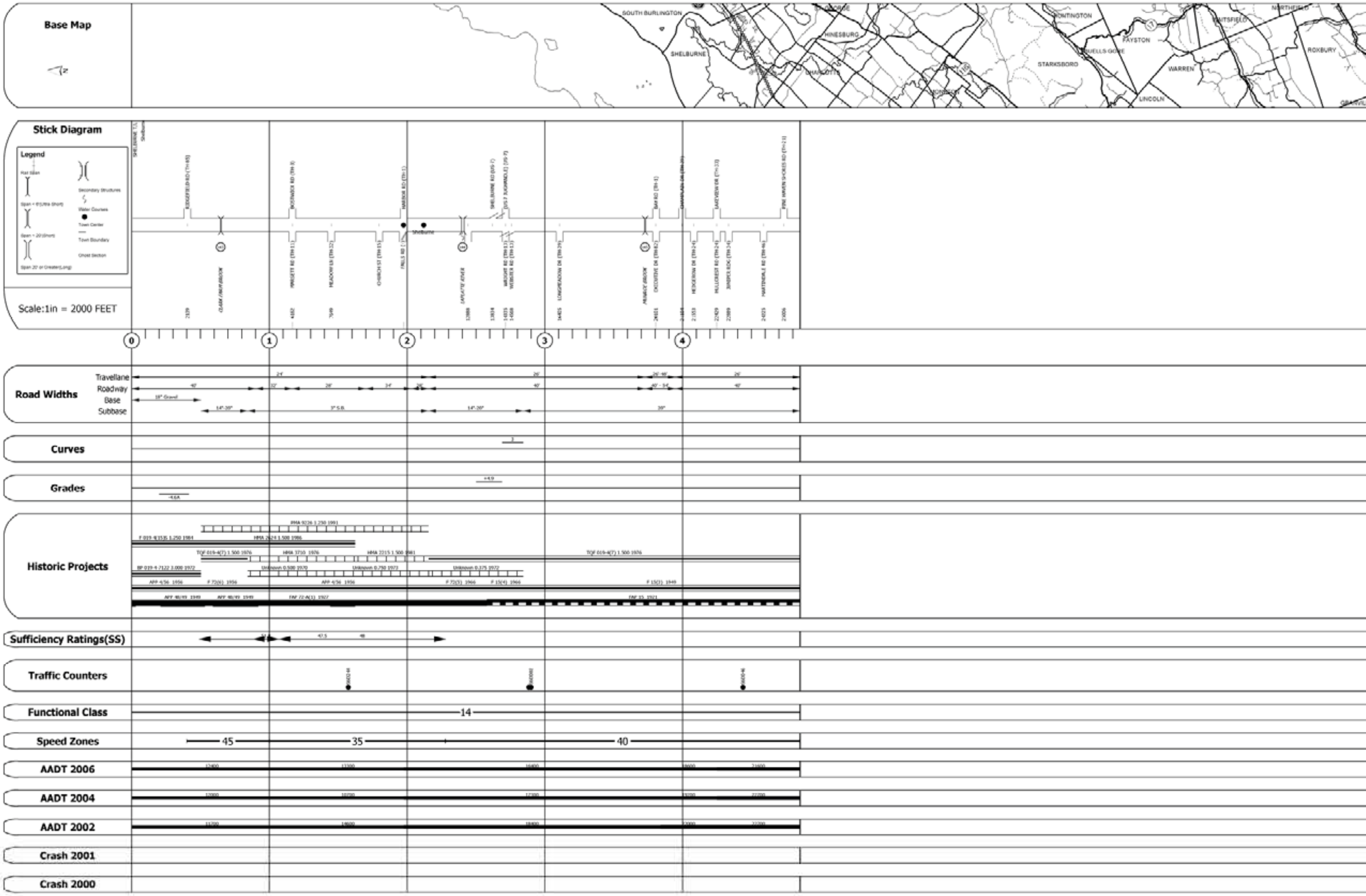
VTrans Working to Get You There

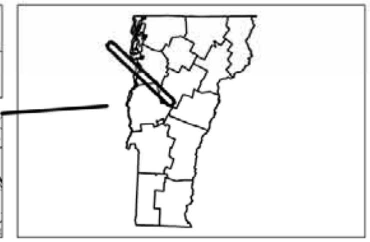
Route Log Progress Chart

DRAFT

Please Note: Errors and Omissions May Exist.
Contact the VTrans Mapping Unit with questions or concerns.

DISTRICT	TOWN	ROUTE
5	SHELBURNE	US-7





DESCRIPTION BLOCK

ⓘ	STRUCT_NUM:	300019014304131
	WIDTH:	0
	HEIGHT:	
	YR_BUILT:	1956
	LASTPROJECTNUMBER:	
	WATERWAYAREATHROUGHCULVERT:	100
ⓘ	STRUCT_NUM:	200019014404132
	WIDTH:	53.3
	HEIGHT:	9999
	YR_BUILT:	2001
	LASTPROJECTNUMBER:	NHEGC FEGC 019-4 26
	WATERWAYAREATHROUGHCULVERT:	
ⓘ	STRUCT_NUM:	300019014504131
	WIDTH:	0
	HEIGHT:	
	YR_BUILT:	2005
	LASTPROJECTNUMBER:	
	WATERWAYAREATHROUGHCULVERT:	115

Historic Projects | Functional Class | Curves | Grades | Traffic Counters | Speed Zones | Sufficiency Ratings | Road Widths | Crash Locations | AADT

Mileage by Functional Class By Sheet		Mileage by Town By Sheet	
019-4 14- URBAN PRINCIPAL ARTERIAL-OTHER	4.854	SHELBURNE - U007-0413	4.854 of 4.854
Total Mileage	4.854	Total Mileage	4.854

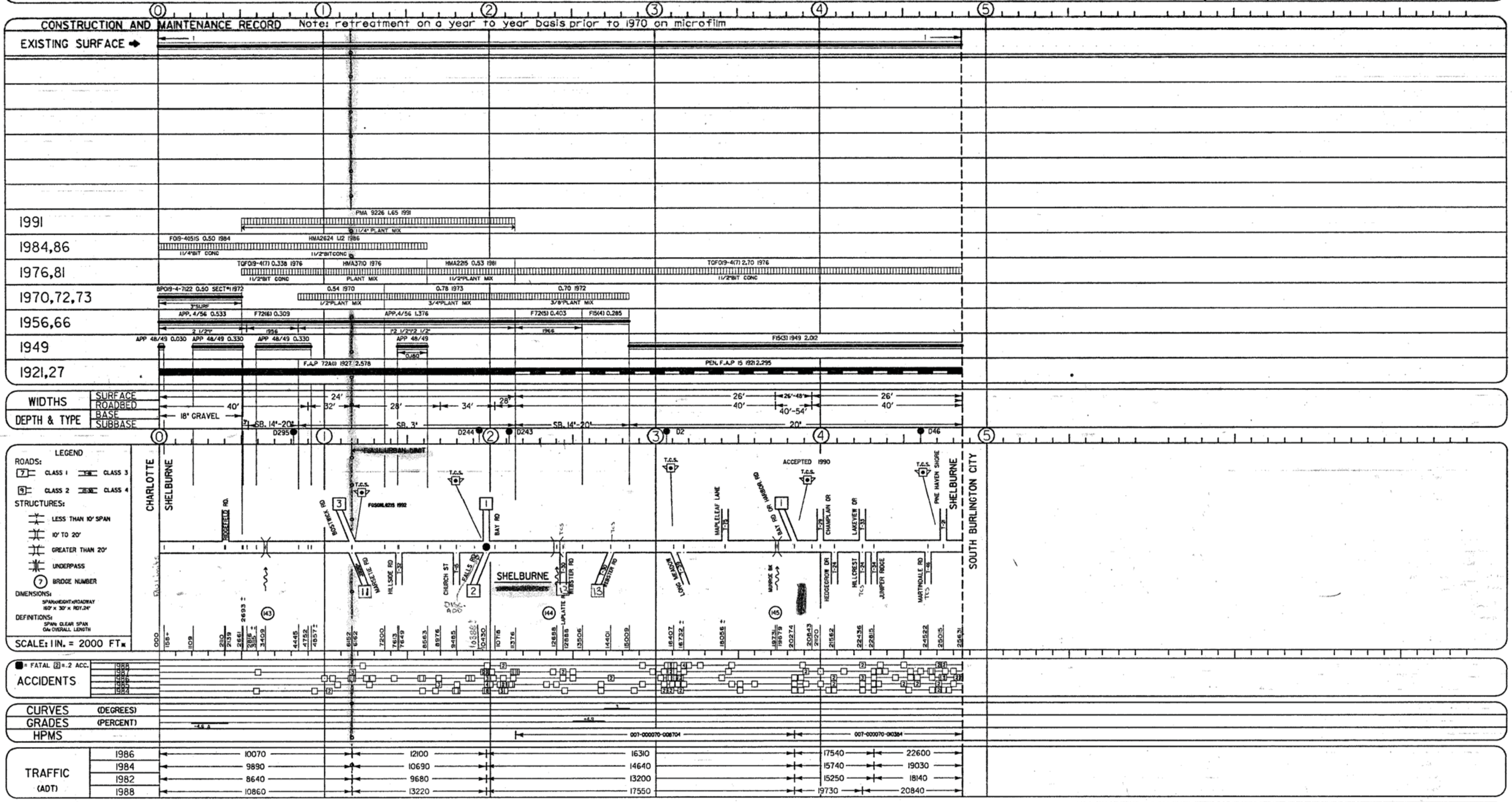
DISTRICT	TOWN	ROUTE	SHEET
5	SHELBURNE	US-7	1/1 Date:11/20/08

For More Information Contact - Vermont Agency of Transportation. Policy & Planning Division - Mapping Unit. 1 National Life Drive. Montpelier. VT 05633-5001 Telephone: 802-828-2600.

ROUTE LOG AND PROGRESS CHART

STATE HIGHWAYS (AND CLASS I TOWN HIGHWAYS)

DISTRICT	TOWN	ROUTE
5	SHELBURNE	[redacted] F.A. U.S. 7



VILLAGE LINE PROJECT LINE STATE HWY. LIMIT F.A.U. LIMIT	[redacted] PA/NHS 019-4	RETREATMENT: BLADE MIX / PLANT MIX / BIT. SEAL	SURFACE TYPE → MILES →

	BIT. CONC.	CONCRETE	BIT. MAC.	BIT. MIX.	S.T.G.	GRAVEL	TOTAL
STATE HWY	4.854						4.854
TOTAL:	4.854						4.854

URB. EXT. 3.687

DATE: DEC. 1992

COUNTY 04	TOWN 13	ROUTE	SHEET
CHITTENDEN	SHELBURNE	U.S. 7	28/40

AGENCY OF TRANSPORTATION
PLANNING DIVISION

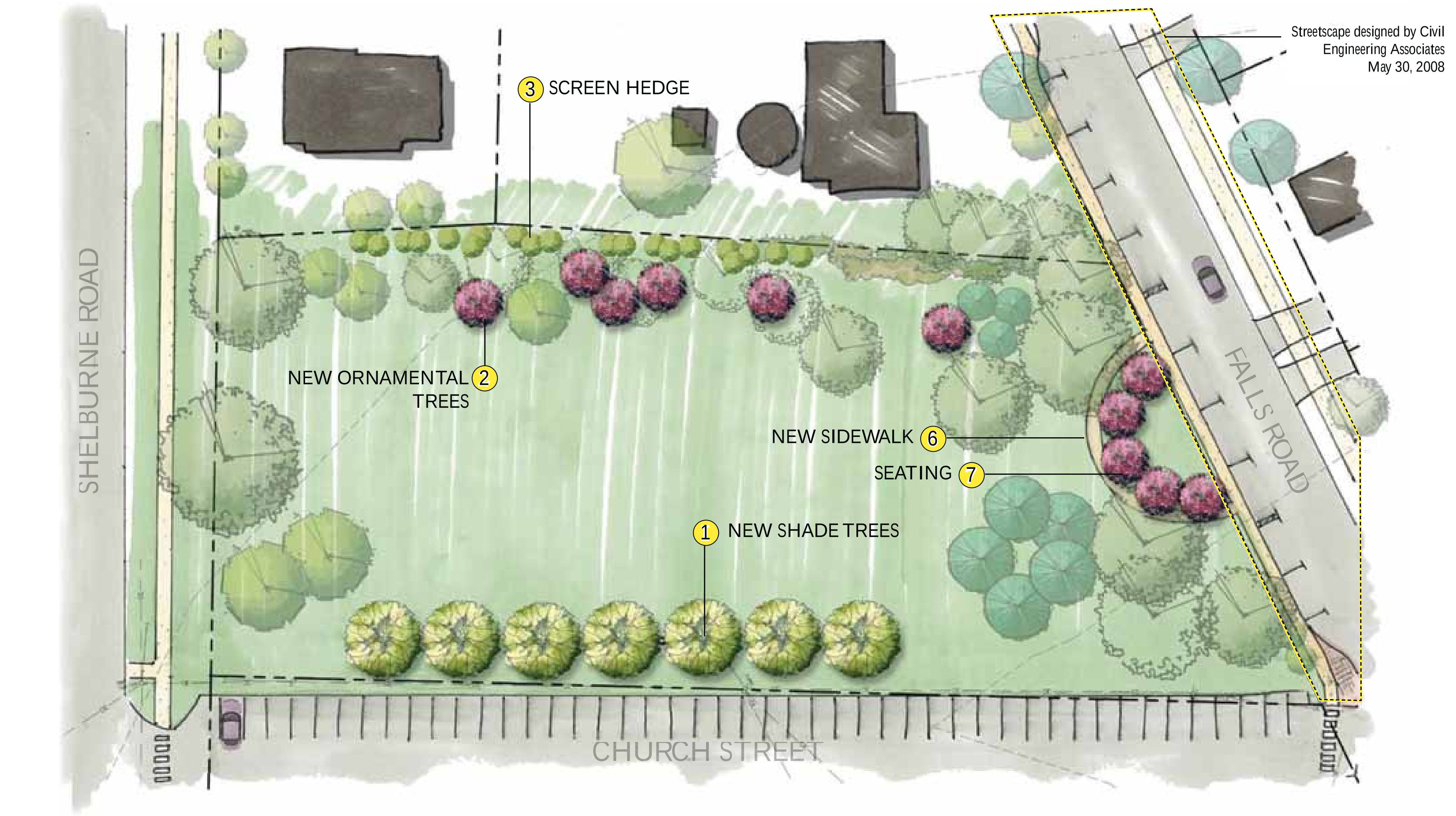
BRIDGE DESCRIPTIONS

143 CONC BOX CS 1956
10'X10'RB 40'
H-20 WTWY 100 SQFT

144 CONC.WF BEAM CS 1956
288.4'X26' RDY 30' OA 299'
1SP@ 64.75',64.25'79.53',79.88'
SW 2.5' L&R H-20 WTWY F 72(5)

145 CONC BOX SC 1949
12'X10'RB 40'
H-15 WTWY 115 SQFT

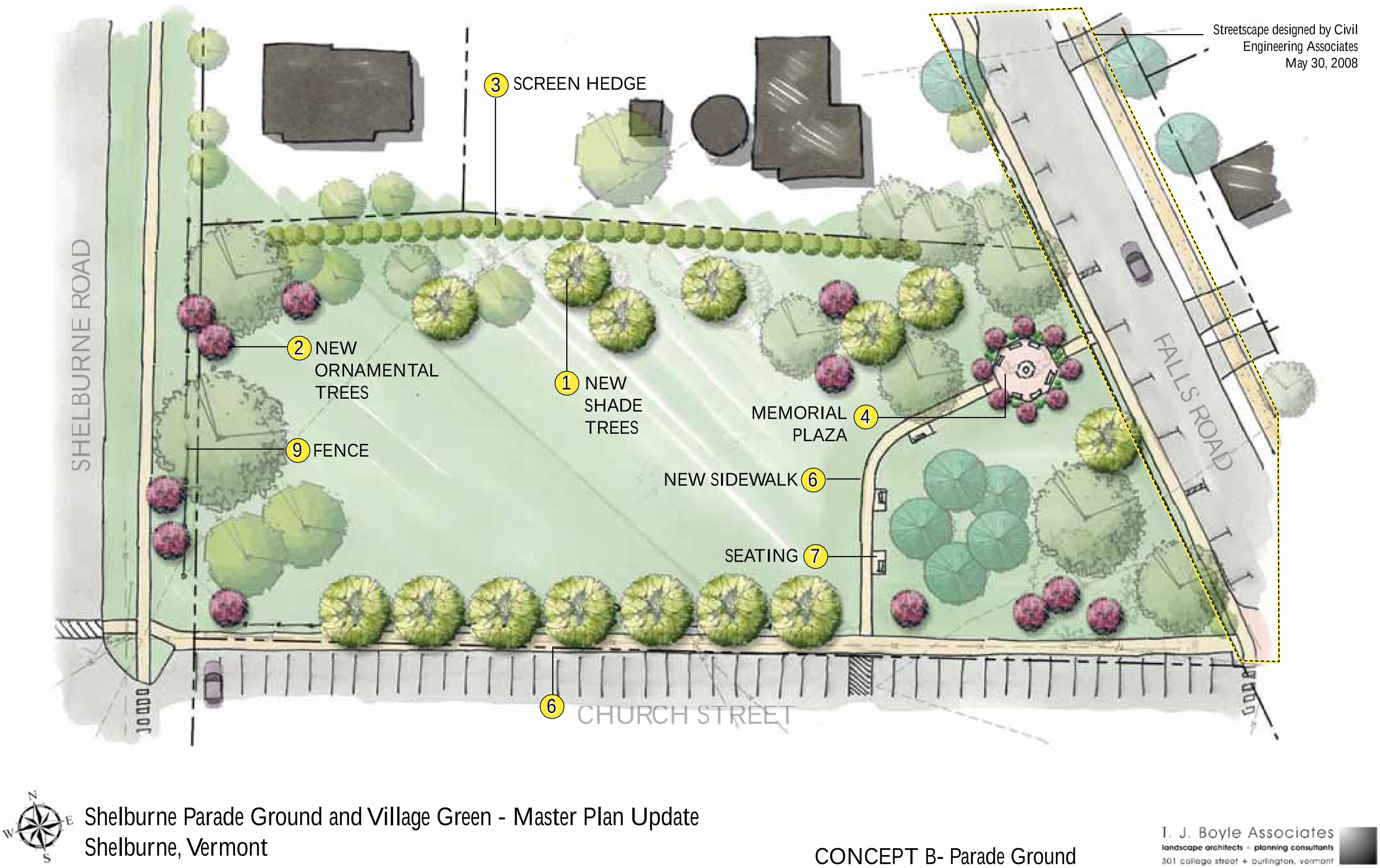
: Sheet Number:



Shelburne Parade Ground and Village Green - Master Plan Update
Shelburne, Vermont

CONCEPT A- Parade Ground

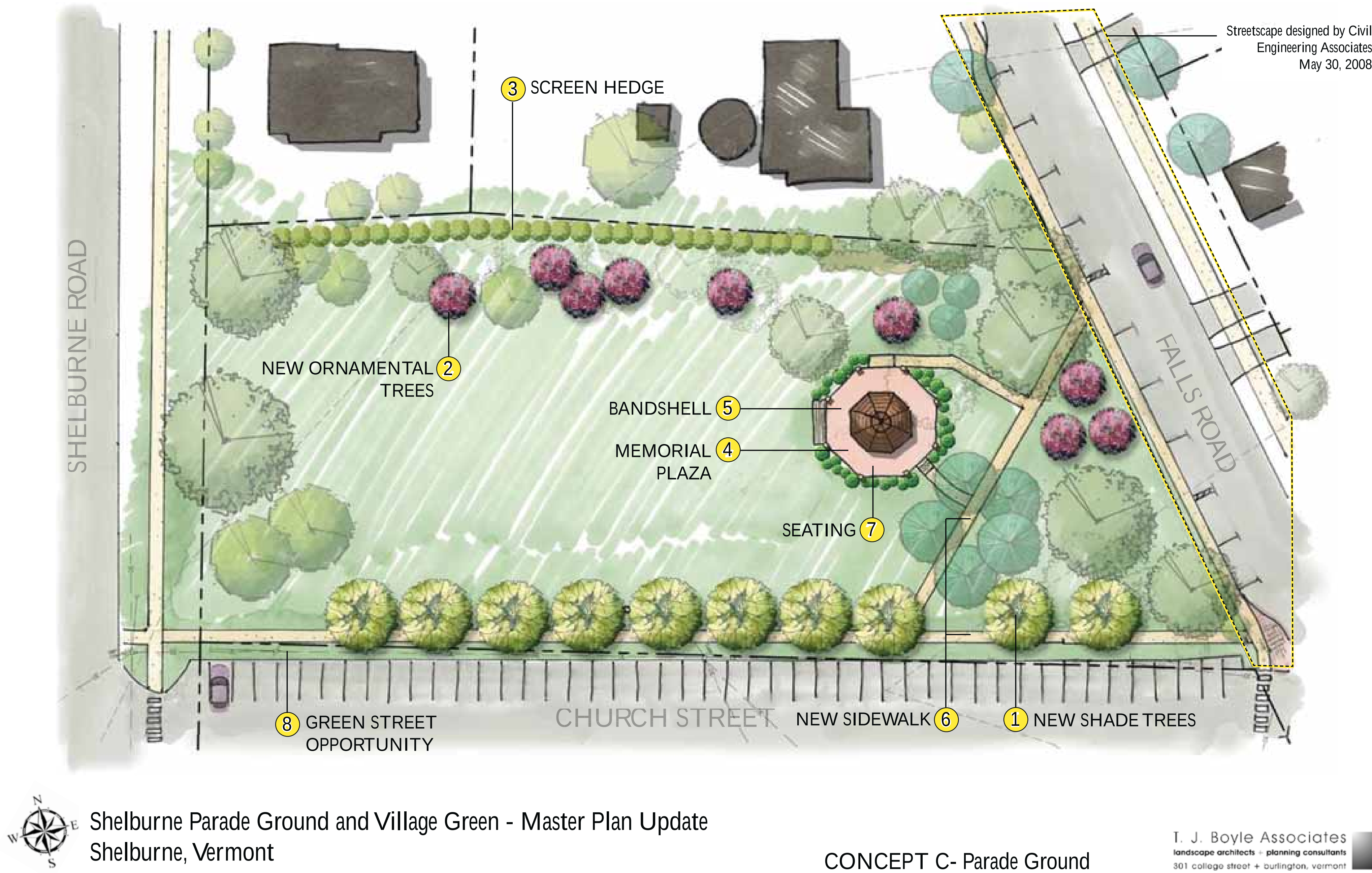
T. J. Boyle Associates
landscape architects + planning consultants
301 college street + burlington, vermont



Shelburne Parade Ground and Village Green - Master Plan Update
Shelburne, Vermont

CONCEPT B- Parade Ground

T. J. Boyle Associates
landscape architects + planning consultants
301 college street + burlington, vermont



Shelburne Parade Ground and Village Green - Master Plan Update
Shelburne, Vermont

CONCEPT C- Parade Ground

T. J. Boyle Associates
landscape architects + planning consultants
301 college street + burlington, vermont

Shelburne Parade Ground and Village Green - Master Plan Update
Shelburne, Vermont

CONCEPT A- Village Green

T. J. Boyle Associates
landscape architects + planning consultants
301 college street + burlington, vermont

Shelburne Parade Ground and Village Green - Master Plan Update
Shelburne, Vermont

CONCEPT B- Village Green

T. J. Boyle Associates
landscape architects + planning consultants
301 college street + burlington, vermont

1 NEW SHADE TREES

3 SCREEN HEDGE

2 NEW ORNAMENTAL TREES

Shelburne Parade Ground and Village Green - Master Plan Update
Shelburne, Vermont

T. J. Boyle Associates
landscape architects + planning consultants
301 college street + burlington, vermont

4 MEMORIAL PLAZA

5 BANDSHELL

6 NEW SIDEWALK

Shelburne Parade Ground and Village Green - Master Plan Update
Shelburne, Vermont

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7 SEATING

9 FENCE

10 STONE SLAB BENCH

8 GREEN STREET OPPORTUNITY

Shelburne Parade Ground and Village Green - Master Plan Update
Shelburne, Vermont

T. J. Boyle Associates
landscape architects + planning consultants
301 college street + burlington, vermont

11 TABLES

12 BIKE PARKING

Shelburne Parade Ground and Village Green - Master Plan Update
Shelburne, Vermont

T. J. Boyle Associates
landscape architects + planning consultants
301 college street + burlington, vermont

2010 Regional Model Volumes

PM Peak Hour 5:00 - 6:00 (17)

US-7/Harbor Rd/Falls Rd

	EB	WB	NB	SB	
L	130	0	7	184	
T	19	13	422	636	
R	9	129	0	113	
Enter	158	142	429	933	1663
Exit	133	203	645	682	1663

	EB
L	96
T	103
R	70
Enter	269
Exit	344

2030 Regional Model Volumes

PM Peak Hour 5:00 - 6:00 (17)

US-7/Harbor Rd/Falls Rd

	EB	WB	NB	SB	
L	149	0	9	222	
T	25	17	455	728	
R	10	130	0	76	
Enter	183	147	463	1025	1819
Exit	101	247	738	733	1819

Percent Growth 9.41%

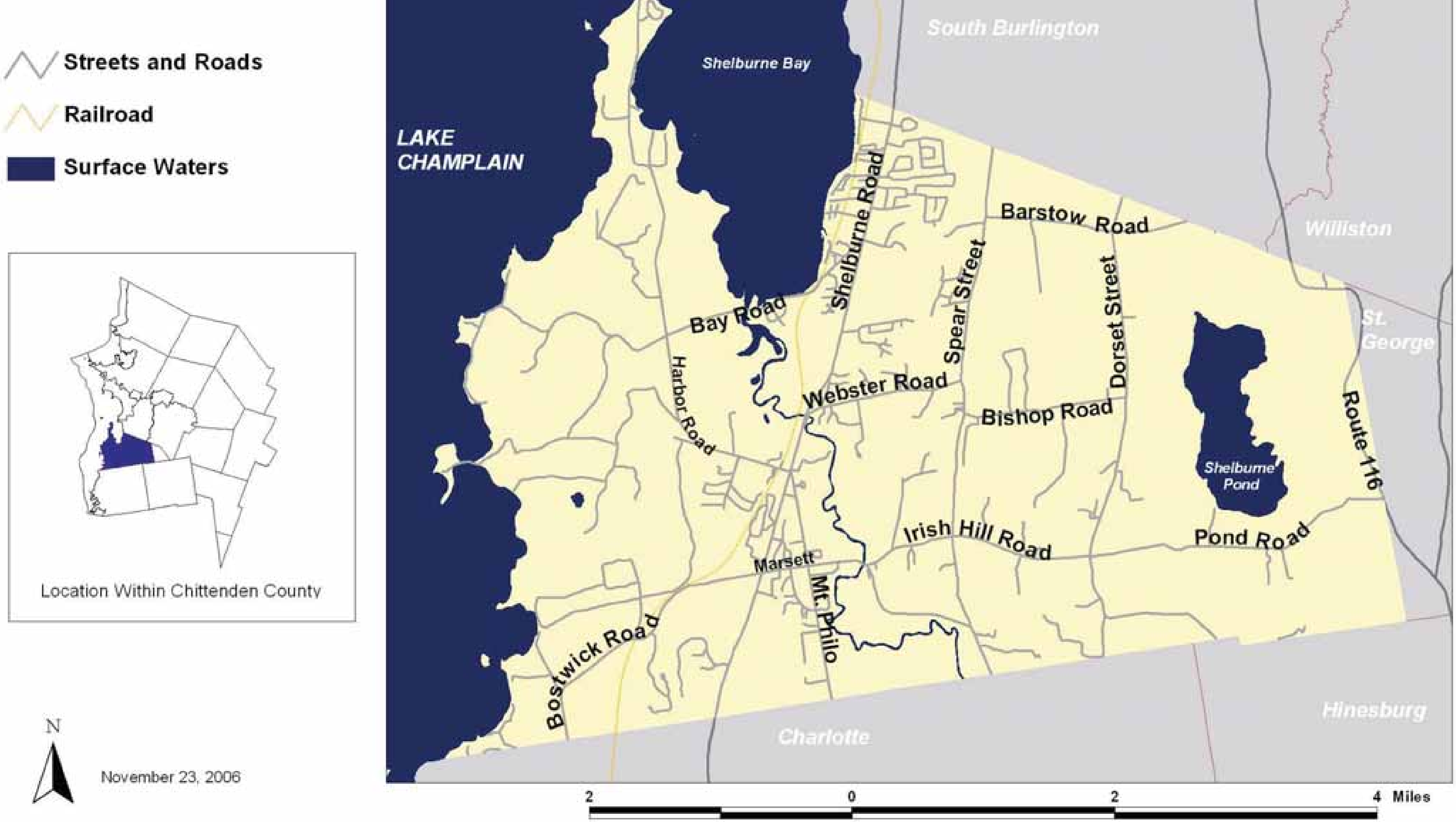
Study Volumes

2012 PM DHV

JS-7/Harbor Rd/Falls Rd

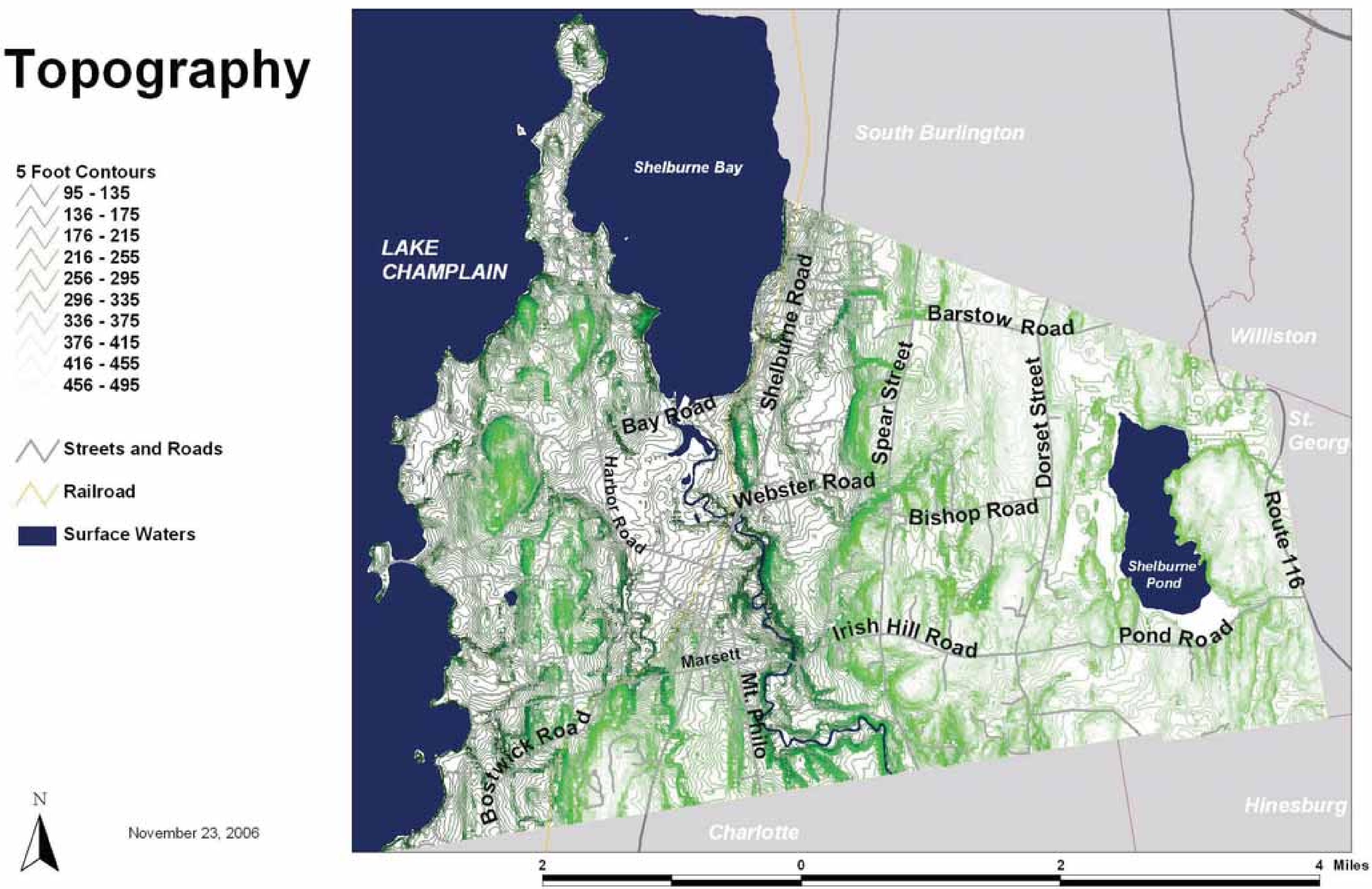
WB	NB	SB	
8	59	131	
187	592	628	
158	10	98	
353	661	857	2140
244	706	846	2140

Base Map

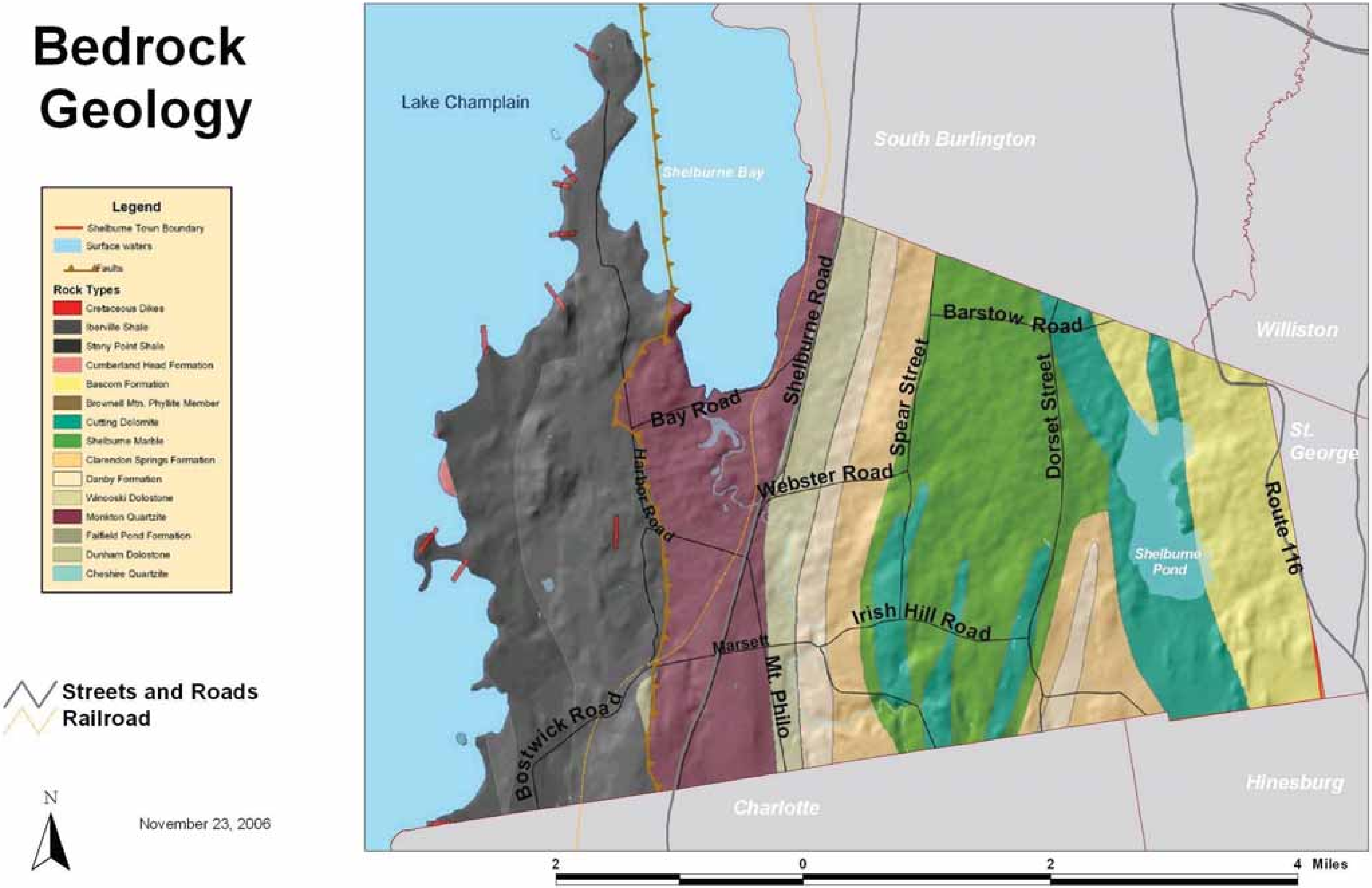


Streets and Roads
Railroad
Surface Waters
Location Within Chittenden County
N
November 23, 2006
LAKE CHAMPLAIN
Shelburne Bay
South Burlington
Williston
St. George
Hinesburg
Charlotte
Shelburne Pond
Barstow Road
Shelburne Road
Spear Street
Dorset Street
Bay Road
Webster Road
Bishop Road
Harbor Road
Route 116
Irish Hill Road
Pond Road
Marsett
Mt. Philo
Bostwick Road
2
0
2
4 Miles

Topography

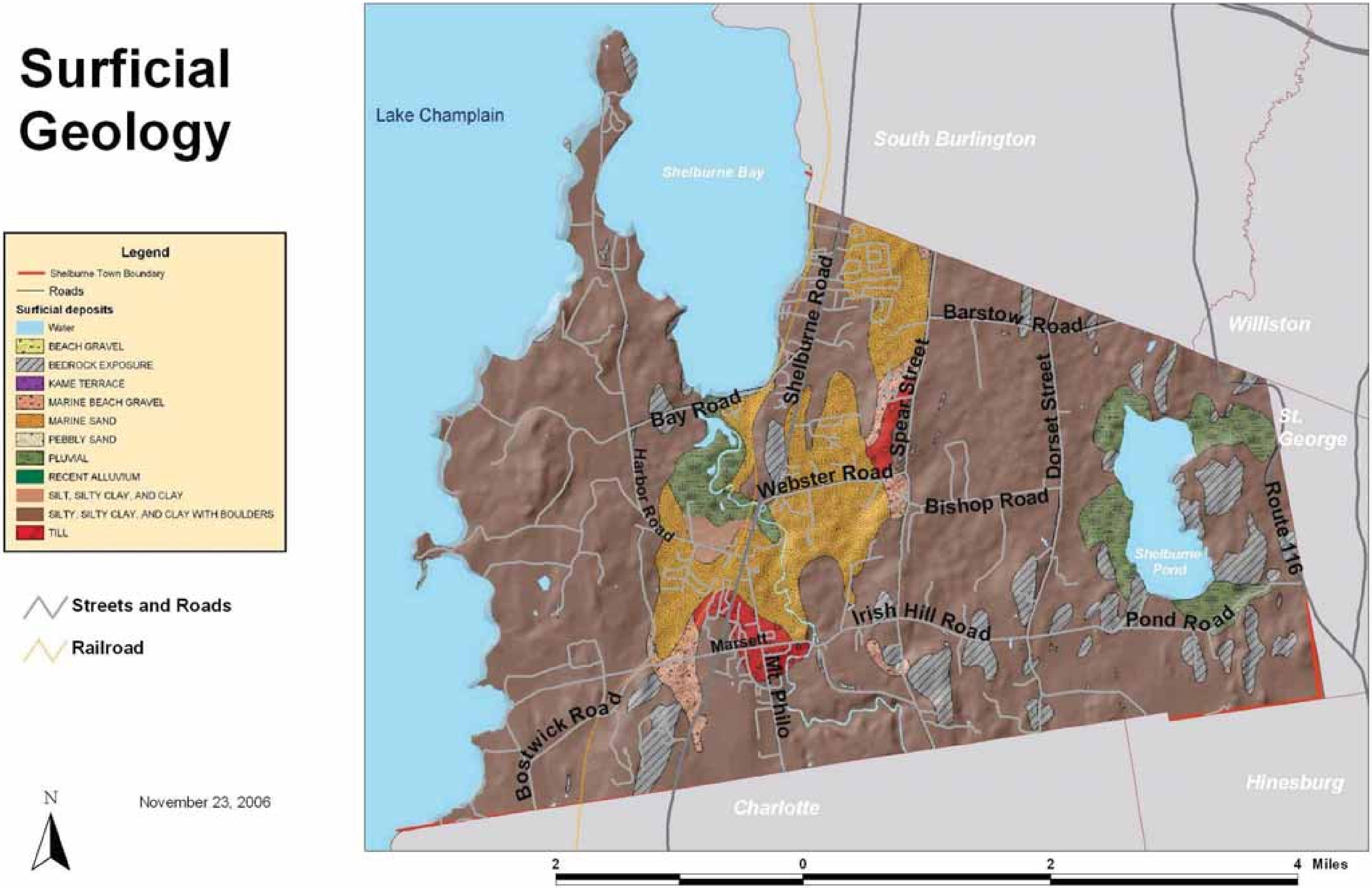

5 Foot Contours
95 - 135
136 - 175
176 - 215
216 - 255
256 - 295
296 - 335
336 - 375
376 - 415
416 - 455
456 - 495
Streets and Roads
Railroad
Surface Waters
N
November 23, 2006
LAKE CHAMPLAIN
Shelburne Bay
South Burlington
Williston
St. Georg
Hinesburg
Charlotte
Shelburne Pond
Shelburne Road
Barstow Road
Spear Street
Dorset Street
Bay Road
Harbor Road
Webster Road
Bishop Road
Route 116
Irish Hill Road
Pond Road
Marsett
Mt. Philo
Bostwick Road
2
0
2
4 Miles

Bedrock Geology



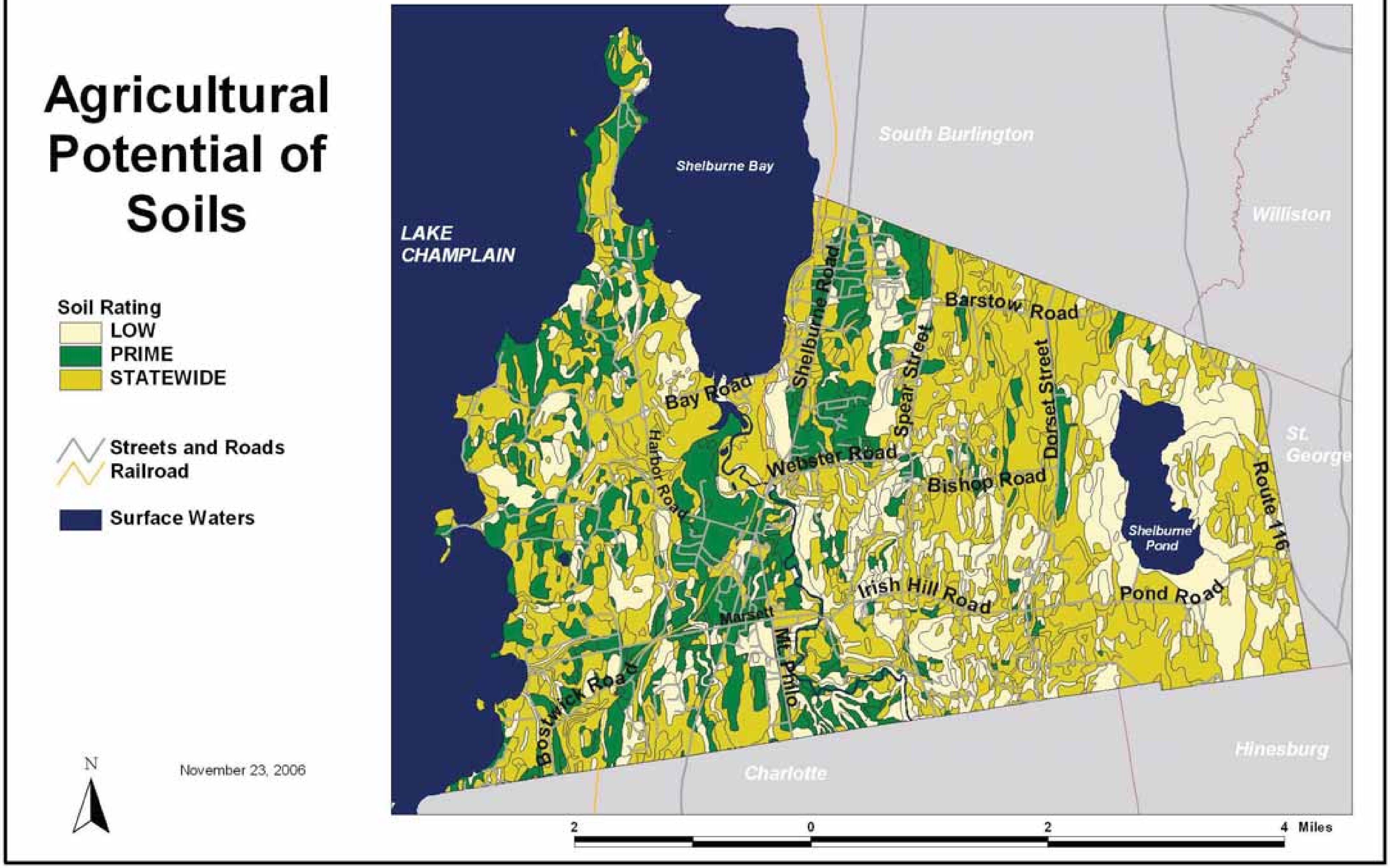
November 23, 2006

Surficial Geology

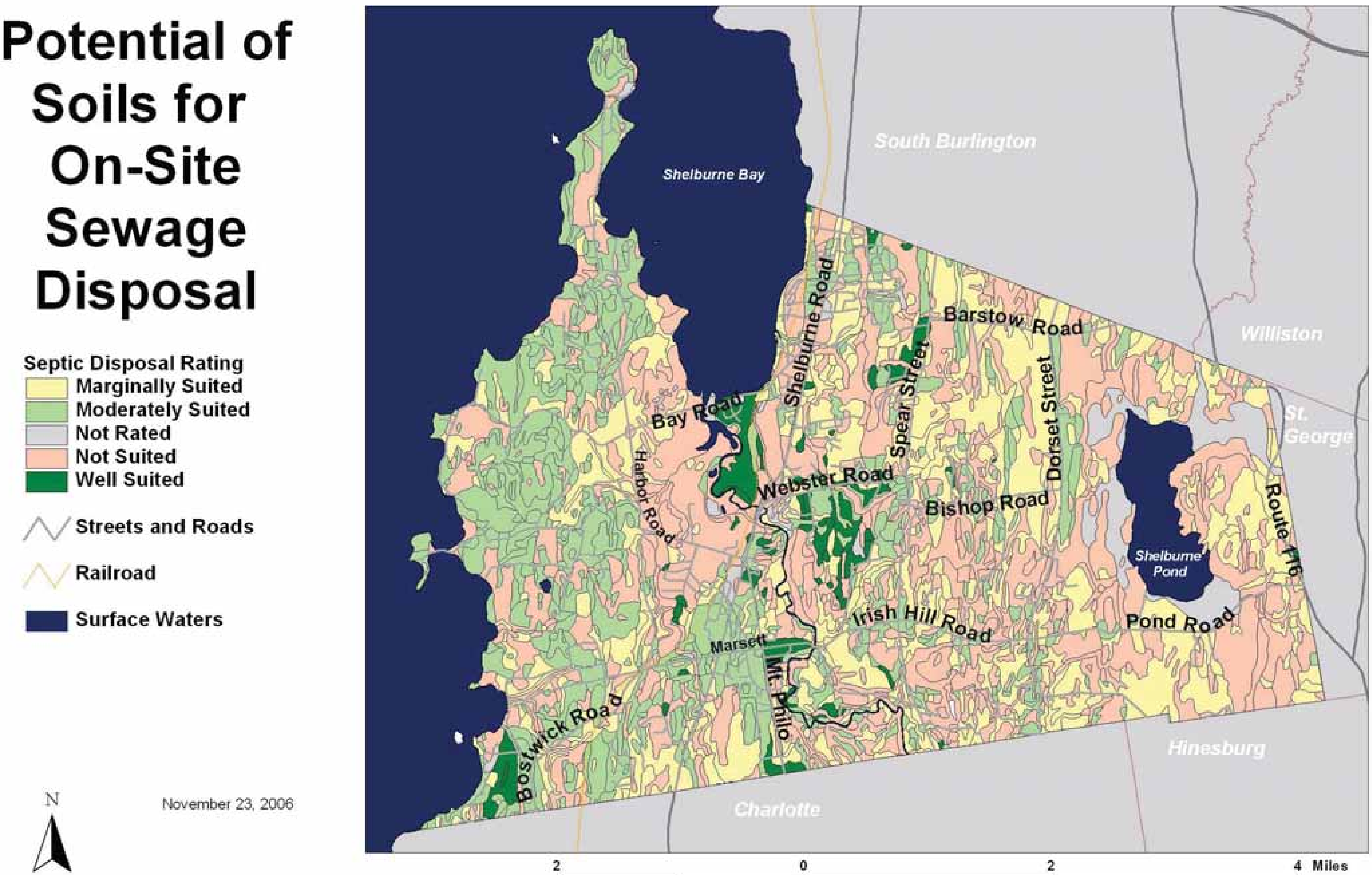


November 23, 2006

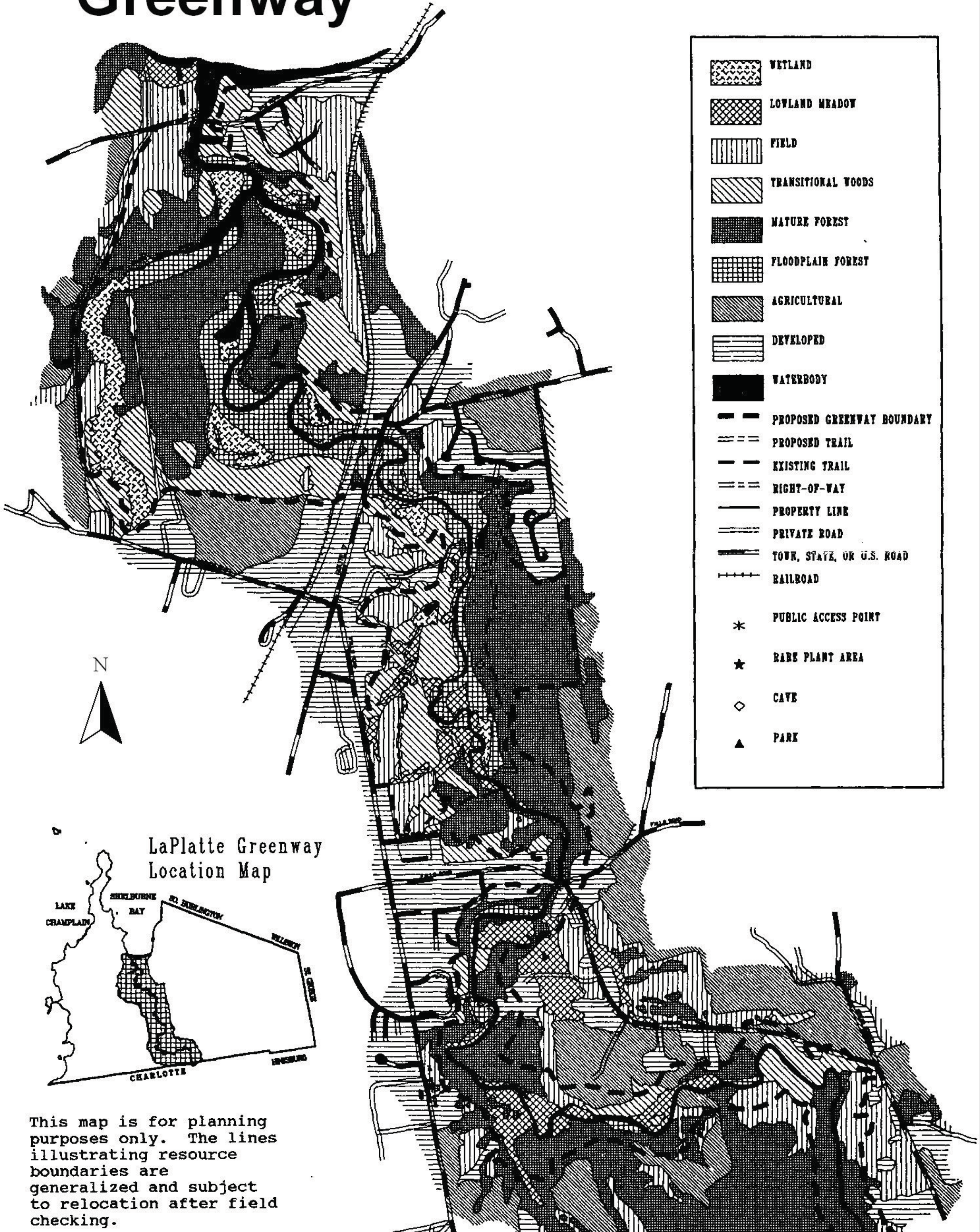
Agricultural Potential of Soils



Potential of Soils for On-Site Sewage Disposal



Laplatte River Greenway



This map is for planning purposes only. The lines illustrating resource boundaries are generalized and subject to relocation after field checking.

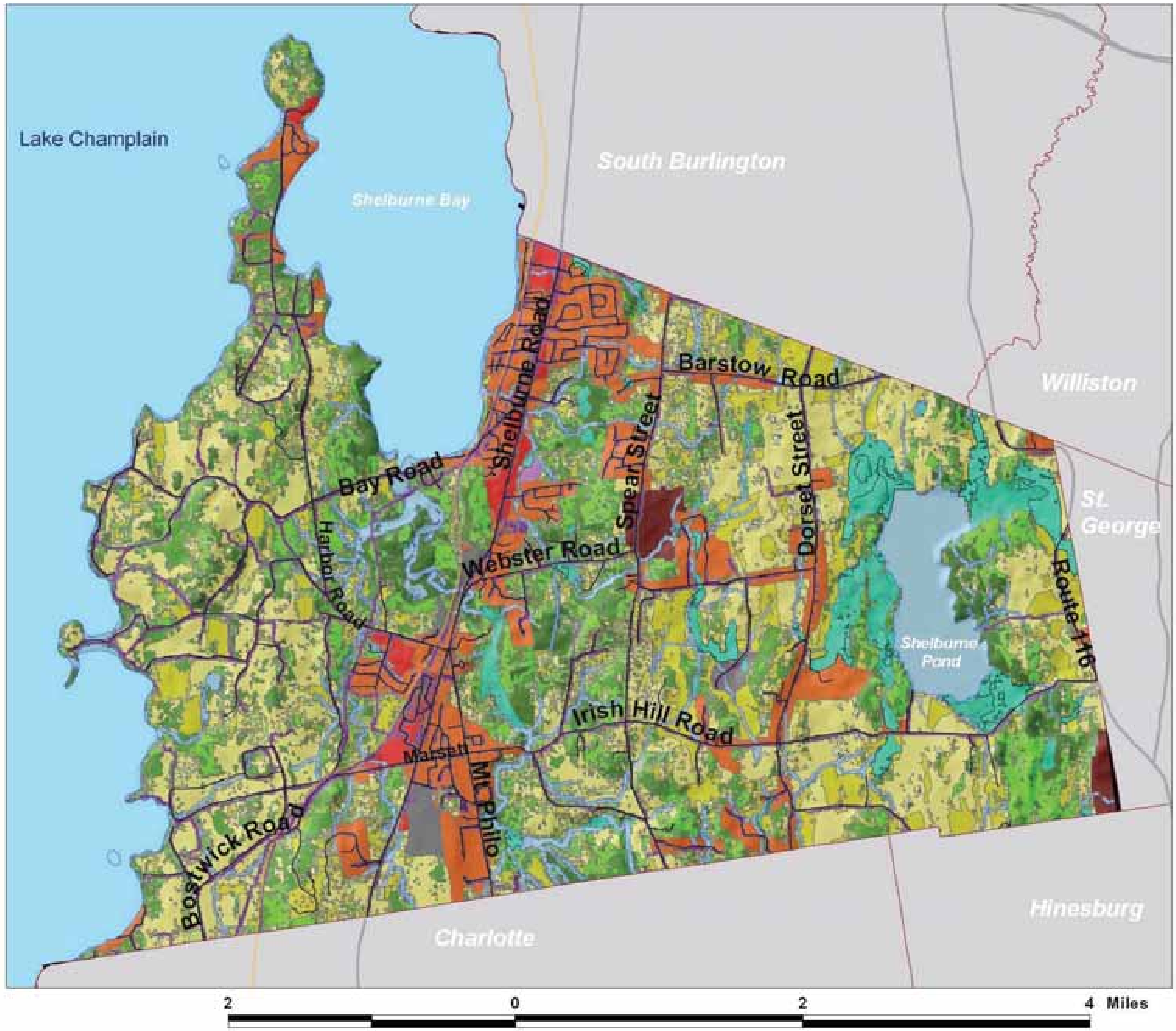
SOURCE MAPS

LAND USE/COVER TYPE - 1988 1:5,000 Scale Vermont Orthophotos
ROADS - 1978 1:20,000 Scale Vermont Orthophotos
SURFACE WATER - 1988 1:5,000 Scale Vermont Orthophotos
PARCEL BOUNDARIES - 1:5,000 Scale Town of Shelburne Taxmaps

November 23, 2006

ARD/GIS
Associates in Rural Development, Inc.

Existing Land Use/Cover



Legend

- Shelburne Town Boundary
- Roads

Land Cover Type

- Brush/Transitional
- Water
- Barren Lands
- Residential
- Commercial
- Industrial
- Transportation/Utilities
- Other Urban
- Orchard
- Other Agricultural/Mixed Open
- Deciduous
- Coniferous
- Mixed Forest
- Forested Wetland
- Non Forested Wetland
- Row Crop
- Hay & Pasture

Streets and Roads
Railroad

N

November 23, 2006

Wildlife Habitat and Associated Resources

Core Habitat Area

Deer Wintering Areas

Wetland Habitat Areas

Forested Areas (Approx.)

Shelburne Trackers Datapoint

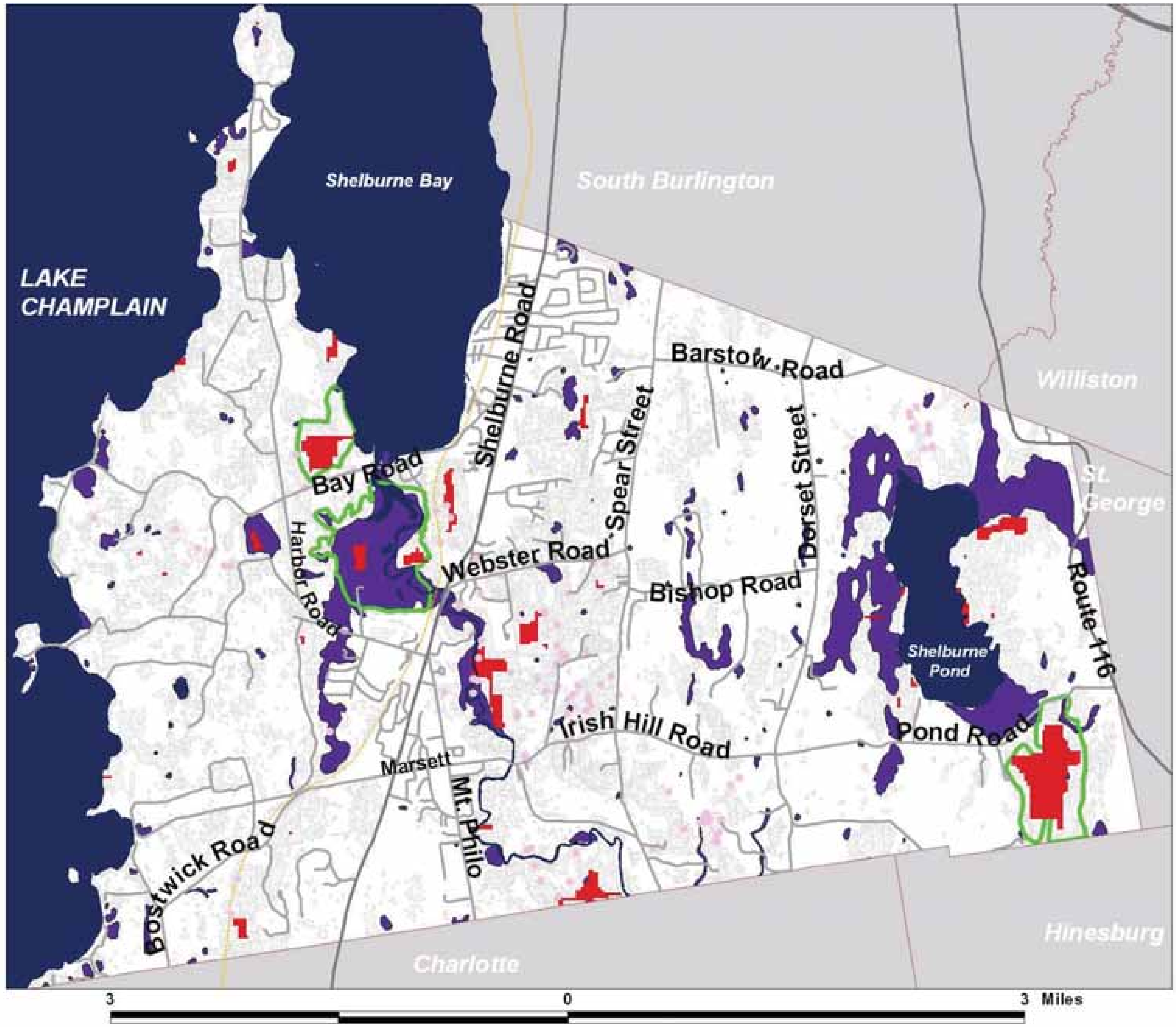
Streets and Roads

Railroad

Surface Waters

N

Novembe 23, 2006



Natural Heritage Sites and Biological Natural Areas

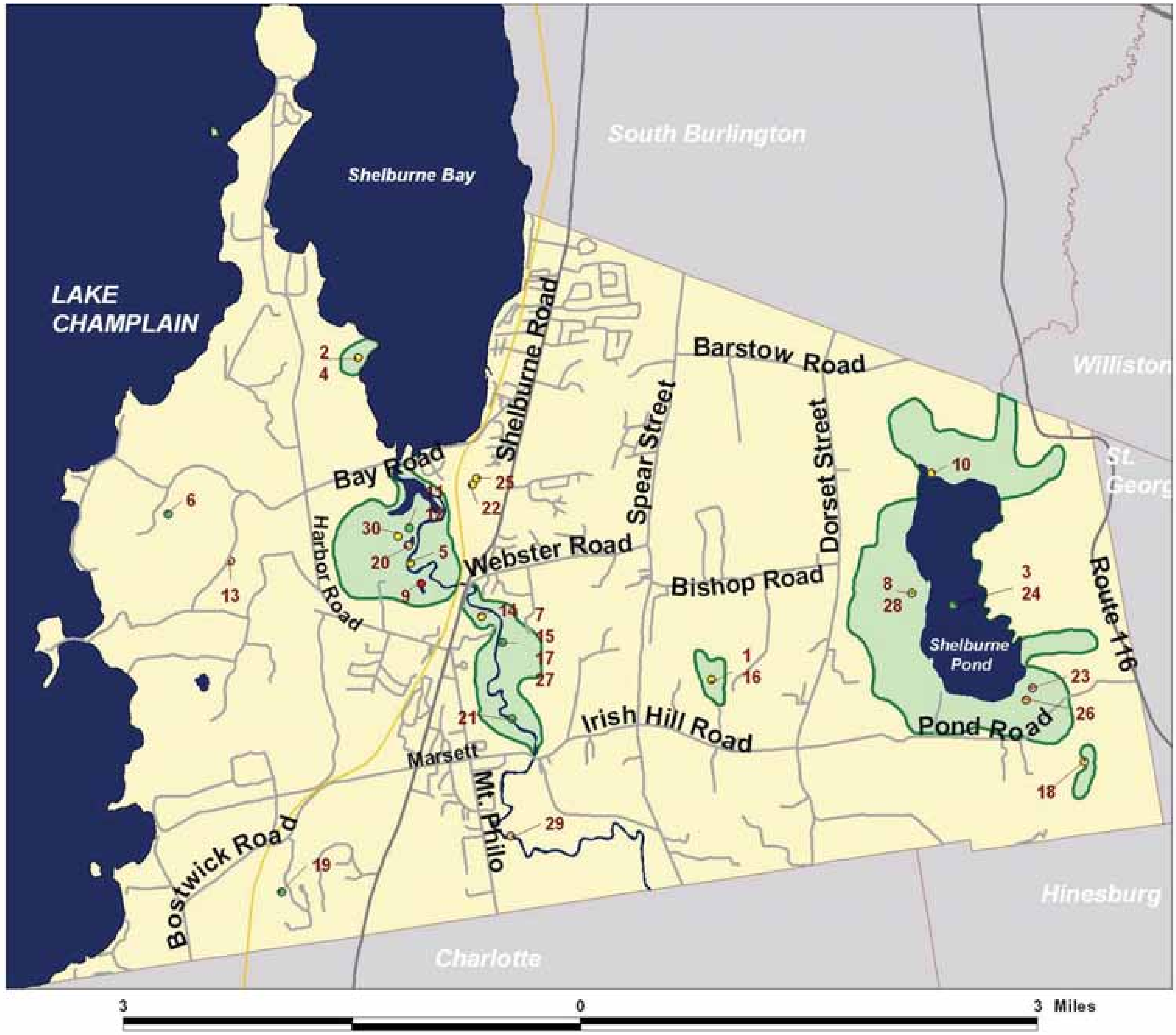
Natural Heritage Program Sites
- Invertebrate
- Natural Community
- Nonvascular plant
- Vascular plant
- Vertebrate

Biological Natural Area

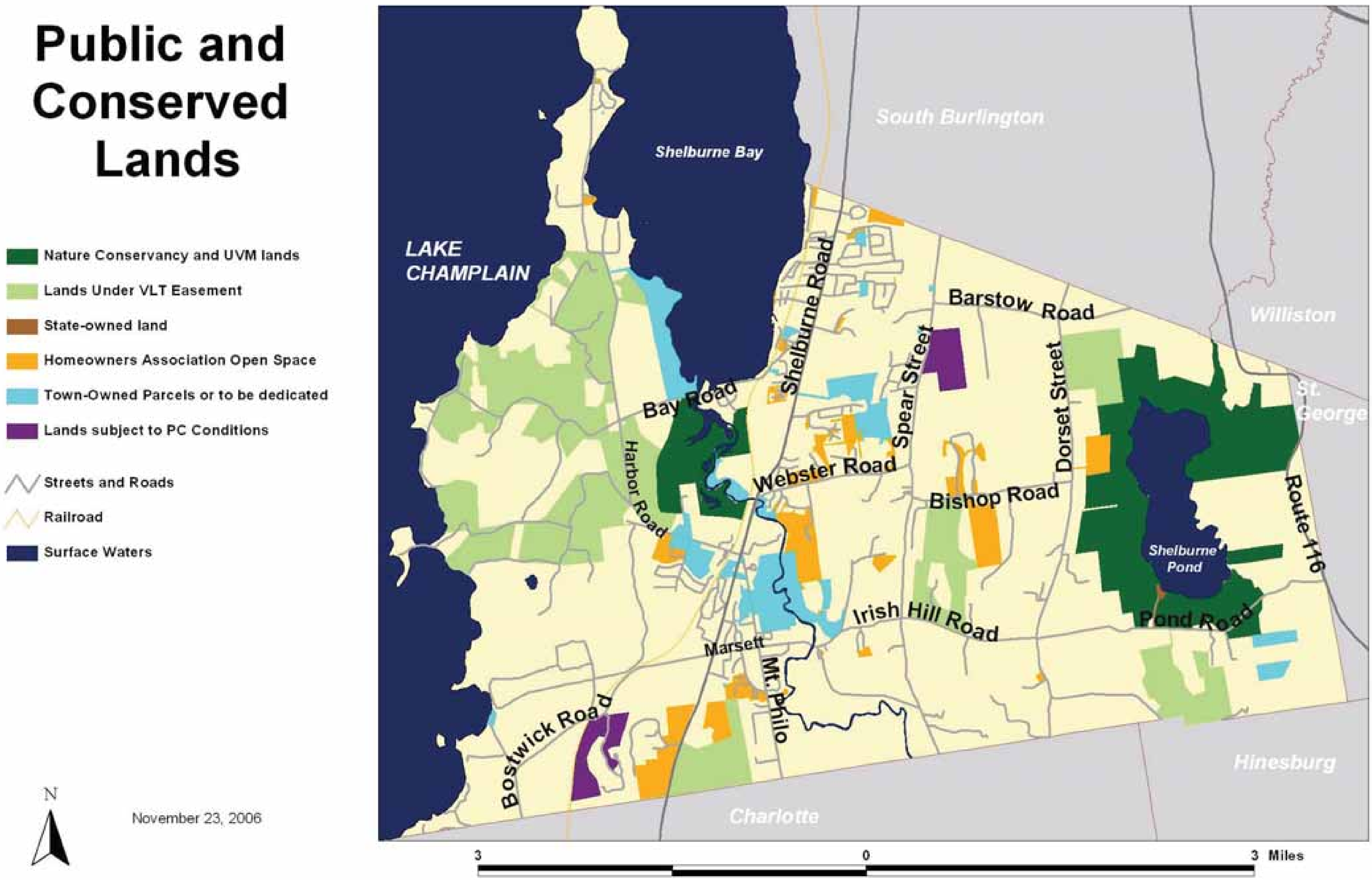
Surface Waters

SITE	TYPE	SIGNIFICANCE
1	Plant Dicot	S2S3
2	Plant Dicot	S2S3
3	Lacustrine Community	
4	Terrestrial Community	S3
5	Palustrine Community	S4
6	Plant Dicot	S2S3
7	Plant Dicot	S2
8	Plant Monocot	S1
9	Insect	S1S2
10	Palustrine Community	S4
11	Plant Monocot	S2
12	Plant Monocot	S2
13	Bird	S1B,S2N
14	Palustrine Community	S4
15	Palustrine Community	S3
16	Terrestrial Community	S3
17	Plant Dicot	S2
18	Palustrine Community	S4
19	Fern or Fern Ally	S2
20	Amphibian	S2
21	Plant Monocot	S3
22	Terrestrial Community	S3
23	Amphibian	S2
24	Plant Monocot	S2
25	Terrestrial Community	S3
26	Moss	S1
27	Plant Monocot	S1
28	Palustrine Community	S2
29	Fish	S1
30	Palustrine Community	S3

November 23, 2006



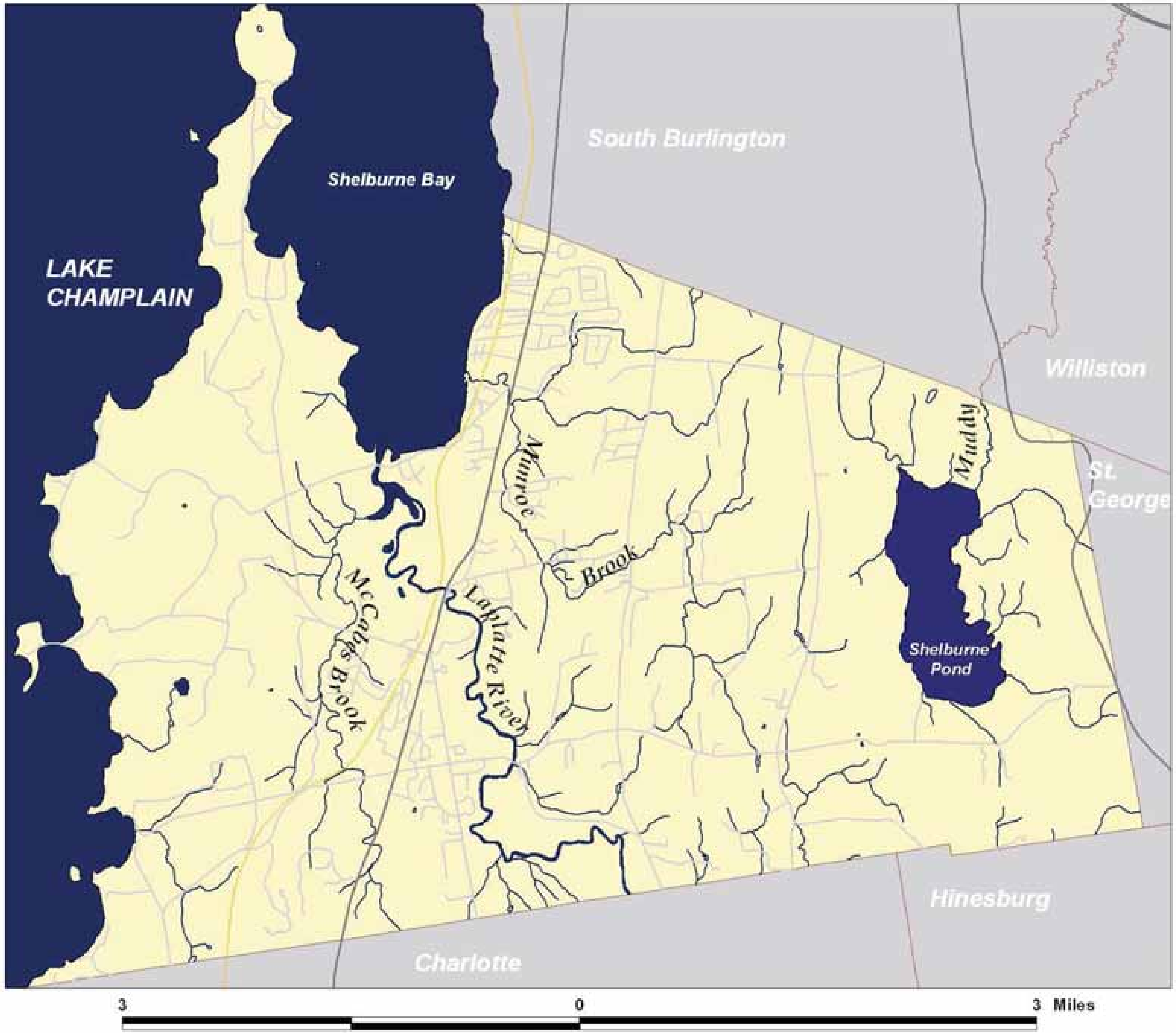
Public and Conserved Lands



November 23, 2006

Watercourses and Surface Waters

- Watercourses
- Other Surface Waters
- Streets and Roads
- Railroad



N

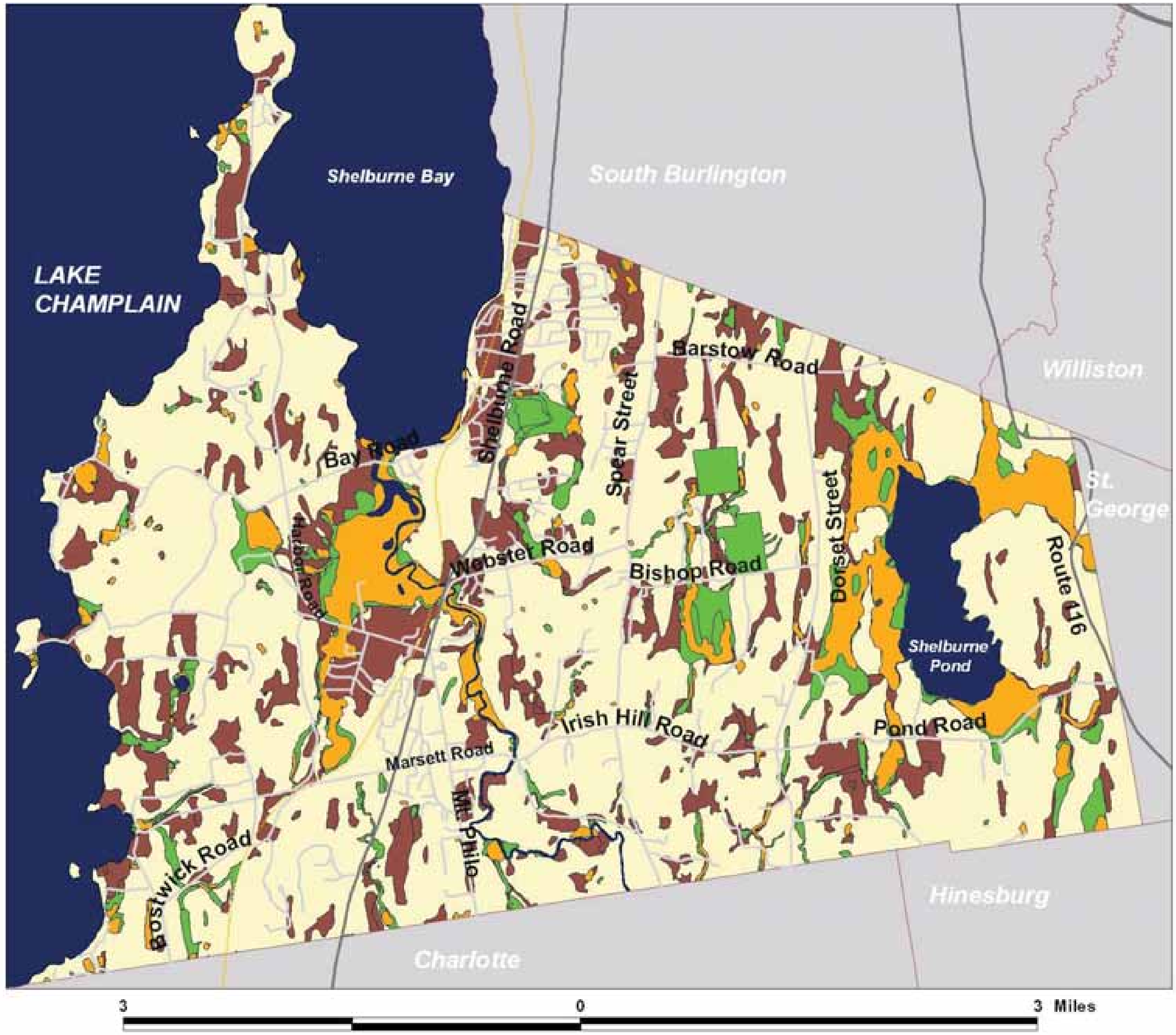
November 23, 2006

Wetlands and Hydric Soils

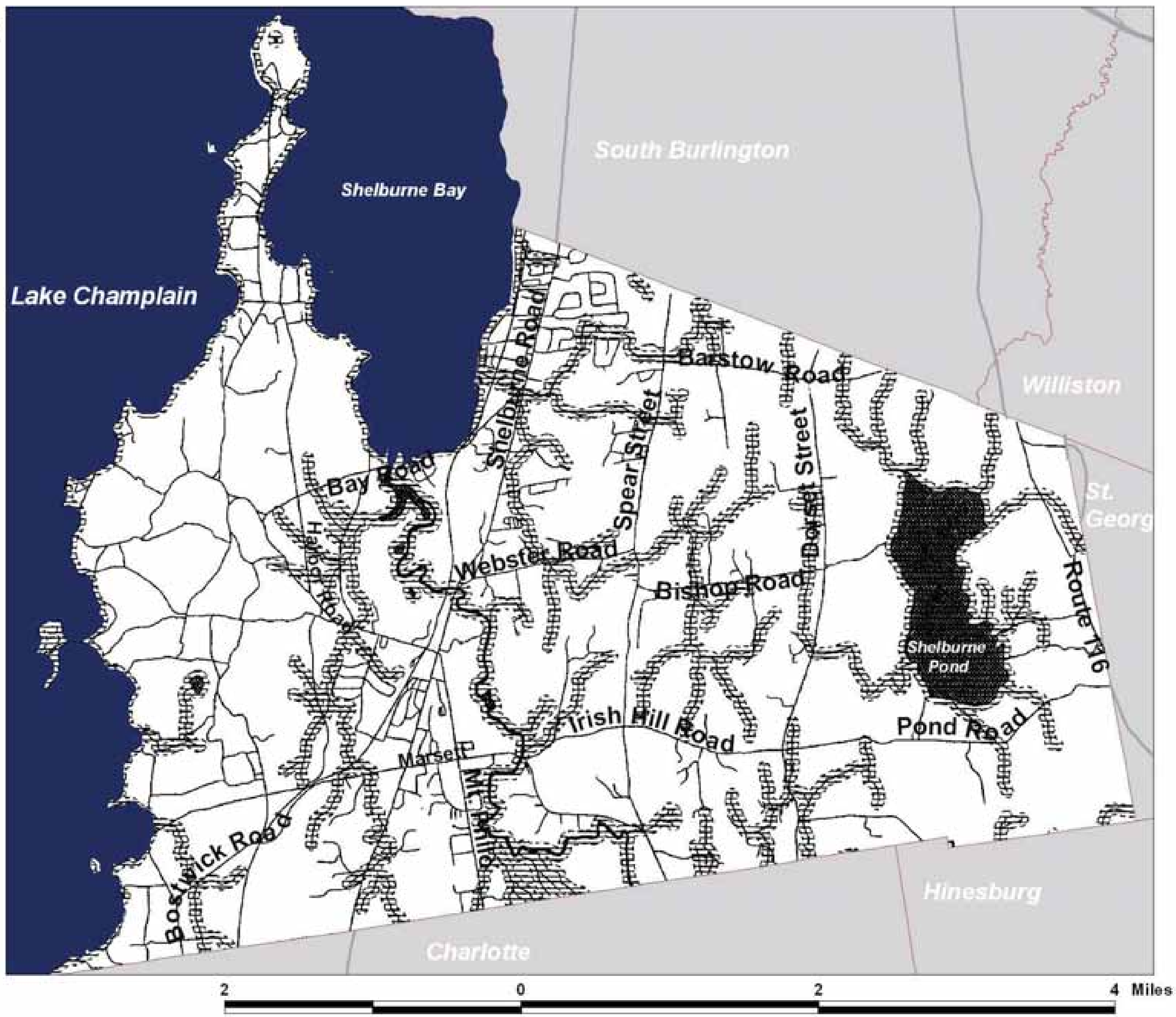
- Class II Wetlands
- Regional Study Wetlands
- Hydric Soils Not Classified as Wetlands
- Streets and Roads
- Railroad
- Surface Waters

N

November 23, 2006



Archeologically Sensistive Areas



LEGEND

- ARCHEOLOGICAL SENSITIVITY AREA
- MAJOR WATER BODY
- TOWN BOUNDARY
- ROAD
- STREAM OR RIVER

This Map is Intended For Planning Purposes Only. Information for this Archeological Sensitivity Areas Map was provided by the Vermont Division for Historic Preservation. This map highlights area of potential prehistoric settlement sites only. In order to confirm a prehistoric settlement site, an on-site investigation must be uncertaken. This map may not show all area of potential prehistoric settlement sites. For more detailed information refer to the 1990 report entitled Preliminary Archeological Overview for the Town of Shelburne, VT or contact the Vermont Division for Historic Preservation, Montpelier, VT.

SOURCES:

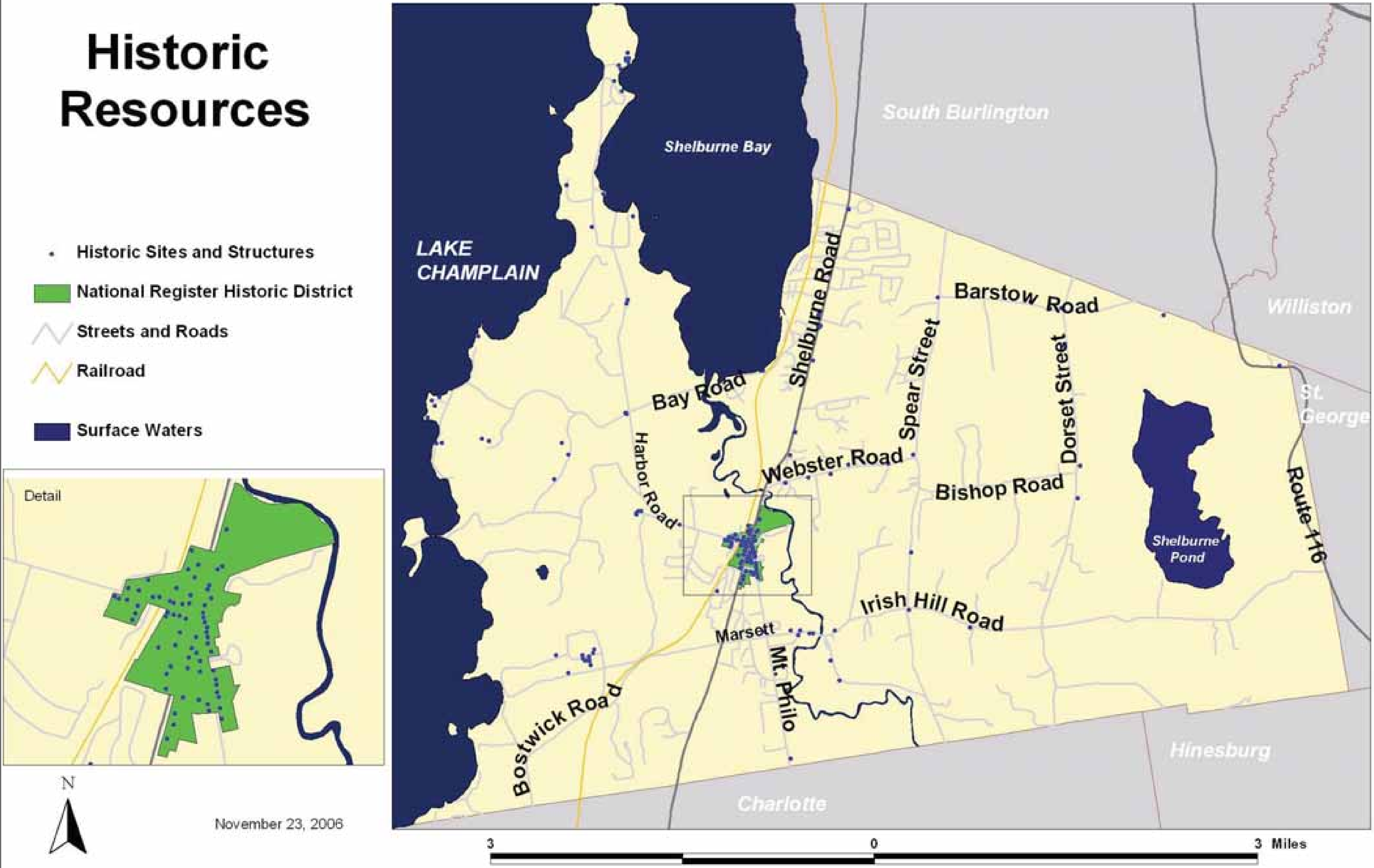
Archeological Sensitivity Areas were derived from 1:20,000 scale orthophoto data and are based on information provided by the Vermont Division For Historic Preservation.
Surface water was digitized from 1978 1:20,000 scale orthophotos
Roads were digitized from 1978 1:20,000 scale orthophotos.

November 23, 2006

N

Based on a map prepared for Shelburne
by Associates in Rural Development

Historic Resources



November 23, 2006

Significant Views

SIGNIFICANT VIEW SHADE SYMBOLS

- Foreground area of primary view
- Foreground area of secondary view

SIGNIFICANT VIEW LINE SYMBOLS

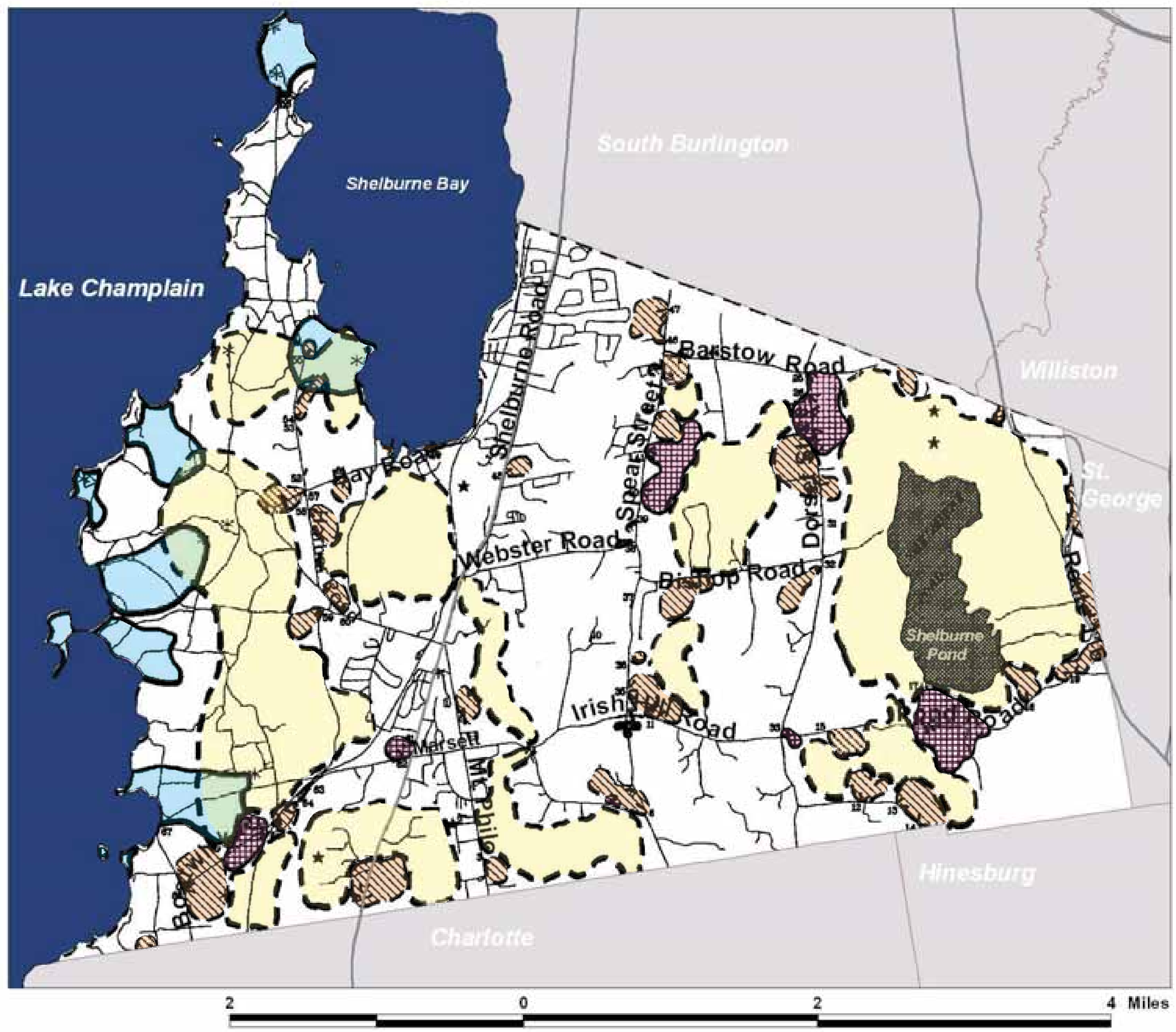
- Foreground area of primary view
- Foreground area of secondary view
- Middleground area - General for all views
- Middleground area of views from water

OTHER LINE SYMBOLS

- Road
- Town Boundary

SIGNIFICANT VIEW POINT SYMBOLS

- * View focal point
- ★ Significant view
- "24" Significant view from public road

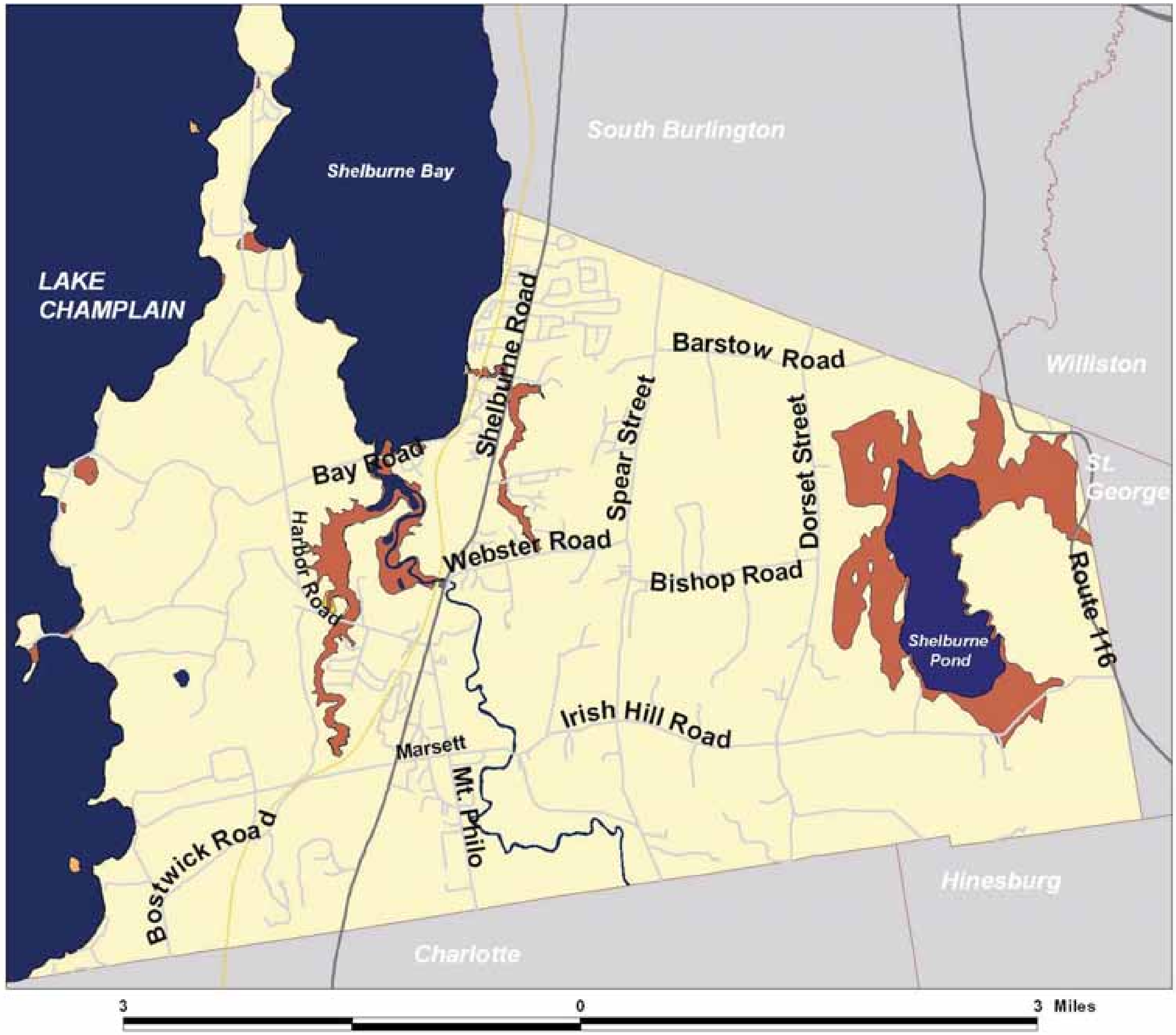


November 23, 2006

N

Based on a map prepared for Shelburne by Associates in Rural Development

Flood Hazard Areas



Flood Hazard Zone

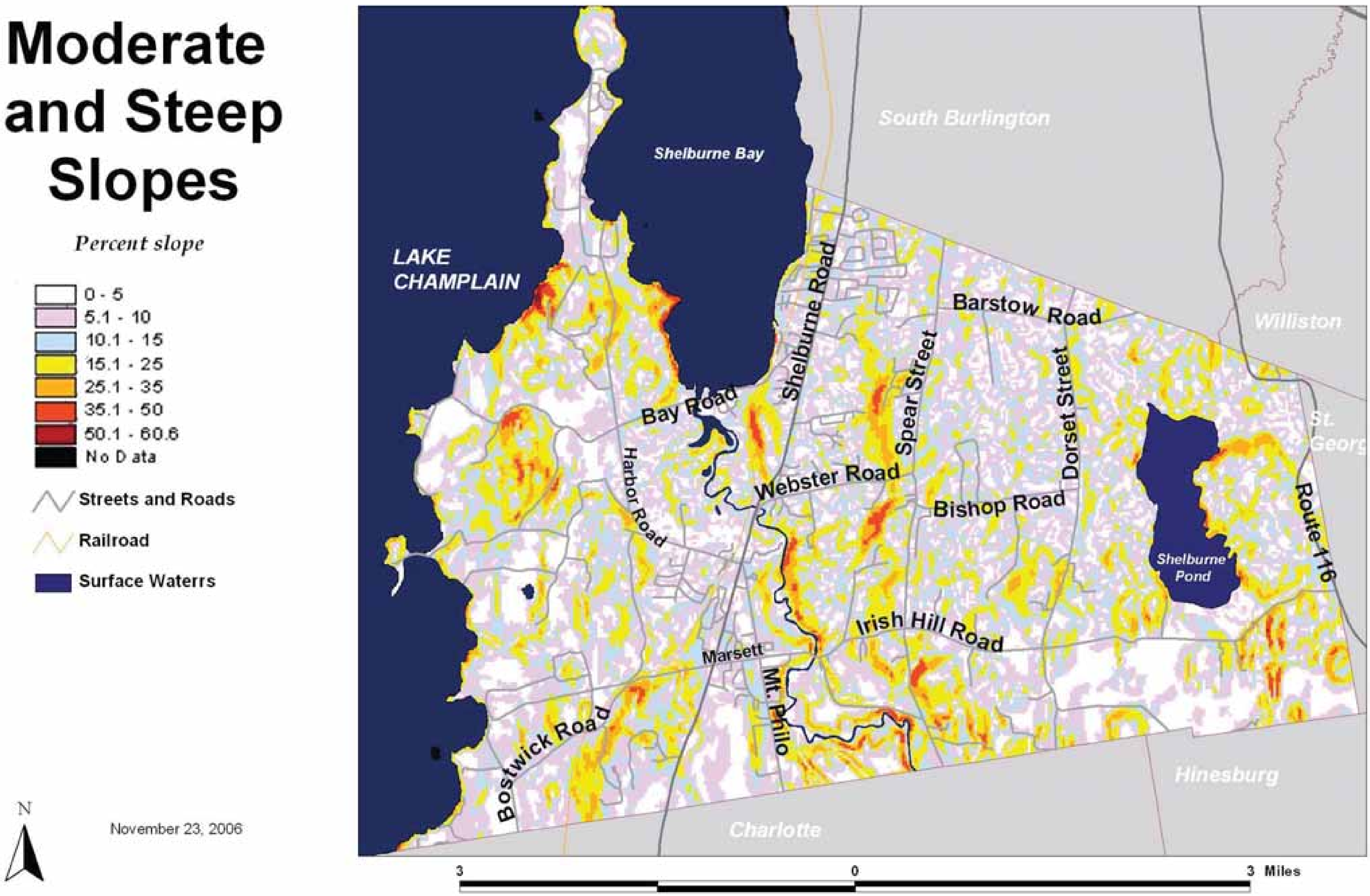
- A Zone
- B Zone
- Lake
- Streets and Roads
- Railroad
- Surface Waters

Flood hazard area mapping in the Town of Shelburne is incomplete. State Floodplain Management staff should be consulted to determine location of additional Flood hazard areas.

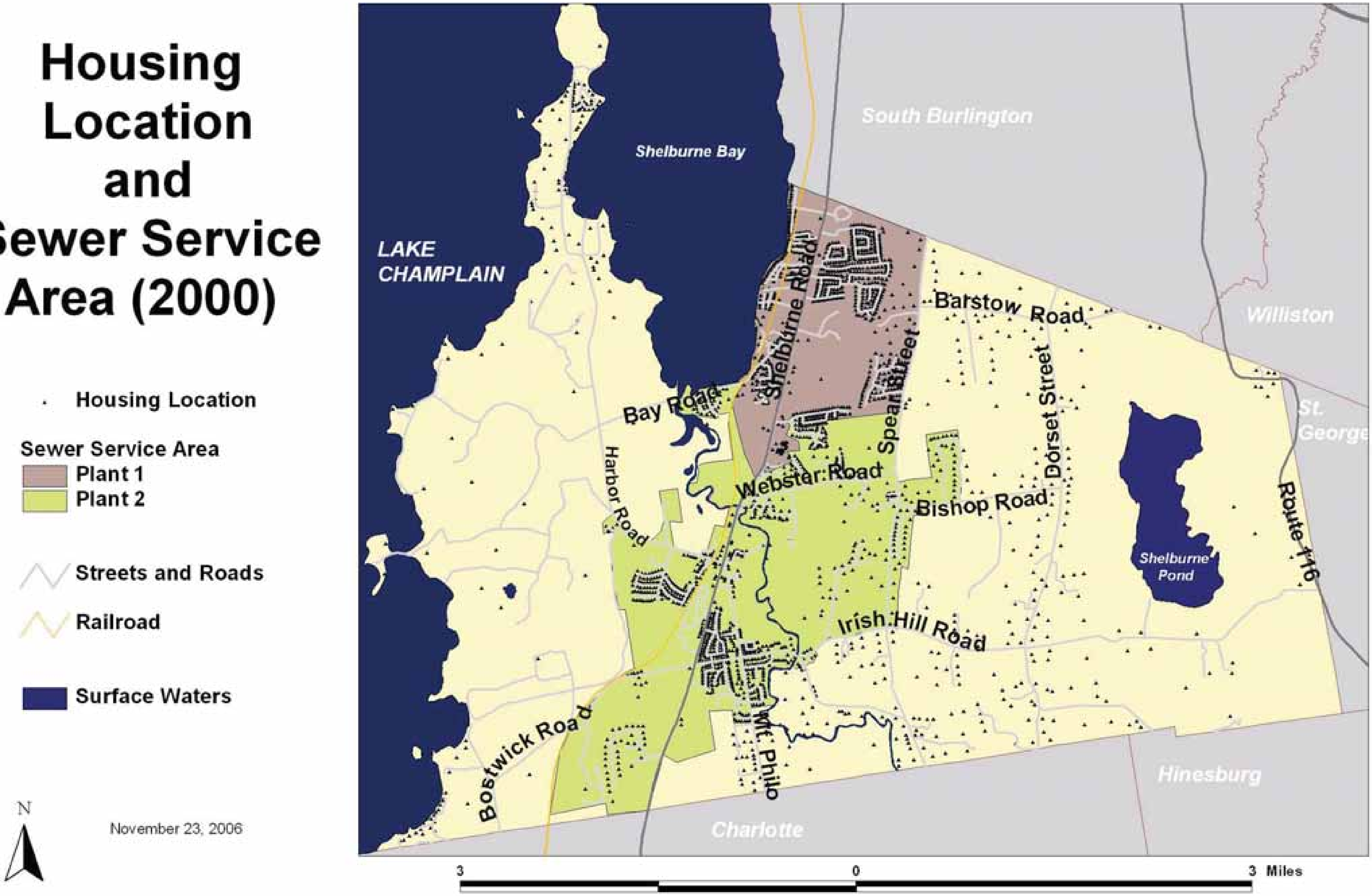
N

November 23, 2006

Moderate and Steep Slopes



Housing Location and Sewer Service Area (2000)



November 23, 2006

Daily Traffic Volumes

and

Functional Classification

Traffic Count Location and Count Range

- 0 - 1000
- 1001 - 2500
- 2501 - 5000
- 5001 - 10000
- over 10000
- Local Streets and Higways
- Railroad
- Bridges.shp

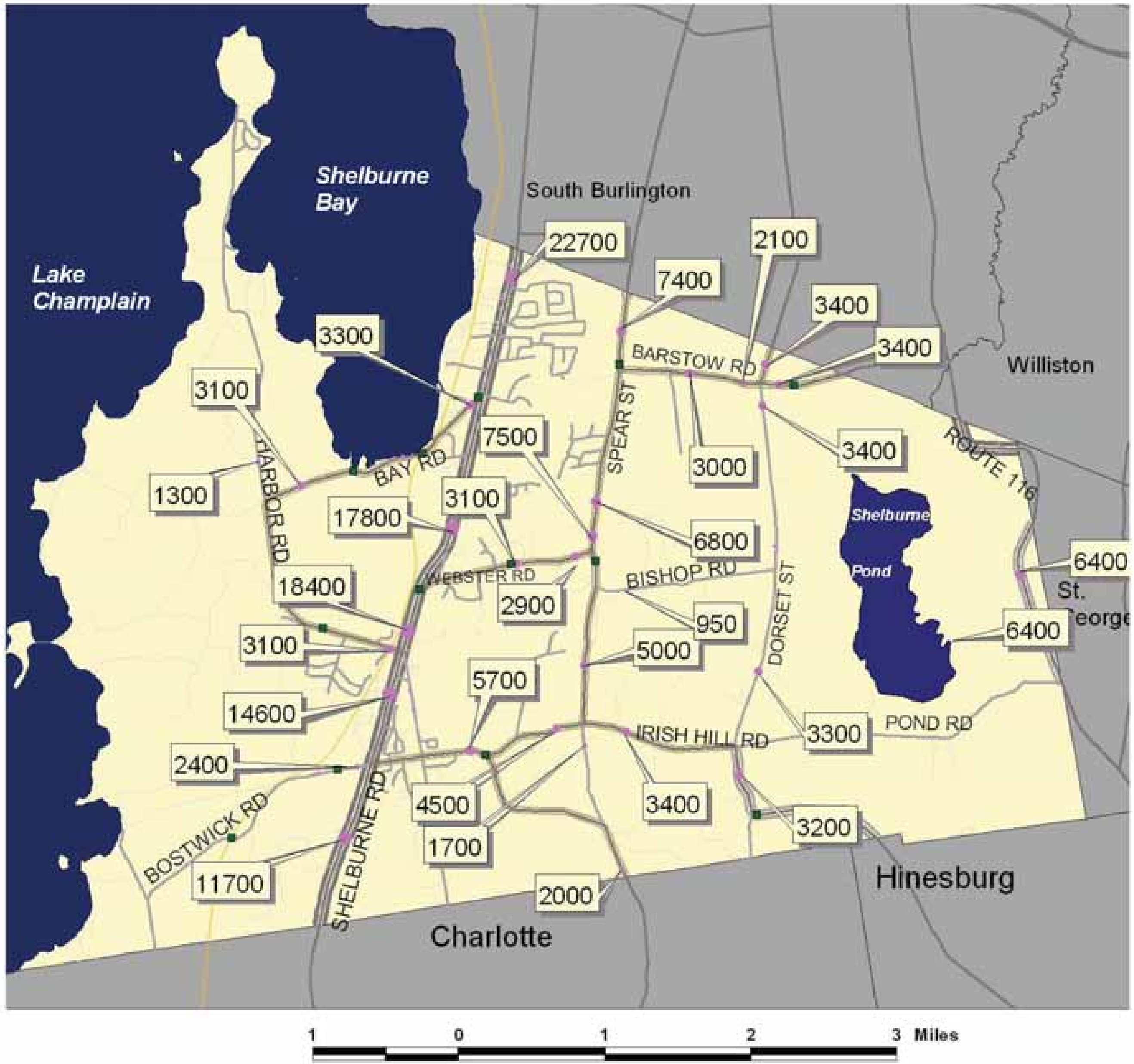
Functional Classification

- Urban Principal Arterial
- Urban Minor Arterial
- Urban Collector

- Surface Waters

N

November 23, 2006



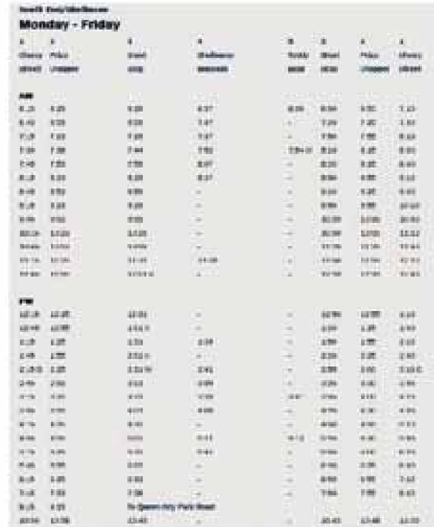
Public Transit Routes and Schedules

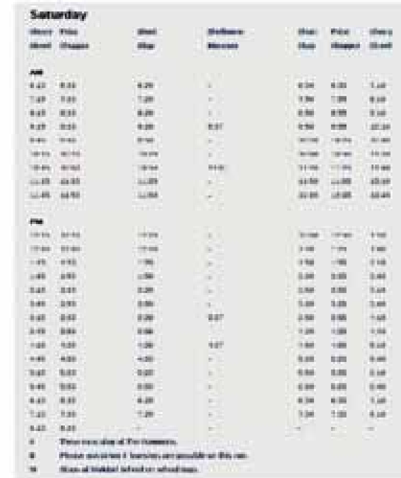
Adapted from maps prepared by CCTA.

November 23, 2006

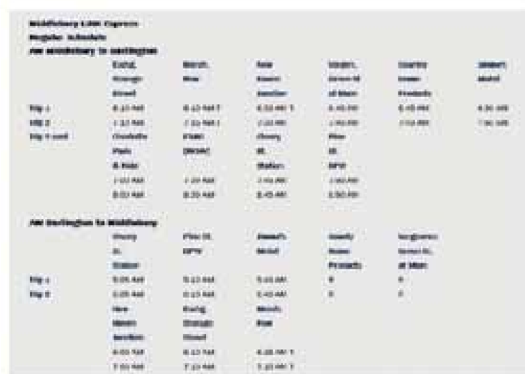
N

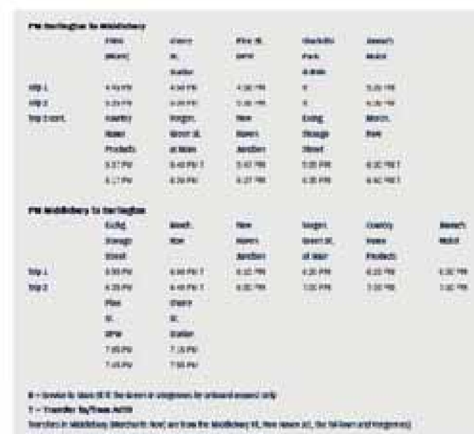
South End/Shelburne Route





Regional "Link Express" Route



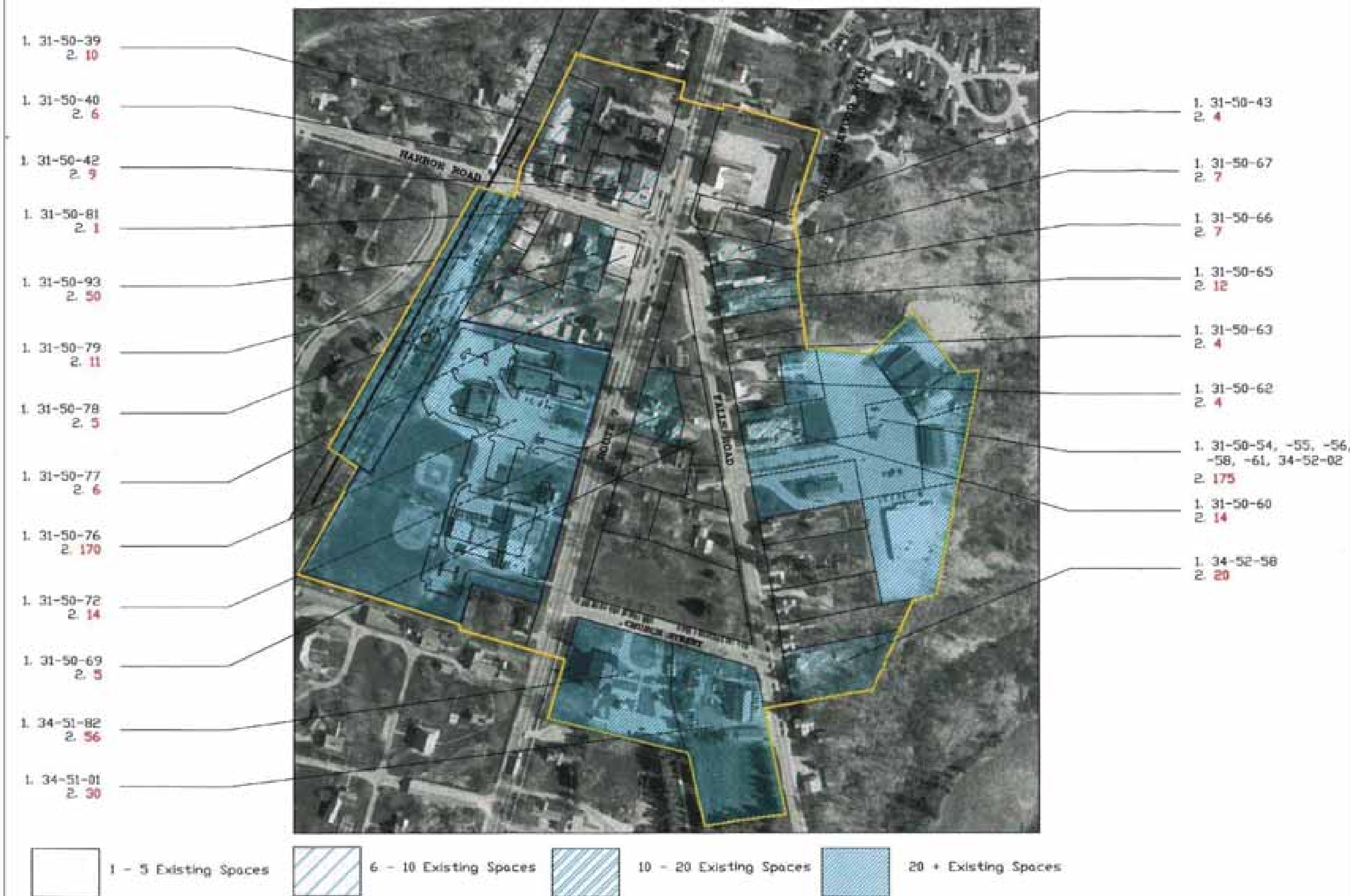


Parking Supply in Village Core and Environs, 2000

LEGEND

STUDY AREA

1. Parcel Number
2. Existing Number of Parking Spaces (Excludes Residential Property)

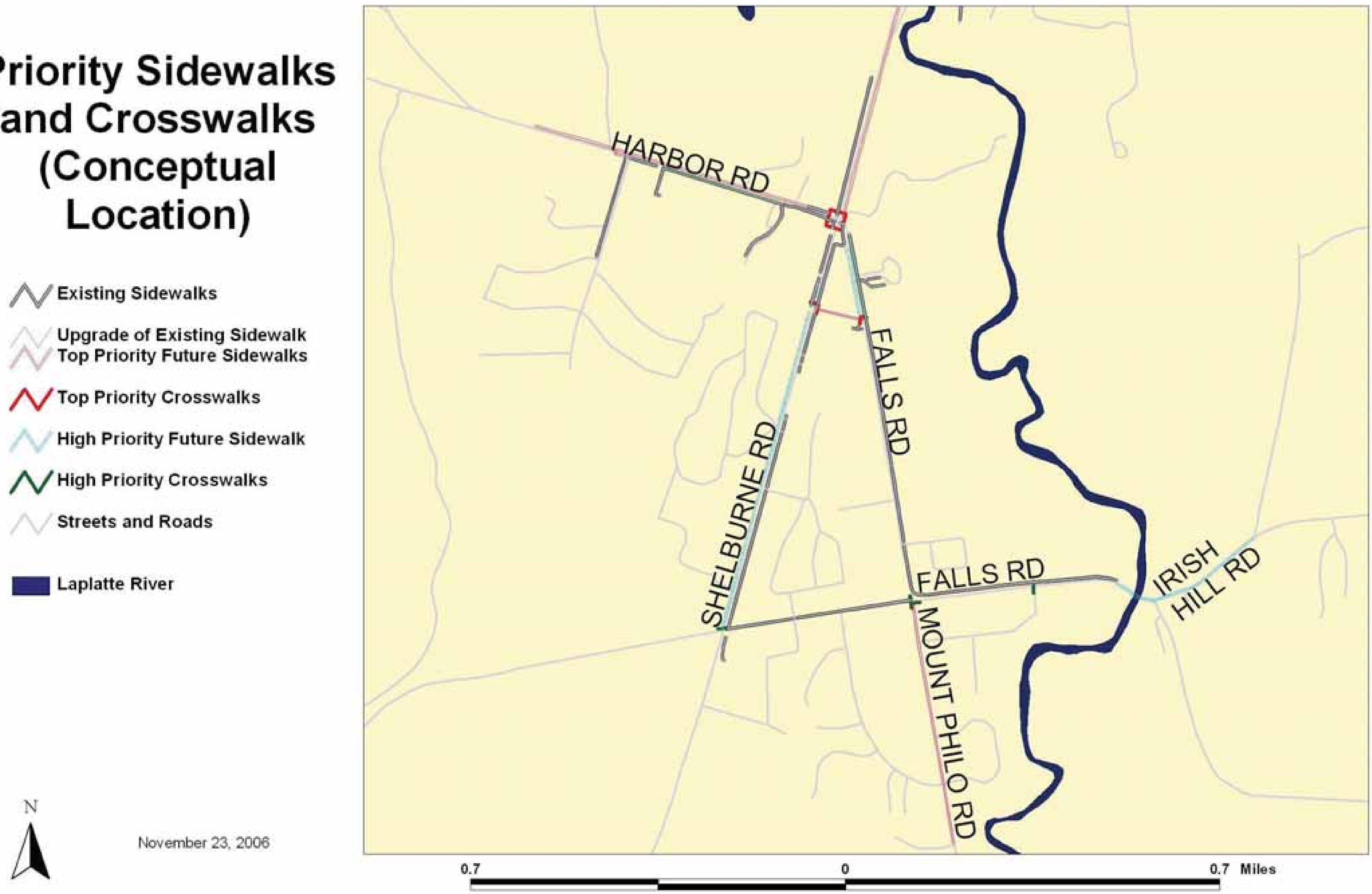


Adapted from a map prepared for the Town by Lamoureaux and Dickinson Consulting Engineers

N

November 23, 2006

Priority Sidewalks and Crosswalks (Conceptual Location)



Priority Paths, Trails, and Lanes

Existing Shared Use Paths
Shelburne Bay Park Trails

Existing Village Sidewalks

Route 7 Sidewalks
Route 7 On-Road Lanes

Top Priority Multi-Use Paths
Longmeadow-Webster Road Path Route
'Village to Beach' Conceptual Corridor
Ti Haul Trail Connector

High Priority Multi-Use Paths
Harbor Road and Bay Road paths

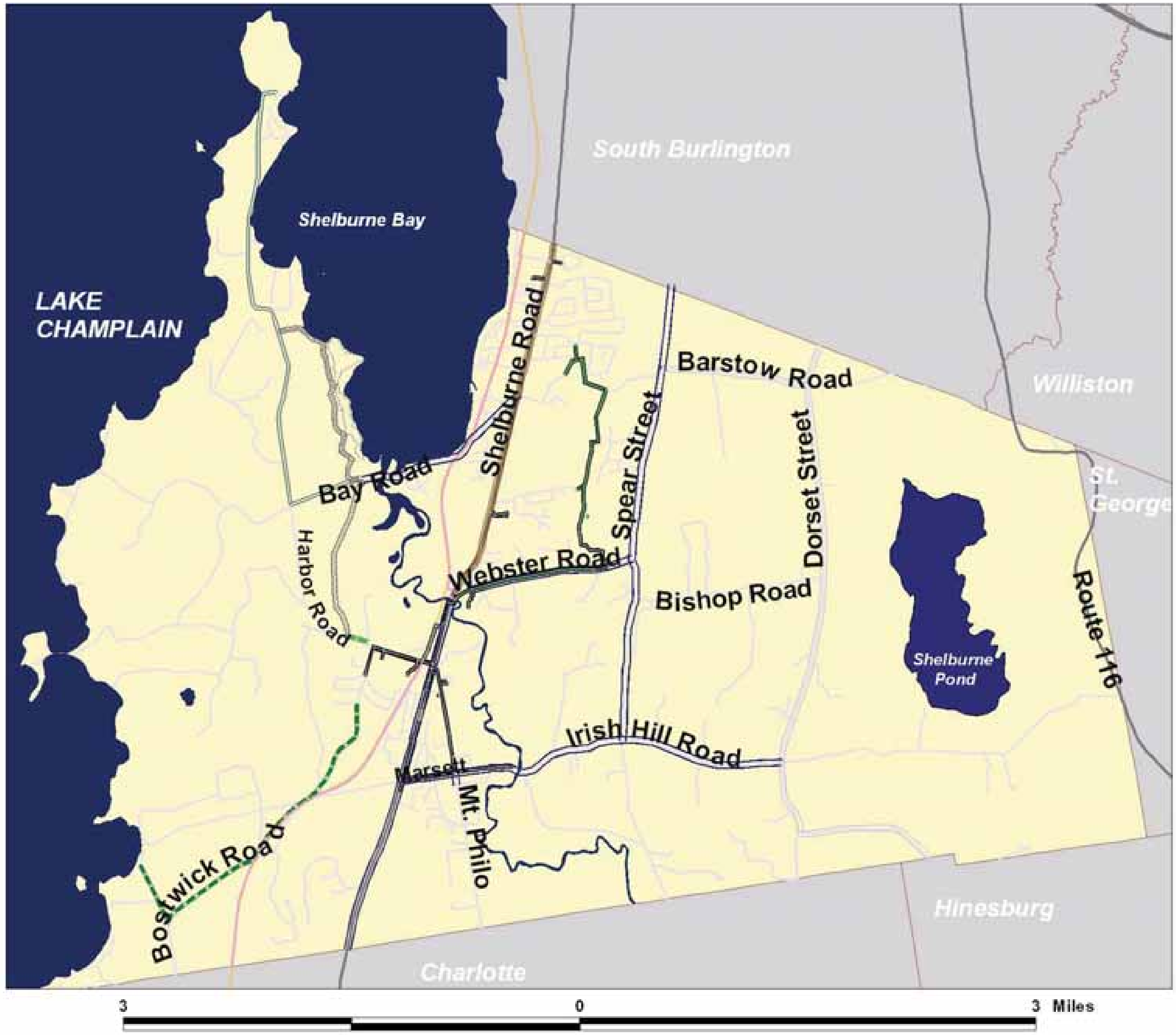
Top Priority On-Road facilities
High Priority On-Road facilities

Champlain Rail with Trail Corridor

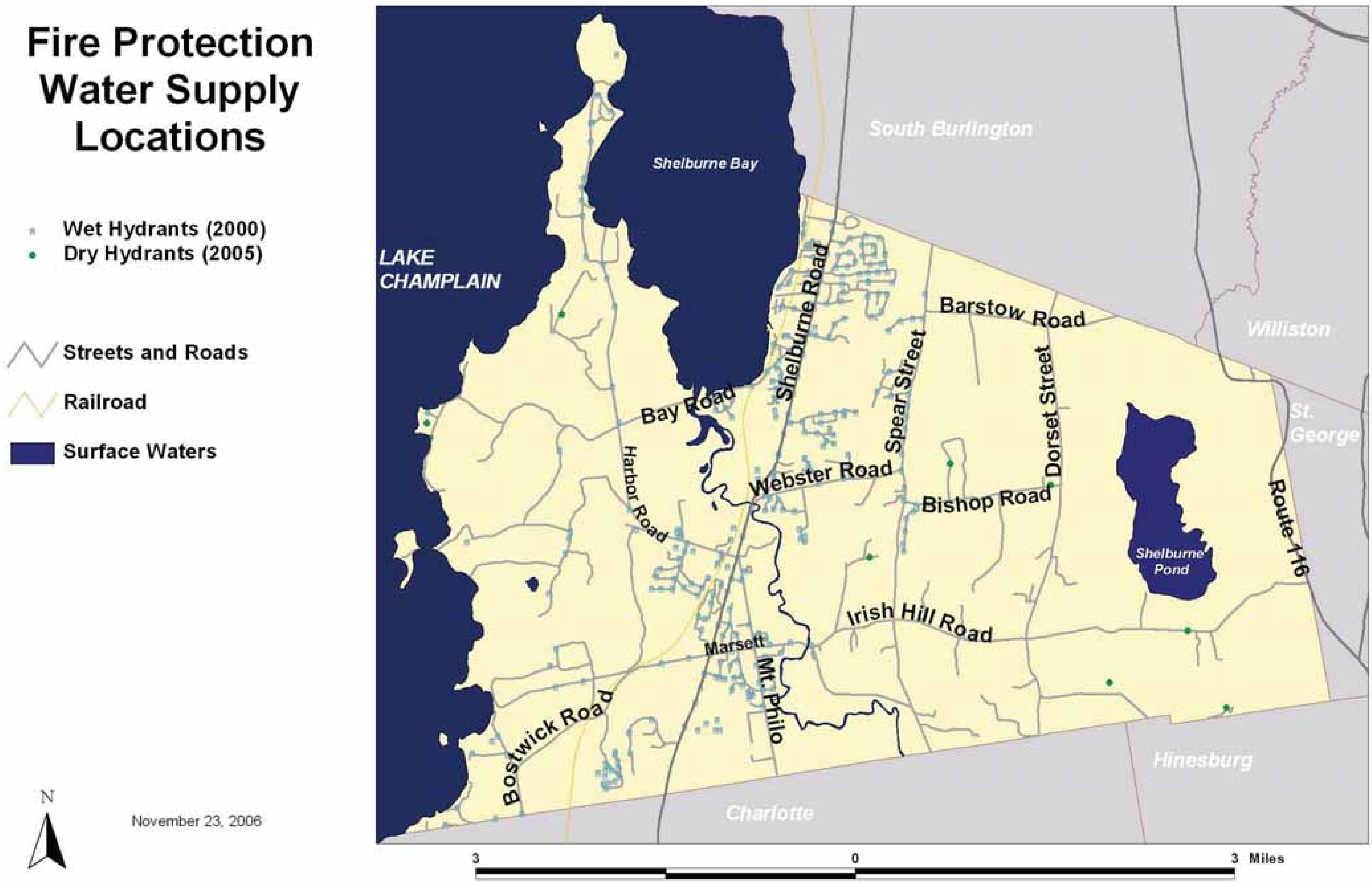
Streets and Roads
Railroad

N

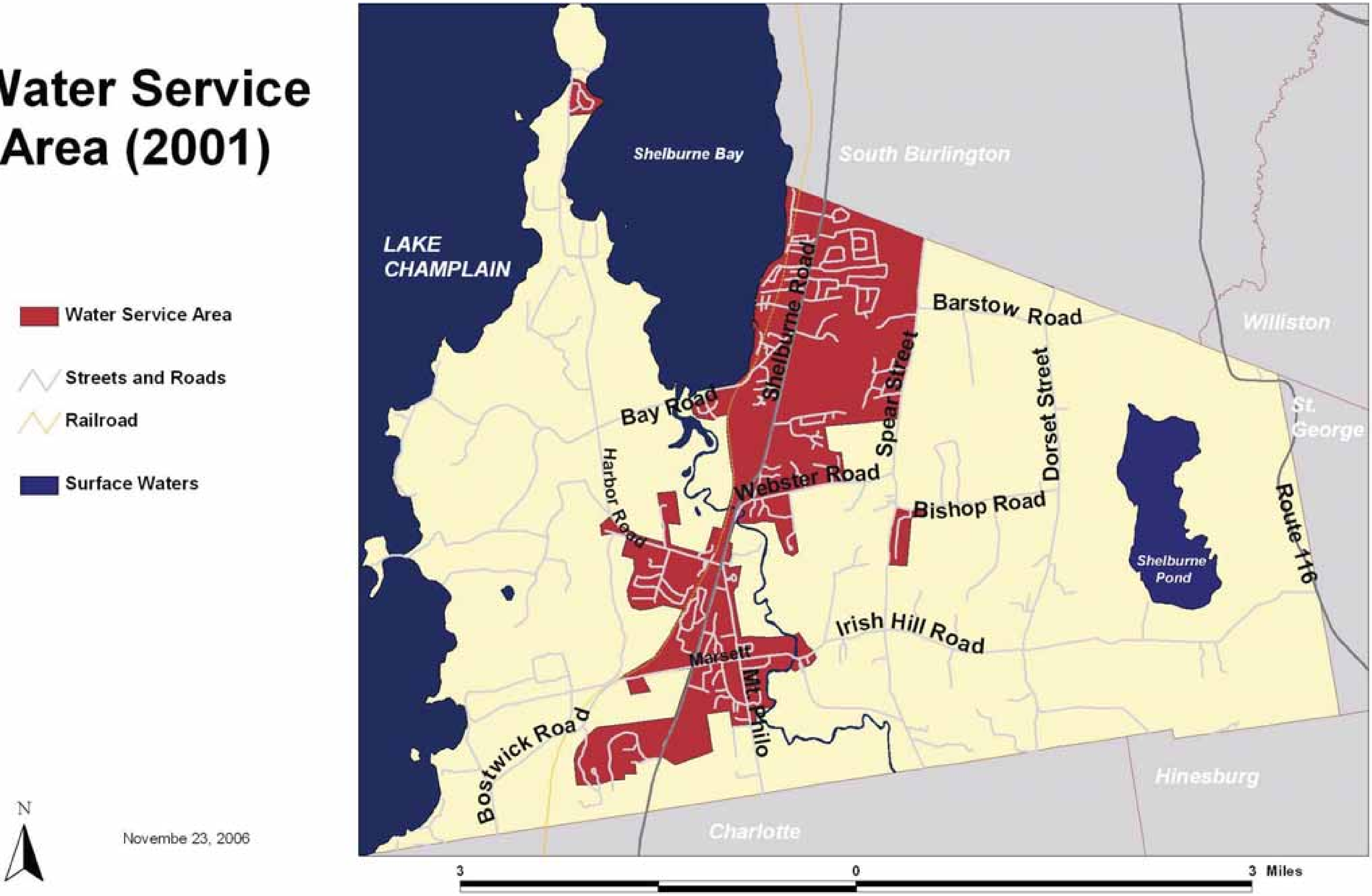
November 23, 2006



Fire Protection Water Supply Locations

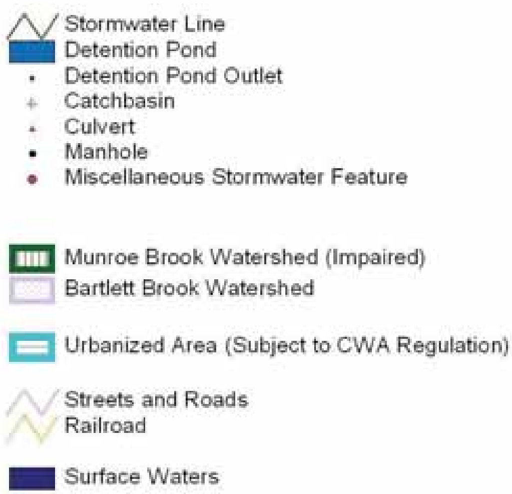


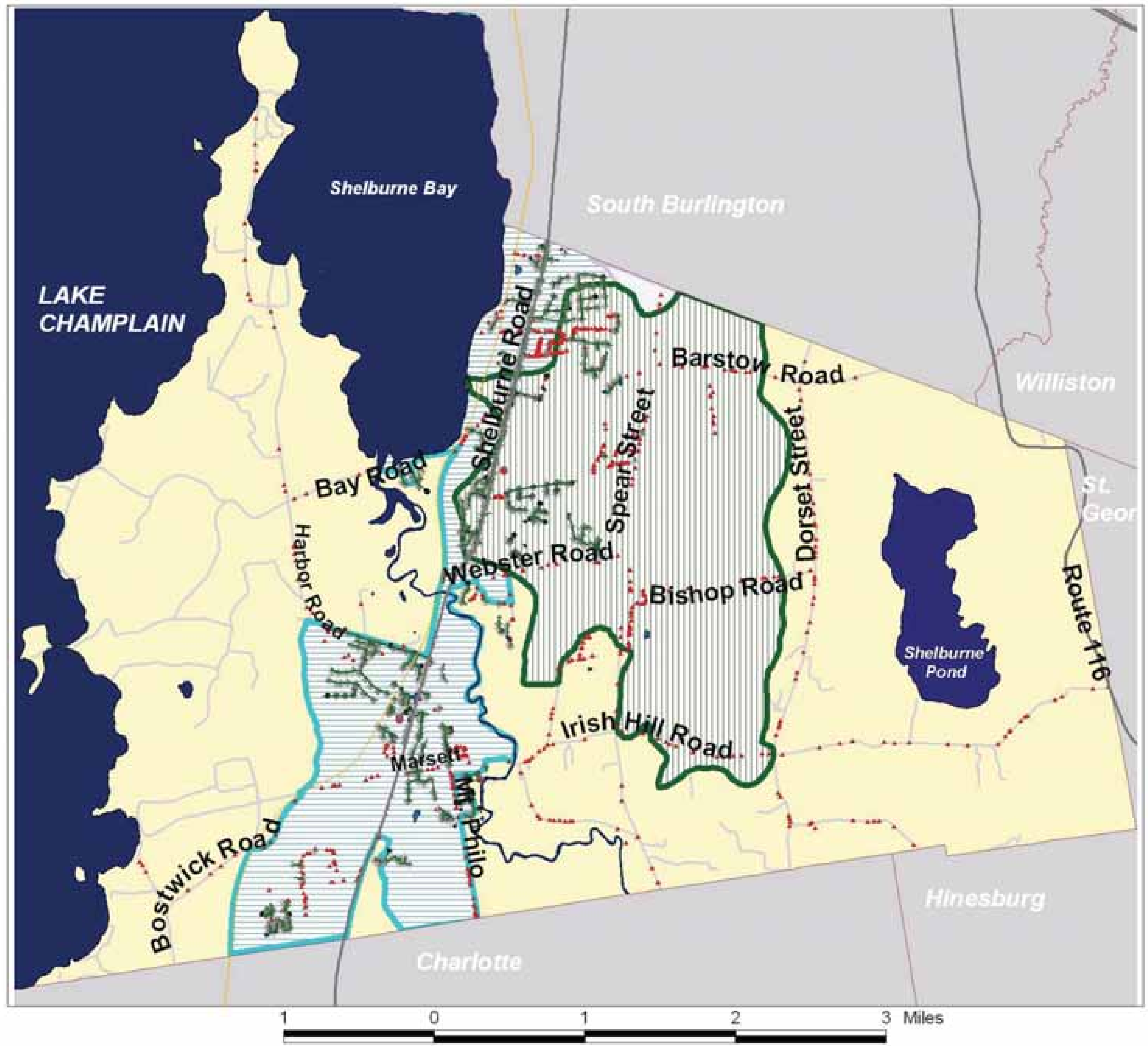
Water Service Area (2001)



Novembe 23, 2006

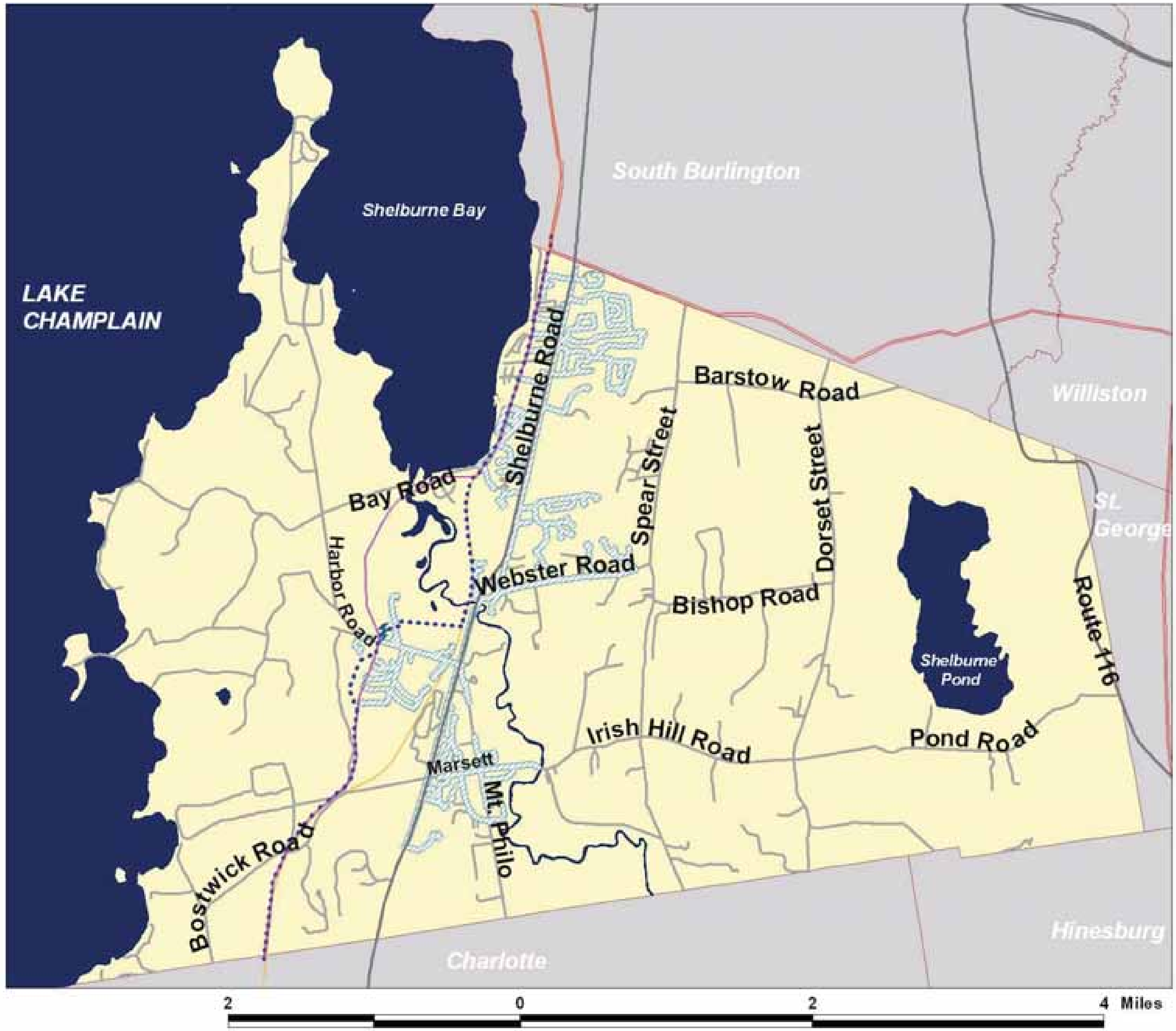
Stormwater Infrastructure, Impaired Watersheds, and Other Regulatory Boundaries





November 23, 2006

Existing and Proposed Electrical Transmission Facilities and Natural Gas Service Area



Existing Green Mountain Power Transmission Line
Existing VELCO Transmission Line

Substation

Approx. Location, Future VELCO Corridor

Vermont Gas Service (approx)

Streets and Roads

Railroad

Surface Waters

N

November 23, 2006

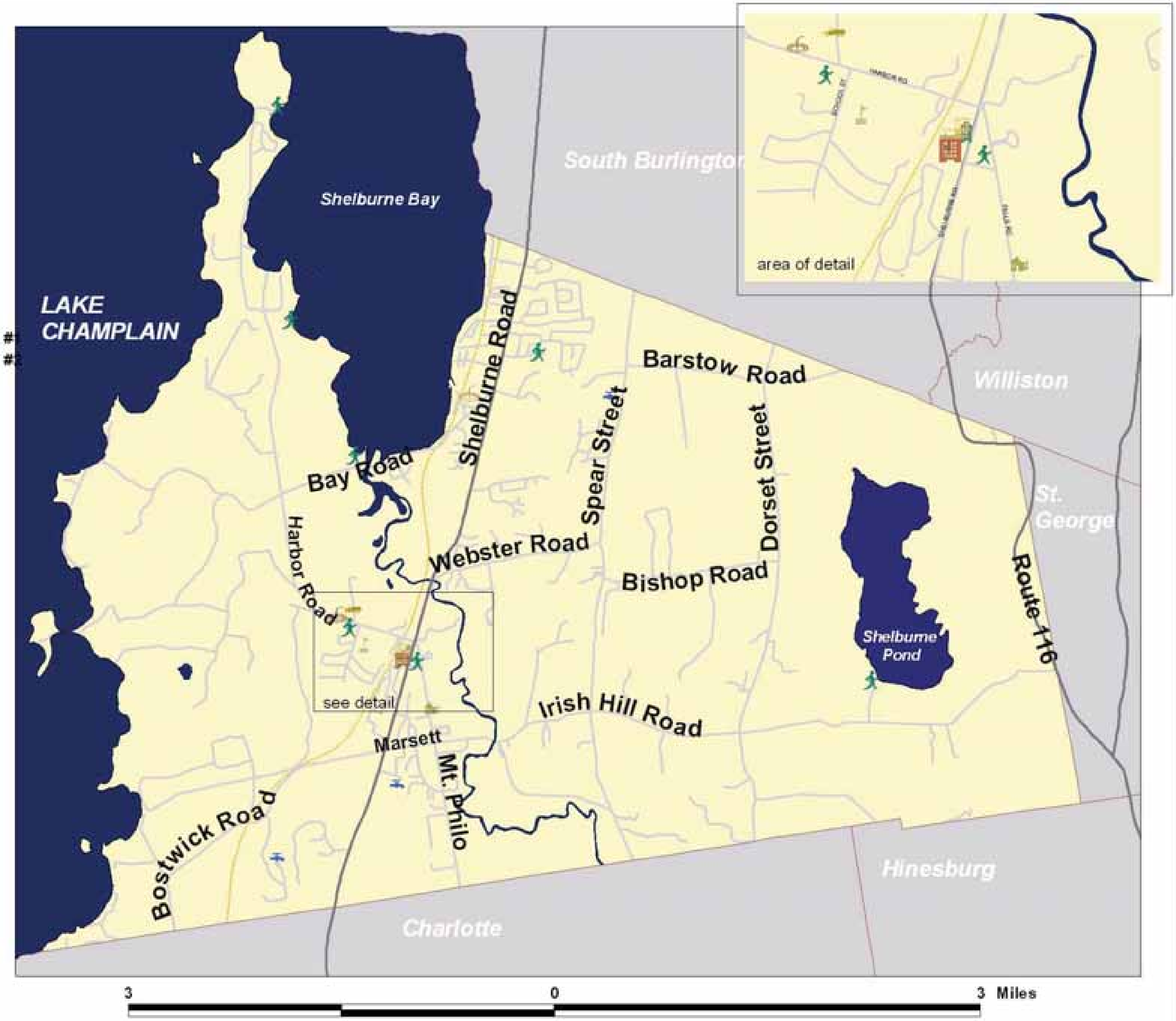
Public Facilities

- MUNICIPAL CENTER
- SHELBURNE FIRE STATION
- SHELBURNE LIBRARY
- SHELBURNE COMMUNITY SCHOOL
- SHELBURNE POLICE DEPARTMENT
- SHELBURNE POST OFFICE
- SHELBURNE SEWAGE TREATMENT PLANT #1
- SHELBURNE SEWAGE TREATMENT PLANT #2
- SHELBURNE TOWN GARAGE
- SHELBURNE TOWN HALL
- WATER TANK
- RECREATION FACILITY/PARK

- Streets and Roads
- Railroad
- Surface Waters

N

November 23, 2006

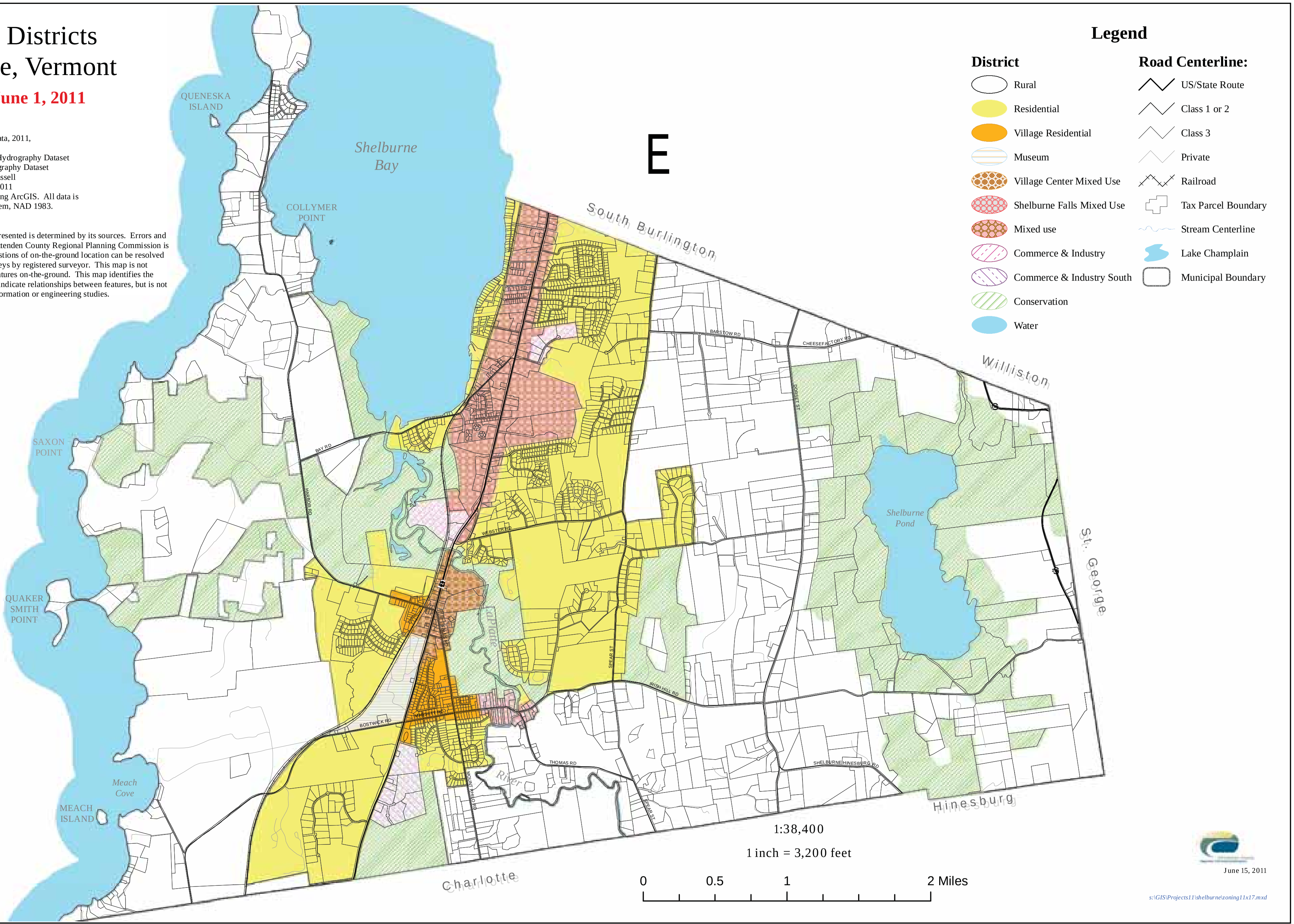


Zoning Districts
Shelburne, Vermont

Effective June 1, 2011

Sources:
Road Centerline - e911 road data, 2011,
Railroad - VTrans data
Stream Centerline - Vermont Hydrography Dataset
Water Body - Vermont Hydrography Dataset
Parcel Boundary - 2011, D. Russell
Zoning - updated by CCRPC 2011
Map created by P. Brangan using ArcGIS. All data is in State Plane Coordinate System, NAD 1983.

Disclaimer:
The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Chittenden County Regional Planning Commission is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by registered surveyor. This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.



Vertmont Agency of Transportation

Date: 06/28/2012

General Yearly Summaries - Crash Listing: State Highways and All Federal Aid Highway Systems

From 01/01/07 To 12/31/11 General Yearly Summaries Information

*	Reporting Agency/ Number	Town	Mile Marker	Date MM/DD/YY	Time	Weather	Contributing Circumstances	Direction Of Collision	Number Of Injuries	Number Of Fatalities	Direction	Road Group
Route: US-7												
	0413/14516-07	Shelburne	1.17	11/16/2007	15:34	Cloudy	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner, Other improper action, No improper driving	Same Direction Sideswipe	0	0	S	SH
	VT0040700/08SH0 2027	Shelburne	1.17	09/08/2008	05:10	Cloudy	Followed too closely, No improper driving	Rear End	1	0	N	SH
	VT0040700/09SH0 2249	Shelburne	1.17	11/10/2009	10:01	Clear	Inattention, No improper driving	Rear End	1	0	S	SH
	VT0040700/09SH0 2375	Shelburne	1.17	11/25/2009	17:18	Clear	Unknown, No improper driving	Rear End	0	0	S	SH
	VT0040700/10SH0 0771	Shelburne	1.17	04/26/2010	08:15	Clear	Inattention, No improper driving	Rear End	0	0	S	SH
	VT0040700/10SH0 1272	Shelburne	1.17	06/24/2010		Rain	Driving too fast for conditions, No improper driving	Rear End	0	0		SH
	VT0040700/11SH0 0291	Shelburne	1.17	02/10/2011	08:53	Clear	Inattention, No improper driving	Rear End	0	0	N	SH
	VT0040700/11SH- 0045	Shelburne	1.17	03/04/2011	10:24	Unknown	Disregarded traffic signs, signals, road markings, No improper driving	No Turns, Thru moves only, Broadside ^<	0	0		SH
	VT0040700/09SH0 2026	Shelburne	1.21	10/11/2009	17:03	Clear	Followed too closely, Inattention, No improper driving	Rear End	0	0	S	SH
	VT0040700/10SH0 2222	Shelburne	1.25	10/08/2010	17:50	Clear	Distracted, Unknown	Rear End	0	0	S	SH
	VT0040700/11SH0 1362	Shelburne	1.25	07/08/2011	17:20	Clear		Same Direction Sideswipe	0	0		SH
	VT0040700/11SH0 2298	Shelburne	1.25	11/12/2011	16:44	Cloudy	Followed too closely, Distracted, No improper driving	Rear End	4	0	N	SH
	VT0040700/09SH0 1373	Shelburne	1.26	07/23/2009	11:05	Clear	No improper driving, Inattention	Rear End	0	0	N	SH
	VT0040700/09SH0 1533	Shelburne	1.26	08/09/2009	13:50	Clear	Followed too closely, Distracted, No improper driving	Rear End	0	0	N	SH
	VT0040700/10SH0 1060	Shelburne	1.26	04/01/2010	08:36	Rain	Unknown, No improper driving	Rear End	0	0	N	SH
	VT0040700/10SH0 0745	Shelburne	1.26	04/22/2010	16:54	Cloudy	Failed to yield right of way	Rear End	2	0	S	SH
	VT0040700/10SH0 124	Shelburne	1.26	06/22/2010	12:45	Unknown	Inattention	Rear End	0	0		SH
	VT0040700/10SH0 1886	Shelburne	1.26	08/31/2010	15:41	Clear	Distracted, Inattention, No improper driving	Rear End	0	0		SH
	VT0040700/10SH0 1888	Shelburne	1.26	08/31/2010	16:18	Clear	Distracted, No improper driving	Rear End	0	0	S	SH
	VT0040700/11SH0 1527	Shelburne	1.26	07/29/2011	18:05	Rain	Driving too fast for conditions, Followed too closely, No improper driving	Rear End	0	0	N	SH
	0413/11766-07	Shelburne	1.29	09/14/2007	16:12	Clear	Inattention, No improper driving	Rear End	0	0	S	SH
	VT0040700/11SH0 2062	Shelburne	1.32	10/08/2011	15:49	Clear	Distracted, No improper driving	Rear End	0	0	N	SH
	VT0040700/10SH6 1986	Shelburne	1.35	09/11/2010	15:00	Clear	Driving too fast for conditions, Fatigued, asleep, No improper driving	No Turns, Thru moves only, Broadside ^<	1	0	S	SH
	VT0040700/11SH0 1849	Shelburne	1.35	09/12/2011	17:00	Clear	Inattention	Rear End	1	0	N	SH
	VT0040700/10- SH01386	Shelburne	1.42	07/07/2010	12:34	Clear	Followed too closely, No improper driving	Rear End	1	0		SH
	VT0040700/10SH0 2187	Shelburne	1.44	10/04/2010	23:37	Clear	Failure to keep in proper lane	Single Vehicle Crash	0	0	S	SH
	VT0040700/08SH0 2671	Shelburne	1.45	11/30/2008	16:17	Cloudy	Inattention, No improper driving	Rear End	1	0	S	SH
	VT0040700/11SH4 78	Shelburne	1.5	03/06/2011	21:30	Snow	Inattention, No improper driving	No Turns, Thru moves only, Broadside ^<	0	0	N	SH
	VT0040700/10SH0 2221	Shelburne	1.55	10/08/2010	16:25	Clear	Inattention, No improper driving	Rear End	2	0	N	SH

**Crash occurred prior to the last Highway Improvement Project. This data should not be used in a crash analysis. UNK indicates the Mile Marker is Unknown.*

Vertmont Agency of Transportation

General Yearly Summaries - Crash Listing: State Highways and All Federal Aid Highway Systems

From 01/01/07 To 12/31/11 General Yearly Summaries Information

*	Reporting Agency/ Number	Town	Mile Marker	Date MM/DD/YY	Time	Weather	Contributing Circumstances	Direction Of Collision	Number Of Injuries	Number Of Fatalities	Direction	Road Group
Route: US-7 Continued ...												
	VT0040700/09SH0 1618	Shelburne	1.59	08/21/2009	17:30	Rain	Made an improper turn, No improper driving	Left Turn and Thru, Angle Broadside -->v--	0	0		SH
	VT0040700/11SH0 1670	Shelburne	1.59	08/19/2011	16:15	Clear	Visibility obstructed	Same Direction Sideswipe	0	0	S	SH
	VT0040700/09SH0 0746	Shelburne	1.61	04/23/2009	10:23	Cloudy	Followed too closely, No improper driving	Rear End	0	0	N	SH
	VT0040700/11SH0 1862	Shelburne	1.61	09/15/2011	09:10	Rain	Followed too closely	Rear End	0	0	S	SH
	VT0040700/11SH0 1967	Shelburne	1.64	09/28/2011	10:02	Clear	No improper driving, Followed too closely	Rear End	0	0	N	SH
	VT0040700/10SH0 1597	Shelburne	1.65	07/31/2010	17:35	Clear	Followed too closely, Inattention, No improper driving	Rear End	1	0	S	SH
	VT0040700/11SH0 1775	Shelburne	1.65	09/02/2011	15:26	Clear	Followed too closely, No improper driving	Rear End	0	0	N	SH
	VT0040700/11SH0 2633	Shelburne	1.65	12/23/2011	14:06	Snow	No improper driving, Inattention	Other - Explain in Narrative	0	0	N	SH
	VT0040700/10-SH-02176	Shelburne	1.67	10/03/2010	17:19	Clear	Followed too closely, No improper driving	Rear End	2	0	N	SH
	VT0040700/10SH0 0954	Shelburne	1.69	05/20/2010	14:50	Clear	Distracted, No improper driving	Rear End	0	0	N	SH
	VT0040700/09SH0 0454	Shelburne	1.7	03/10/2009	14:24	Clear	Failure to keep in proper lane, Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway etc	Single Vehicle Crash	0	0	N	SH
	VT0040700/11SH1 848	Shelburne	1.7	09/12/2011	16:12	Clear	Inattention, Visibility obstructed	Single Vehicle Crash	1	0		SH
	VT0040700/11SH0 1925	Shelburne	1.7	09/23/2011	08:53	Clear	Inattention, No improper driving	Rear End	0	0	S	SH
	0413/14877-07	Shelburne	1.71	09/28/2007	15:36	Clear	Inattention, No improper driving	Rear End	0	0	N	SH
	0413/09SH01337	Shelburne	1.71	07/16/2009		Cloudy	Followed too closely, No improper driving	Rear End	0	0	S	SH
	VT0040700/10SH0 0458	Shelburne	1.71	03/10/2010	08:45	Clear	Inattention, Unknown, No improper driving	Rear End	0	0		SH
	VT0040700/10SH0 1240	Shelburne	1.74	06/21/2010	15:00	Clear	Followed too closely, Distracted, Unknown	Rear End	0	0	N	SH
	VT0040700/10SH0 1349	Shelburne	1.76	07/02/2010	12:25	Clear	Inattention, Followed too closely, No improper driving	Rear End	1	0	N	SH
	VT0040700/11SH0 1663	Shelburne	1.79	06/13/2011	08:46	Clear	Fatigued, asleep	Single Vehicle Crash	0	0	N	SH
	VT0040700/11SH0 2165	Shelburne	1.8	10/23/2011	12:25	Rain		Rear End	0	0		SH
	VT0040700/11SH0 2296	Shelburne	1.8	11/12/2011	10:14	Cloudy		Rear End	0	0	N	SH
	0413/09SH01449	Shelburne	1.82	07/30/2009	16:51	Clear	No improper driving, Failed to yield right of way	No Turns, Thru moves only, Broadside ^<	0	0	N	SH
	VT0040700/10SH0 2379	Shelburne	1.82	10/29/2010	16:01	Clear	No improper driving, Failed to yield right of way	No Turns, Thru moves only, Broadside ^<	0	0	S	SH
	0413/14546-07	Shelburne	1.83	11/05/2007	15:04	Clear	Technology Related Distraction, No improper driving	Rear End	1	0	S	SH
	VT0040700/10SH0 0373	Shelburne	1.83	02/24/2010	10:00	Snow	Followed too closely	Rear End	0	0		SH
	VT0040700/10SH0 1173	Shelburne	1.83	06/12/2010	10:27	Rain	Distracted, No improper driving	Rear End	0	0	S	SH
	VT0040700/10SH0 1250	Shelburne	1.83	06/22/2010	14:50	Clear	Failed to yield right of way, No improper driving	Rear End	0	0	N	SH
	VT0040700/11SH0 138	Shelburne	1.83	01/19/2011	14:59	Clear		Rear End	0	0	N	SH
	VT0040700/11SH0 1065	Shelburne	1.83	05/30/2011	11:44	Clear	No improper driving	Right Turn and Thru, Angle Broadside -->^--	1	0		SH
	VT0040700/11SH0 1136	Shelburne	1.83	06/16/2011	10:36	Not Reported		Other - Explain in Narrative	0	0		SH

**Crash occurred prior to the last Highway Improvement Project. This data should not be used in a crash analysis. UNK indicates the Mile Marker is Unknown.*

Vermont Agency of Transportation

Date: 06/28/2012

General Yearly Summaries - Crash Listing: State Highways and All Federal Aid Highway Systems

From 01/01/07 To 12/31/11 General Yearly Summaries Information

Route: US-7 Continued ...

*	Reporting Agency/ Number	Town	Mile Marker	Date MM/DD/YY	Time	Weather	Contributing Circumstances	Direction Of Collision	Number Of Injuries	Number Of Fatalities	Direction	Road Group
	VT0040700/09SH0067	Shelburne	1.87	01/11/2009	08:48	Not Reported	Other improper action, Failed to yield right of way	Other - Explain in Narrative	0	0	E	SH
	VT0040700/09SH01978	Shelburne	1.89	10/06/2009	08:09	Clear	Inattention, No improper driving	Rear End	0	0	N	SH
	VT0040700/09SH01082	Shelburne	1.9	06/12/2009	17:23	Clear	Followed too closely, No improper driving	Rear End	0	0	S	SH
	VT0040700/09SH02241	Shelburne	1.9	11/08/2009	13:31	Clear	Inattention, No improper driving	Rear End	0	0	N	SH
	VT0040700/10SH02172	Shelburne	1.9	10/03/2010	15:15	Clear	Distracted, No improper driving	Rear End	0	0	N	SH
	VT0040300/09SB01119	Shelburne	1.92	02/13/2009	18:34	Clear	Wrong side or wrong way, Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner, No improper driving	Opp Direction Sideswipe	0	0		SH
	VT0040700/09SH02031	Shelburne	1.92	10/12/2009	14:35	Cloudy	Inattention, Followed too closely, No improper driving	Rear End	1	0	N	SH
	VT0040700/10SH00495	Shelburne	1.93	03/17/2010	17:18	Clear	Failed to yield right of way, No improper driving	Rear End	0	0	N	SH
	VT0040700/08SH00601	Shelburne	1.95	03/21/2008	17:02	Clear	Followed too closely, Inattention, No improper driving	Rear End	1	0	N	SH
	VT0040700/10SH00425	Shelburne	1.97	03/03/2010	16:46	Clear	Inattention, Distracted, Unknown	Rear End	0	0	N	SH
	VT0040700/11SH01071	Shelburne	1.97	05/31/2011	11:20	Clear	Visibility obstructed, No improper driving	Rear End	0	0	S	SH
	VT0040700/11SH01425	Shelburne	1.97	07/17/2011	16:14	Clear	Operating defective equipment, No improper driving	Rear End	0	0	N	SH
	VT0040700/11SH01764	Shelburne	1.97	08/31/2011	14:27	Clear	Failed to yield right of way, Inattention, No improper driving	Other - Explain in Narrative	0	0	E	SH
	VT0040700/11SH02001	Shelburne	1.97	09/30/2011	16:20	Clear	Under the influence of medication/drugs/alcohol	Rear End	0	0	S	SH
	0413/13289-07	Shelburne	1.98	10/16/2007	15:31	Cloudy	Failure to keep in proper lane, Made an improper turn, No improper driving	Same Direction Sideswipe	0	0	N	SH
	0413/16600-07	Shelburne	1.98	12/20/2007	14:40	Snow	Inattention, No improper driving	Rear End	0	0	S	SH
	VT0040700/09SH100569	Shelburne	1.98	03/26/2009	21:35	Rain	Failed to yield right of way, Driving too fast for conditions	Head On	0	0	E	SH
	VT0040700/09SH00739	Shelburne	1.98	04/23/2009		Clear	No improper driving, Visibility obstructed	Rear-to-rear	0	0	N	SH
	VT0040700/10SH00390	Shelburne	1.98	02/26/2010	15:00	Clear	Other improper action, No improper driving	Rear End	0	0		SH
	VT0040700/10SH01493	Shelburne	1.98	07/14/2010	21:00	Rain	Failure to keep in proper lane, No improper driving	Rear End	0	0	S	SH
	VT0040700/10SH02304	Shelburne	1.98	10/20/2010	10:10	Cloudy	No improper driving, Disregarded traffic signs, signals, road markings	Left Turn and Thru, Angle Broadside -->v--	0	0	S	SH
	VT0040700/10SH02697	Shelburne	1.98	12/07/2010	14:30	Cloudy	Made an improper turn, No improper driving	Other - Explain in Narrative	0	0		SH
	VT0040700/11SH00740	Shelburne	1.98	04/13/2011		Cloudy	Followed too closely, No improper driving	Rear End	0	0	N	SH
	VT0040700/11SH01037	Shelburne	1.98	05/24/2011	17:10	Clear	Failure to keep in proper lane	Other - Explain in Narrative	0	0		SH
	VT0040700/04SH02119	Shelburne	1.99	10/23/2009	06:49	Clear	Followed too closely, No improper driving	Rear End	0	0	N	SH
	VT0040700/11SH01337	Shelburne	1.99	07/06/2011	14:15				0	0		SH
	0413/12220-07	Shelburne	2	09/24/2007	16:45	Clear	Operating defective equipment, No improper driving	Rear End	0	0	W	SH
	0413/17171-07	Shelburne	2	11/14/2007	18:20	Clear	Failed to yield right of way, No improper driving	No Turns, Thru moves only, Broadside ^<	0	0	E	SH
	VT0040700/09SH01304	Shelburne	2	04/14/2009	11:30	Clear	Unknown, No improper driving	Opp Direction Sideswipe	0	0	N	SH

**Crash occurred prior to the last Highway Improvement Project. This data should not be used in a crash analysis. UNK indicates the Mile Marker is Unknown.*

Vermont Agency of Transportation

General Yearly Summaries - Crash Listing: State Highways and All Federal Aid Highway Systems

From 01/01/07 To 12/31/11 General Yearly Summaries Information

Route: US-7 Continued ...

*	Reporting Agency/ Number	Town	Mile Marker	Date MM/DD/YY	Time	Weather	Contributing Circumstances	Direction Of Collision	Number Of Injuries	Number Of Fatalities	Direction	Road Group
	VT0040700/09SH0 1827	Shelburne	2	09/16/2009	22:05	Clear	No improper driving, Inattention	Rear End	0	0		SH
	VT0040700/09SH0 2289	Shelburne	2	11/14/2009	15:58	Rain	Followed too closely, No improper driving	Rear End	0	0	S	SH
	VT0040700/10SH0 1275	Shelburne	2	06/24/2010	16:54	Rain	Visibility obstructed, No improper driving	No Turns, Thru moves only, Broadside ^<	0	0	E	SH
	VT0040700/10-SH-01551	Shelburne	2	07/25/2010	18:50	Clear	Failed to yield right of way, No improper driving	No Turns, Thru moves only, Broadside ^<	1	0	E	SH
	VT0040700/10SH0 2762	Shelburne	2	12/16/2010	17:16	Rain	Other improper action, No improper driving	Rear End	0	0	S	SH
	VT0040700/11SH0 0217	Shelburne	2	01/30/2011	15:55	Cloudy	Other improper action, No improper driving	Rear End	0	0	S	SH
	VT0040700/11SH0 1612	Shelburne	2	08/12/2011	17:17	Clear	No improper driving	No Turns, Thru moves only, Broadside ^<	0	0		SH
	VT0040700/11-SH-00520	Shelburne	2.01	03/17/2011	14:05	Clear	Followed too closely, Inattention, No improper driving	Rear End	0	0	S	SH
	0414/9042-07	Shelburne	2.04	07/15/2007	13:47	Clear	Followed too closely, No improper driving	Rear End	1	0		SH
	VT0040700/10-SH-00754	Shelburne	2.07	04/24/2010	13:11	Clear	Inattention, No improper driving	Rear End	0	0	S	SH
	VT0040700/09SH0 0034	Shelburne	2.08	01/06/2009	12:15	Clear	Other improper action, No improper driving	No Turns, Thru moves only, Broadside ^<	0	0	E	SH
	VT0040700/09SH0 0094	Shelburne	2.08	01/14/2009		Clear	Failed to yield right of way, No improper driving	No Turns, Thru moves only, Broadside ^<	0	0	E	SH
	VT0040700/09SH0 0359	Shelburne	2.08	02/19/2009	18:02	Clear	Followed too closely, No improper driving	Rear End	0	0	S	SH
	VT0040700/09SH0 1342	Shelburne	2.08	07/19/2009	11:45	Not Reported	Followed too closely, No improper driving	Rear End	0	0	S	SH
	VT0040700/10SH0 0889	Shelburne	2.08	05/14/2010	08:00	Cloudy	Inattention, No improper driving	Rear End	0	0	S	SH
	VT0040700/10SH0 1903	Shelburne	2.08	09/01/2010	21:44	Clear	Inattention, No improper driving	Rear End	0	0	N	SH
	VT0040700/10SH2 369	Shelburne	2.08	10/28/2010	15:20	Cloudy	Exceeded authorized speed limit, No improper driving	Rear End	0	0	N	SH
	VT0040700/11SH0 1328	Shelburne	2.08	07/05/2011	09:05	Clear	Inattention, No improper driving	Rear End	2	0	N	SH
	VT0040700/08SH-00878	Shelburne	2.09	04/25/2008	10:14	Clear	Operating defective equipment, No improper driving	Rear End	1	0		SH
	0413/14515-07	Shelburne	2.1	11/16/2007	16:30	Cloudy	Inattention, No improper driving	Left Turn and Thru, Angle Broadside -->v--	0	0		SH
	VT0040700/09SH0 1754	Shelburne	2.11	09/08/2009	14:38	Clear	Followed too closely, Inattention, No improper driving	Rear End	0	0	N	SH
	0413/13499-07	Shelburne	2.12	07/29/2007	09:31	Unknown	Inattention, No improper driving	Rear End	0	0	S	SH
	VT0040700/10SB-4809	Shelburne	2.12	06/25/2010	15:28	Clear	Distracted, No improper driving	Same Direction Sideswipe	0	0	N	SH
	VT0040700/10SH0 2662	Shelburne	2.18	12/03/2010	18:22	Clear	No improper driving, Followed too closely	Rear End	0	0		SH
	VT0040700/11SH0 1839	Shelburne	2.27	09/11/2011	14:57	Clear	Failed to yield right of way, No improper driving	Same Direction Sideswipe	5	0	S	SH
	VT0040700/11SH0 2017	Shelburne	2.4	10/02/2011	14:55	Rain	Inattention, No improper driving	Rear End	0	0	S	SH
	0413/14879-07	Shelburne	2.44	09/25/2007	16:00	Clear	No improper driving, Other improper action	Same Direction Sideswipe	0	0		SH
	VT0040700/09SH0 0088	Shelburne	2.44	01/13/2009	07:00	Cloudy	Made an improper turn	Right Turn and Thru, Broadside ^<--	0	0		SH
	VT0040700/09SH0 1595	Shelburne	2.44	08/18/2009	08:13	Unknown	Failed to yield right of way, No improper driving	No Turns, Thru moves only, Broadside ^<	0	0		SH
	VT0040700/09SH0 1132	Shelburne	2.61	06/19/2009	15:12	Clear	Failed to yield right of way, No improper driving	No Turns, Thru moves only, Broadside ^<	0	0	E	SH
	VT0040700/09SH0 1664	Shelburne	2.62	08/28/2009	11:50	Clear	Inattention, No improper driving	Rear End	0	0	N	SH

**Crash occurred prior to the last Highway Improvement Project. This data should not be used in a crash analysis. UNK indicates the Mile Marker is Unknown.*

Vermont Agency of Transportation

General Yearly Summaries - Crash Listing: State Highways and All Federal Aid Highway Systems

From 01/01/07 To 12/31/11 General Yearly Summaries Information

*	Reporting Agency/ Number	Town	Mile Marker	Date MM/DD/YY	Time	Weather	Contributing Circumstances	Direction Of Collision	Number Of Injuries	Number Of Fatalities	Direction	Road Group
Route: US-7 Continued ...												
	VT0040700/09SH0 0997	Shelburne	2.7	06/01/2009	08:30	Unknown	Inattention, No improper driving	Rear End	0	0		SH
	VT0040700/11SH0 1732	Shelburne	2.72	08/28/2011	10:57	Rain	Driving too fast for conditions, Followed too closely, No improper driving	Rear End	0	0	N	SH
	0413/13811-07	Shelburne	2.73	10/21/2007	23:30	Clear	Disregarded traffic signs, signals, road markings	Single Vehicle Crash	1	0	S	SH
	0413/14970-07	Shelburne	2.73	11/20/2007	15:30	Cloudy	Under the influence of medication/drugs/alcohol, Driving too fast for conditions, No improper driving	Rear End	0	0		SH
								Totals:	**34**	**0**		

Total Crash Count = 123 **Fatal Crash Count = 0** **Injury Crash Count = 23** **PDO Crash Count = 100**

Note: US-7, Shelburne, MM 1.17-2.73 only.
Bostwick Rd. intersects US-7 at mile point 1.17.
Webster Rd. intersects US-7 at mile points 2.44 and 2.73.
L. Roberts Vtrans.
THIS DOCUMENT IS EXEMPT FROM DISCOVERY OR ADMISSION UNDER 23 U.S.C 409.

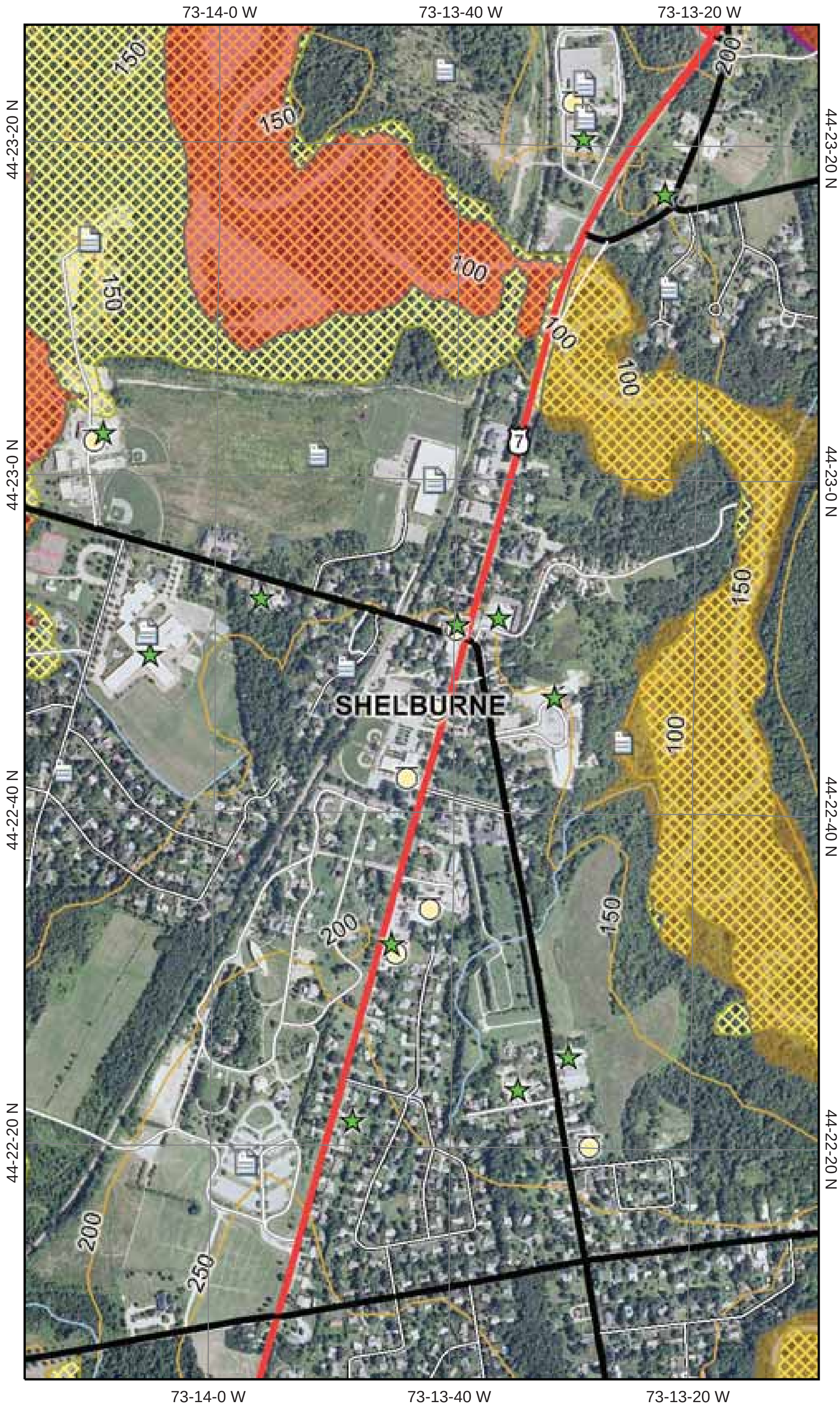
**Crash occurred prior to the last Highway Improvement Project. This data should not be used in a crash analysis. UNK indicates the Mile Marker is Unknown.*

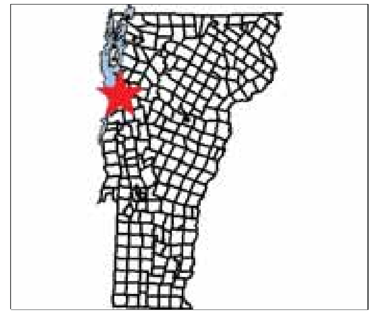
VERMONT

ANR Environmental Interest Locator

Vermont Agency of Natural Resources (ANR)

US7/Falls Rd/Harbor Rd





Legend

- Brownfields
- ACT250 PERMITS
- Hazardous Waste Site
- Underground Storage Tank

Roads
- US Highway
- Vermont State Highway
- Class One
- Class Two
- Legal Trail
- Emergency U-Turn Area
- Proposed Class Two
- Proposed Class Three
- Proposed Vermont State Highway
- Proposed US Highway
- Proposed Interstate
- Discontinued
- Interstate
- Class Three
- Class Four
- State/National Forest Highway
- Military Road (No Public Access)
- Private Road

DFIRM Floodways (Preliminary)
- FLOODWAY

Special Flood Hazard Areas (All Available Counties Effective 7.2011)
- AE (1-percent annual chance floodplains with elevations)
- A (1-percent annual chance floodplains without elevations)
- AO (1-percent annual chance zone of shallow flooding 1-3 feet)
- 0.2-percent annual chance flood hazard zone

VSWI
- Class 1 Wetland
- Class 2 Wetland
- Stormwater Impaired Watershed
- Hydrography Lakes and Ponds (VHD 5k)
- Hydrography (VHD 5k)
- VT County Boundary
- VT Town Boundaries (No Fill)
- 50 foot Contour
- NAIP Color Orthophotos 2009
- VT State Boundary (Fill)

0 700 1400 ft.

Map center: 441943, 209079

VT State Plane Meters (NAD83)

N

Scale: 1:12,020

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. VCGI and the State of Vermont make no representations of any kind, including but not limited to the warranties of merchantability or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.

URL: http://maps.vermont.gov/imf/sites/ANR_NATRESViewer/jsp/launch.jsp

7/6/12

APPENDIX B

Meeting Notes / Correspondence

Meeting Notes

Project Committee Meeting No. 1

Falls Road/Harbor Road/Route 7 Scoping Study

Shelburne, Vermont

Stantec

Date/Time:	July 10, 2012 10:00 AM
Place:	Shelburne Town Offices
Next Meeting:	August 21, 2012, 10:00AM
Attendees:	Greg Edwards, Rick Bryant - Stantec
	Bernie Gagnon, Dean Pierce, Shelburne
	Josh Schultz, VTrans
	Jason Charest, CCRPC
Distribution:	All Attendees, David DeBaie

Summary

Meeting was held to review existing roadway and traffic conditions; discuss the purpose and need statement; identify alternatives for further analysis; and, plan the first public meeting. Comments were received on the draft existing conditions report and future meeting dates were set. Stantec to prepare a draft purpose and need statement for further review. A preliminary list of alternatives was identified for further investigation.

Minutes

<u>Existing Conditions</u>

- Stantec presented a draft copy of the existing conditions chapter of the Scoping Study. Suggested edits:
  - Update the Project Committee listing
  - Fix reference to 36,000 vpd on Harbor Road.

  Committee members are invited to read the document and offer further edits.

- Dean to provide Stantec with copies of prior studies including the 2000 Shelburne Village Transportation Plan; the 2007/2008 CEA plan for Shelburne Road; and, the Built Environment Significant Views map. The May 2005 CEA conceptual site plan may only apply to an off-road site and may not be relevant.

- Bernie noted that a planned Route 7 resurfacing project will add a four-foot wide bike accommodation on each side except at the Falls Road intersection where curbing is present. A narrower shoulder will be provided here. The project also includes the addition of a fourth cross walk and pedestrian signal heads at the intersection.

- Jason noted that Shelburne has underreported crash statistics in the past. Crashes with low property damage values may have been omitted. Suggested that Stantec speak to Jim Mack in the Police Department.

- Stantec presented a project base plan. Bus stop locations will be field verified. VSE is in the process of verifying roadway rights-of-way. Draft plan shows property lines based on tax maps.

- Traffic forecasts have been developed for the year 2032 using a 0.5% per year growth rate. Jason suggested that this be checked against the nearby continuous count station. He believes that there is one on Route 7 north of the study area. Stantec should contact Maureen Carr at VTrans to obtain data and/or get her opinion on the growth rate.

- Capacity analysis results were reviewed noting that the results are more in line with observed conditions than those presented in the 2006 Smart Mobility study. (Bernie noted that long back-ups on Route 7 southbound are a regular occurrence during many hours of the day. Dean noted that since the split phase signal operations were put I place the long queues occurred more frequently.) The Smart Mobility study reported LOS B and C conditions (not congested) and the Stantec analyses are showing LOS E conditions. Part of this difference is due to the application of a Design Hour Volume adjustment in the Stantec study which was note done in the Smart Mobility study. Further field calibration (measurement of saturation flow rates) may also be considered.

- The split phasing that is now used at the intersection was first implemented during a construction project. It has been maintained for safety reasons. It seems to have reduced side street queues but caused more frequent long queues on Route 7.

- Stantec noted that the Smart Mobility study suggested that a decision on the “Loop Road” would drive the process to select a preferred alternative for Route 7 improvements. Dean noted that the Town is still very much interested in the Loop Road although plans have not been developed. It is expected to loop around the existing trailer park rather than pass through it and the Town would like to see a connection to Route 7 at Falls Road. Construction of the road would support 80 new residential units on the Harrington parcel and 100 units on the Pomerleau site. A parcel owned by Precor (next to the shopping park) might also be developed. Precor has concerns that he may lose his signage on Falls Road if the Loop Road is built and the shopping park driveway becomes a public way. Impacts to historic properties could preclude construction of the Loop Road, particularly the connection to Route 7 at Falls Road. Stantec to develop a strategy for consideration of the Loop Road in the study.

- Pedestrian crossings occur concurrent with parallel traffic flows. The pedestrian traffic crossing Route 7 currently delays right-turns from Harbor Road. Pedestrians have been hit crossing Route 7 at Church Street and at the Museum. (This was not reflected in the VTrans crash data.)

Purpose and Need

- The Purpose and Need Statement was discussed and must be developed further by Stantec. Dean noted the need to propose “contextual” solutions. Josh cited the importance of mentioning safety but was concerned that statements in support of economic activity might draw the attention of Act 250. (He would like others in VTrans to have the opportunity to review the final language.) Bernie wants to make sure that statements associated with minimizing impacts do not preclude the Town from taking parking away adjacent to the wine shop. (The existing 90-degree parking impedes traffic flow. Greg asked if parallel parking had been considered.) All seemed to agree that the purpose is to improve efficiency.

- Study may need to document existing “needs” or deficiencies.

- Stantec questioned the need to increase roadway capacity to support future development. Dean indicated that future development could include consolidation of police and fire services on the same site and expansion of the library. The existing ball fields would need to be relocated to accommodate this program.

Alternatives

- Stantec listed alternatives to be considered. These may include:
  - No Build
  - Roundabout
  - Intersection upgrades
  - Falls Road one-way southbound with upgrades to Church/Route 7
  - Right-turn only from Falls Road with upgrades to Church/Route 7

- The jughandle alternative can be eliminated from further study. Other alternatives may surface during the conduct of the study and input from the local concerns meeting.

Publicity

- Decision made to hold the Local Concerns Meeting on August 14. This will be part of the Selectmen’s meeting. Publicity will include:
  - Selectmen’s meeting agenda (town)
  - Town website (town, special page to be added)
  - Shelburne News (Stantec, due Monday before Thursday publication, two

notices preferred)

  - Mailing list (town)
  - Front Porch Forum (town)
  - Shelburne Business Association (town)
  - Bike/Pedestrian Committee (town)
  - CCTA (Stantec)
  - Addison RPC (Stantec)
  - Shelburne Farms/Shelburne Museum (town)
  - Historic Preservation Commission (Town)

- Stantec will provide a drafting public notice for review.

Future Work

- Confirm alternatives for review by end of August.
- Complete analysis by end of October.
- Next team meeting on August 21, 2012 10:00 AM. Observations from the Local Concerns Meeting will be reviewed.

Action Items

1. Town to forward prior studies to Stantec.
2. Team to conduct public outreach in advance of the Local Concerns Meeting
3. Stantec to complete the existing conditions analysis, draft the Purposed and Need Statement and prepare for the Local Concerns Meeting
4. Stantec to follow up with Shelburne Police and VTrans Traffic

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

STANTEC CONSULTING SERVICES INC.

Greg Edwards, PE
Project Manager
greg.edwards@stantec.com

Local Concerns Meeting

Falls Road/Harbor Road/Route 7 Scoping Study

Shelburne, Vermont

Date/Time:	August 14, 2012 8:00 PM
Place:	Shelburne Town Offices
Next Meeting:	unknown
Attendees:	Greg Edwards, Rick Bryant - Stantec
	Bernie Gagnon, Dean Pierce, Shelburne
	Jason Charest, CCRPC
	Board of Selectmen, Town Manager
	Approximately 25 residents
Distribution:	Project Committee, David DeBaie

Summary

Meeting was held to better define existing issues and concerns in the project area. The meeting was hosted by the Shelburne Selectboard. Stantec provided a Powerpoint presentation describing existing roadway and traffic conditions. The Board offered comments and invited the public to comment on the draft purpose and need statement. The draft purpose and need statement is provided below along with Board and resident comments.

Draft Purpose and Need Statement

Purpose: The purpose of the US 7/Falls Road/Harbor Road project is to create a safe and efficiently operating intersection to enhance mobility access and safety for all users including vehicles, transit, pedestrians, and bicycles.

Need: The performance of the intersection is considered deficient based on the regular vehicle queues and delays, limited on-road bicycle facilities, and limited opportunity for pedestrians to cross.

1. **Intersection capacity:** This signalized intersection regularly experiences queues and congestion during the AM and PM peak hours. The significant number of left turns for the US Route 7 southbound and Harbor Road approaches contribute greatly to the congestion.

2. **Bicycle facilities:** The planned VTrans resurfacing project will provide some additional 4 foot wide shoulders in the project area. This makes this important Lake Champlain Bikeway segment more bicycle friendly. The immediate area of north approach at the intersection will remain at its

existing width and one foot wide shoulders currently exist.

3. **Pedestrian facilities:** Sidewalks have been expanded over the years so t most of US 7 has a sidewalk on both sides. Sidewalks are planned for a few remaining sections. Crosswalks exist on US Route 7 at the signalized intersection and the Church Street intersection. Sidewalks are typically not separated from the roadway with curbs but often includes grassed buffer strips. The Update of the Shelburne Village Plan indicated the overall concept for US Route 7 is to create a "boulevard" character by rows of trees, curbs, and wider sidewalks better defining roadway and pedestrian zones.

4. **Traffic calming / Gateway:** This area represents the historic village core of Shelburne. To the north and south, US Route 7 transitions to a larger, more recently developed parcels and less pedestrian activity. As traffic transitions to this area with more pedestrians and school children activity, numerous drives and streets, and turning vehicles the posted speed is reduced to 35 mph. Improvements need to consider providing a design and contact that introduces motorists to the village area and promotes respect of the posted speed.

Board Comments

- Draft P&N statement is sufficiently broad and generally acceptable. Primary focus should be safety. Concern for tourists and students walking through the intersection.

- Proposed designs should "smooth" the flow on Route 7. Perhaps a roundabout will accomplish this.

- Must maintain access for the fire station and rescue squad. Maintain safe access to the schools.

- Provide adequate intersection capacity for the next fifty years. (Intersection reconstruction will not happen very often.) Ensure safety of pedestrians and bicyclists. Look at "safe routes to school" treatments. Anticipate an expansion of the retail district, particularly to the east. Consider strategies to intercept Route 7 traffic at Webster Street and Marsett Road and divert it to Spear Street.

- Enhance the aesthetic appeal of the village. (Existing utility poles and wires are ugly.)

Resident Comments

- Look at pedestrian safety. Enforce speed limits. Provide adequate parking to support village businesses and signage to direct motorists to public parking. Perhaps the ballfields could be relocated to expand public parking in the village.

- School arrival/dismissal times are most challenging from a traffic flow perspective. Consider possible new commercial space north of the Shopping Park.

- Marsett Road, Webster Street and other alternative routes as available should be considered. Traffic will only get worse as the museum looks at year-round operations and new development occurs on Route 7 south of Marsett Road. Traffic flow on Route 7 may be enhanced if a consistent cross section is provided through the entire village. Why aren't left-turn lanes used consistently along Route 7?

- Please don't send more traffic on Webster Street and Marsett Road. These are residential streets that already see too much cut-through traffic. Help Route 7 operate more smoothly. Consider the relationship between consistent design and higher speeds/capacity. Roads in Hinesburg have narrower widths but higher speed limits than in Shelburne. Perhaps narrower lanes will smooth flow.

- Route 7 northbound often queues back from the signal great distances impacting residential properties on Route 7. The situation seems to have gotten worse when the spilt phasing was installed at the Falls Road/Route 7 intersection.

- Harbor Road is generally not a problem expect during school arrival/dismissal times. Drivers have not yet adjusted to the new split phasing at the signal. Primary concern should be school traffic including pedestrians, cars and buses.

- Lighting should be improved for safe travel at night.

- Split phasing has made things worse. Signal timing is inefficient. Traffic is often stopped when there is no opposing flow.

- Truck traffic is important to the regional economy. How do we accommodate truck traffic? Should alternative truck routes be considered?

General Comments

- Paul Bohne III, the Town Manager, started the discussion. He noted that the Town has tried several strategies in the past to improve traffic conditions. Travel Demand Management was tried (addressing school schedules and arrival patterns). New sidewalks have been constructed (and one is presently under construction on Harbor Road). Alternative traffic patterns were considered in a recent study (and may be reexamined in this study). Paul stated the purpose and need as "defining the best case scenario to address today's traffic issues and handle future growth".

- The Board chairman noted that the Loop Road is still a priority for the Board and must be included in the capital plan.

- Others asked if the Loop Road would be evaluated as a one-way or two-way road and noted that some of the circulation options may overburden Falls Road.

- Residents asked that study materials be posted on the web and that comments be accepted via email.

- Residents/business owners chatting with Stantec staff after the meeting expressed support for development of a grid street system using the former train station right-of-way. A connection to the ballfields (perhaps converted to parking areas) with a signal at Church Street and Route 7 was suggested.

- Prior to the Local Concerns Meeting, the Board also heard testimony from T.J. Boyle regarding master plan alternatives for the town green and parade grounds. Pedestrian access and safety issues were discussed in this meeting. Suggestions were made that:

    - Continuous sidewalks should be provided on the east side of Route 7. (Pedestrians were observed walking on the grass just south of Falls Road after the hearing. Lighting was poor and conditions not very safe.)

    - A sidewalk should be provided on the north side of Church Street.

    - Pedestrians should be discouraged from crossing Falls Road at the Country Store due to safety considerations. Fencing may be installed to direct pedestrians to a safer crossing location.

    - A sidewalk should be provided adjacent to the Country Store connecting to the Bearded Frog plaza.

    - The midblock crosswalk on Falls Road is rarely used. (People cross at multiple locations depending upon where they park.)

    - Parallel parking is proposed on the west side of Falls Road per the Falls Road master plan.

- Prior to the town green and parade ground discussion Bernie Gagnon noted that the current sidewalk project on Harbor Road will extend to Route 7. Bernie is working with the State to rebuild the island at the corner with the gas station to incorporate the sidewalk and crosswalk on Route 7. After the meeting Bernie also reported that the utility pole in the northeast corner of the intersection will be abandoned allowing the turning radius from Falls Road to be increased.

- Prior to the meeting from approximately 5 PM to 5:45 PM Stantec observed traffic operations at the intersection. The following were noted:

    - For part of this time the southbound left-turn lane on Route 7 experienced demands that exceeded its capacity. Occasionally the queue partially blocked the through lane.

- The northbound approach had a standing queue to Church Street and beyond. Vehicles would regularly wait two cycles to clear the intersection.
- Side street queues were relatively minor. Occasionally five or six car queues were observed but two to three cars was more typical.
- The CCTA bus turning right from Falls Road crossing into the SB left-turn lane on Route 7.
- One or two pedestrians crossed either Route 7 or the side streets during each signal cycle. The Country Store was a popular destination for pedestrians.
- One southbound motorist cut through the gas station to head west on Harbor Road. Another motorist on Falls Road westbound turned right into one-way exit from the Bearded Frog.

Action Items

1. Project Committee to meet on Tuesday, August 21, 10 AM to discuss next steps.

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

STANTEC CONSULTING SERVICES INC.

Greg Edwards, PE
Project Manager
greg.edwards@stantec.com

Meeting Notes

Project Committee Meeting No. 2

Falls Road/Harbor Road/Route 7 Scoping Study

Shelburne, Vermont

Date/Time:	August 21, 2012 10:00 AM
Place:	Shelburne Town Offices
Next Meeting:	September 18, 2012, 1:00 PM
Attendees:	Greg Edwards, Rick Bryant - Stantec
	Bernie Gagnon, Dean Pierce - Shelburne
	Spencer Palmer - VTrans
	Jason Charest - CCRPC
Distribution:	All Attendees, Joshua Schultz, David DeBaie

Summary

Meeting was held to review the Local Concerns Meeting and to identify alternatives for a detailed traffic analyses. Four alternatives were identified. Results of the traffic operations analysis will be reviewed by the committee on September 18, 2012 before deciding on the next steps in the study.

Items Discussed:

- Stantec solicited comments on the existing conditions chapter of the Scoping Study. No further comments were offered at this time.

- The Town and CCRPC are to consider making the "Existing Conditions" report available for public review and comment on the web. Notice of availability will be placed on Front Porch Forum, posted in the local paper and shared via another post card mailing. Sandwich boards on Route 7 may also be used to draw attention to the study. Stantec will provide a copy for the committee's review and eventual posting.

- Bernie noted that the ongoing Route 7 work will be more extensive than as described at the Local Concerns Meeting. Curbing will be moved back to add bike lanes. A utility pole will be moved to improve a turn radius. A crosswalk will be added to Route 7.

<u>Alternatives</u>

- Alternatives to be considered from a traffic operations perspective were selected. These will include:

    - No Build

- Roundabout
- Intersection upgrades (add right-turn lanes eastbound and southbound)
- Falls Road one-way southbound with upgrades to Church/Route 7
- Right-turn only from Falls Road with upgrades to Church/Route 7

Analysis results will be reviewed before deciding which alternatives merit further evaluation.

- The jughandle alternative was discussed but given its lack of merit in the previous study and the expected challenges of public acceptance it was decided to not analyze it at this time.
- Next team meeting on September 18, 2012 1:00 PM.

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

STANTEC CONSULTING SERVICES INC.

Greg Edwards, PE
Project Manager
greg.edwards@stantec.com

Meeting Notes

Project Committee Meeting No. 3

Falls Road/Harbor Road/Route 7 Scoping Study

Shelburne, Vermont

Date/Time:	September 18, 2012 1:00 PM
Place:	Shelburne Town Offices
Next Meeting:	To be determined
Attendees:	Greg Edwards, Rick Bryant - Stantec
	Bernie Gagnon, Dean Pierce, Paul Bohne – Town of Shelburne
	Spencer Palmer - VTrans
	Jason Charest - CCRPC
Distribution:	All Attendees, Joshua Schultz, David DeBaie

Summary

Meeting was held to review traffic operations analyses for identified alternatives. Paul Bohne suggested that the study take a detour and consider the proposed Loop Road now. Jason Charest to determine if the CCRPC can fund this effort under the Technical Assistance Program.

Discussion Items:

Loop Road

- Paul noted that political support for the Loop Road is solidifying. The Harrington Village project is under review and will likely get approved. This project will build the northern end of the Loop Road connecting to Route 7. Pomerleau is ready to construct the middle section to support work at the trailer park. The shopping center has agreed to accommodate the southern section. Pomerleau would like the Town to commit to the Loop Road now as this decision would impact plans for their seven-acre site along the Loop Road.

- Paul would like to have the March 2013 Town Meeting approve a bond for funding to construct the sections of the Loop Road that are not being built by others. In order to meet this deadline, the project cost should be defined by the end of January. This will allow time to draft the language for the warrant article and hold public hearings.

- The Town was considering the use of a municipal planning grant to fund the Loop Road study. Jason suggested that the Technical Assistance Program of the RPC could apply. Jason to investigate with others in his office.

- Jason suggested that the Scoping Study be suspended until the Loop Road study is completed. Greg suggested that the Loop Road study also include a “grid streets" analysis including both sides of Route 7. A concern was raised that the RPC funded study would be at a planning level (examining operational benefits) and would not provide the detailed construction cost estimate that the Town requires. A separate study may be needed to develop the cost estimate.

- Paul explained that the Town would construct the roadway from the southern limit of the Pomerleau property to and through the shopping park. The Town would also construct the link to Route 7 just north of the existing Falls Road intersection, if feasible. Falls Road may need to become one-way southbound to accommodate this link.

<u>Scoping Study</u>

- Bernie and Jim Clancy at VTrans can provide Stantec with contacts for all of the utilities in the highway right-of-way.

- The draft Existing Conditions report is now on the Town website. Its availability will be noticed in the local paper and on the Front Porch Forum. Stantec would be interested in receiving copies of any public comments made. None have been received to date.

- Stantec provided a handout and reviewed the operations analysis results. Analyses were limited to the US 7/Falls Road/Harbor Road intersection. Impacts at Church Street will be considered later.

    - The roundabout would operate over capacity in 2032 based on the HCS analysis procedures. Evaluation with other tools is possible however operations are likely to be marginal at best.

    - Intersection upgrades offer some benefits with levels of service improving from F to E, no build to build.

    - Intersection upgrades with changes to Falls Road (one-way or turn restrictions) offer more significant benefits with LOS B or C conditions.

- Land impacts will be most substantial for the roundabout alternative. Turn lane additions appear to be more feasible. With a 100 foot right-of-way along Route 7, right-of-way is not a constraint for the turn lane additions. However, significant encroachment has occurred within the right-of-way such that land/building impacts would be significant is some areas if the roadway were built out to the right-of-way limits.

- Converting Falls Road to one-way operation will allow the Town to incorporate other improvements along the roadway defined in the Town masterplan.

- Stantec noted that designing for a WB-67 vehicle will require very large turning radii with potential for ROW acquisition and historic resource impacts. Stop bars may be set back to accommodate trucks as well. Some flexibility in the design may be desirable to reduce the scale of the intersection and better accommodate pedestrians and bikes. A design exception may be required.

- A two-way, left-turn lane throughout the corridor is possible under all design alternatives.

Action Items:

CCRPC

- Investigate Technical Assistance Program funding availability

Stantec- **These action items are on hold pending further discussion on the Loop road**

- Provide survey base mapping to utility companies for review and input on their existing facilities.
- Revisit the roundabout analysis. Consider alternative models.
- Develop more detailed concept plans for proposed alternatives.
- Evaluate traffic impacts at Church Street/US 7 and Church St and Falls Rd
- Set next team meeting.

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

STANTEC CONSULTING SERVICES INC.

Greg Edwards, PE
Project Manager
greg.edwards@stantec.com

Meeting Notes

Project Committee Meeting No. 4

Falls Road/Harbor Road/Route 7 Scoping Study

Shelburne, Vermont

Date/Time:	February 14, 2012 10:00 AM
Place:	Shelburne Town Offices
Next Meeting:	To be determined
Attendees:	Greg Edwards, Rick Bryant – Stantec
	Dean Pierce, Paul Bohne – Town of Shelburne
	Spencer Palmer - VTrans
	Jason Charest - CCRPC
Distribution:	All Attendees, Joshua Schultz, David DeBaie

Summary

This meeting was to review the results for the loop road analysis and confirm the assumptions and alternatives to move forward in the scoping process.

Discussion Items:

Loop Road

- The loop road continues to be developed. This includes an economic analysis and a further public process. The goal is to have the select board make a decision on pursuing its funding by September.

- For this project additional alternatives that include a loop road connection to US 7 will be analyzed. It will assumed the already analyzed alternatives will suffice to describe the US 7/Harbor Rd intersection traffic operation without a connection to US 7 since the loop road itself (i.e. without a connection to US7) changes the traffic volumes very little at the intersection.

Scoping Study

- Traffic Demand Management, relative to the school operations, will be mentioned. The town has already worked with the school and the Safe Routes to School program and have seen more children walking and bicycling to school

- The crash history for this area suggests safety due to vehicle speed is not an issue. By observation during congested times the traffic moves through the intersection very slowly. The numerous adjacent accesses, adjacent parking, the difficulty of turning vehicles, and slowly starting trucks add to the inefficiency of the intersection. The resulting congestion creates safety concerns by delaying drivers and hence they may operate less safely.

- Stantec will determine the traffic reduction benefit to the intersection by adding a US 7 connection north and south from Harbor Road. The results will be distributed and discussed at the next meeting.

- The following alternatives will be analyzed and discussed at the next meeting:

  - Option A – Additional Turn Lanes, without loop road/US 7 connection

  - Option B – Falls Road One Way Eastbound, with and without loop road connection to US 7

  - Option C – Westbound right only, with and without loop road connection

  - Option D – Roundabout

- It was determined to minimize the effort and number of alternatives the intersection analysis already completed without the loop road would be sufficient since the loop road construction without a US 7 connection would have little consequence on the intersection operation.

- It was discussed that the one lane roundabout alternative does not warrant additional analysis or evaluation at this time. This is primarily due to its limited improvement on traffic operations and the impacts on adjacent historic resources. The traffic analysis suggests a two lane roundabout would be needed.

- For the public process the town is pursuing establishing a steering committee that would include community members and provide input on the development of this project as well as the proposed loop road and village studies.

- The draft Existing Conditions report is posted on the town's website at http://www.shelburnevt.org/html/ExistingConditions.pdf and will be posted or linked on the CCPRC's website.

- Project schedule; The town's desire is to complete the scoping and determine a preferred alternative by August.

- Next meeting: March 7, 2013 at 10 am at the Town offices.

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

STANTEC CONSULTING SERVICES INC.

Greg Edwards, PE
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Meeting Notes

Stakeholders Meeting

Shelburne US7/Harbor Rd/Falls Rd Scoping / 195310774

Stantec

Date/Time:	April 11, 2013 / 4:00 PM
Place:	Shelburne Town Offices
Next Meeting:	TBD
Attendees:	See Attendance List
Absentees:	None
Distribution:	Dean Pierce, Paul Bohne, Spencer Palmer, Rick Bryant

Item:

1. **Meeting Introduction:** Dean Pierce introduced the project, steering committee and brief background.
2. **Project Presentation:** Rick Bryant reviewed the existing conditions, project purpose and need and the project alternatives.
3. **Public Comments/Questions:**
    - **a.** It was pointed out the existing signal operation may be improved with a left turn arrow for the Harbor Road approach since it is not clear to Harbor Road traffic that they do not need to yield to Falls Road traffic. This is a planned improvement by VTrans.
    - **b.** Also pointed out that the “No Right Turn” arrow for the Falls Road approach creates a long all red phase and delays traffic.
    - **c.** Suggested that the Harbor Road approach have an exclusive right turn lane and the throughs and lefts be combined. Due to the large number of left turns, the lanes are more balanced and would operate more efficiently with a thru/right turn lane and an exclusive left turn lane.
    - **d.** Many expressed concern with the One-way Falls Road alternative indicating it would be confusing, requires traffic to make more turns, not as pedestrian friendly due to higher speeds, and may be harmful to existing businesses on Falls Road.
    - **e.** The effects of the Loop Road were questioned and it was indicated the Loop Road did not serve as a by-pass for through traffic and more served the traffic associated with the potential development created by the new access. Minus a direct connection to the US7 intersection, the Loop Road traffic has little effect on the intersection’s operation.
    - **f.** It was suggested grids streets, west of the intersection, be pursued in lieu of intersection improvements. These streets would provide an alternative to the Harbor Road traffic but have many challenges and impacts making it difficult and very time consuming to construct. It was indicated grid streets may be a longer term goal of the town to pursue.

g. A participant suggested considering a phased approach to the construction such as constructing just one of the additional turn lanes on the approaches before doing additional ones.

h. It was indicated the traffic congestion is for a very short duration and is primarily when school opens or closes. The need to do improvements for this was questioned. It was suggested the Harbor Road approach be provided less green time so as the US 7 congestion could be relieved and it would provide an incentive for parents to not bring their children to school. Concerns when doing this include the deteriorating safety associated with delayed traffic.

i. Adaptive Signal Control was identified as another option to consider as it may address some of the inefficiencies associated with the existing signal operations.

j. The conduct of new traffic counts was suggested as traffic operations seem to have improved since VTrans made certain improvements to the intersection. Stantec noted that some of the perceived improvement in operations may simply be due to seasonal variations in traffic volumes. Volumes and congestion are likely to pick up in the summer months.

4. **Next steps**: The steering committee will review comments, incorporate any determined changes or additional information, refine an evaluation of alternatives and present to stakeholders and/or selectboard for comment and eventual endorsement.

The meeting adjourned at 6:00 PM
The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

Stantec Consulting Services Inc.

Gregory A. Edwards, PE
Principal
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Meeting Notes

Stakeholders Meeting

Shelburne US7/Harbor Rd/Falls Rd Scoping / 195310774

Date/Time:	May 13, 2013 / 6:00 PM
Place:	Shelburne Town Offices
Next Meeting:	TBD
Attendees:	See Attendance List
Absentees:	None
Distribution:	Dean Pierce, Paul Bohne, Spencer Palmer, Rick Bryant, Greg Edwards, Joshua Schultz, Derek Lyman, Jason Charest

Item:

1. **Meeting Introduction:** Dean Pierce introduced the project, steering committee and brief background.
2. **Project Presentation:** Greg Edwards reviewed the study process, existing conditions, project purpose and need and the project alternatives as presented in the prior stakeholders meeting. New information was presented showing hourly volumes at the intersection over a twelve-hour period and cross sections for Route 7. Alternative plans were also shown indicating how ROW and landscaping impacts on Harbor Road can be minimized. Likewise, drawings were presented showing how on-street parking can be expanded along Falls Road with the one-way concept. A new plan was presented showing that parking impacts on Church Street can be reduced if a signal is installed at Route 7. (Under Strategy 2 the proposed Church Street dedicated right turn lane can be eliminated preserving more parking adjacent to the park.)
3. **Public Comments/Questions:**
   - **a.** Suggested that the Harbor Road approach have an exclusive right turn lane and the throughs and lefts be combined. Volume data were presented showing that due to the large number of left turns, the lanes are more balanced and would operate more efficiently with a thru/right turn lane and an exclusive left turn lane as proposed.
   - **b.** Concerns were again expressed that the one-way Falls Road alternative would be confusing, (particularly for visitors), not as pedestrian friendly due to higher speeds and may be harmful to existing businesses on Falls Road. Stantec noted that a connection to the proposed Loop Road might help mitigate these impacts and a one way falls Road requires a narrower roadway providing more opportunity for pedestrian, bicycle and traffic calming facilities.
   - **c.** Continued interest in grids streets was expressed with some residents indicating that they presently cut-through the town office complex. (Informally, part of a grid street system exists.) Stantec noted that a grid street system may have positive impacts on traffic operations and

remains open for consideration as a long-range alternative. The scoping study however, is more focused on near-term alternatives.

d. Participants again suggested considering a phased approach to the construction such as constructing just the primary intersection improvements and delaying any actions relating to Church Street and operations along Falls Road. Some suggested an economic impact study should be conducted before changes are made to Falls Road.

e. Concerns were expressed regarding the uncertainty of the future traffic forecasts and consequently the need for capacity improvements. VTrans noted that the need exists today as the intersection presently operates at capacity. Recognizing that it may take as many as five years to implement the plan, VTrans urged the Town to move forward with the scoping process.

f. It was again suggested that traffic congestion occurs for a very short duration and that the need to do improvements is limited. Stantec provided a graph of hourly traffic volumes throughout the day and explained that traffic volumes are at high levels for four to five hours per day.

g. A suggestion was made that no action is needed as congestion will cause traffic to divert to alternative routes. For example, it was posited that there is no need to make Falls Road one-way as traffic will divert to Church Street if delays are too long to enter Route 7 from Falls Road. Others countered that the added delays would greatly increase response times for emergency vehicles and create greater vehicle emissions in the village.

h. Adaptive Traffic Control was again identified as another option to consider as it may address some of the inefficiencies associated with the existing signal operations. Stantec reported that preliminary findings for the VT 2A/Susie Wilson Road intersection show that the ATC installation increased peak hour capacity.

i. The need to update the traffic counts was questioned. Again it was reported that counts were done in June 2012 while schools were in session and the demand likely has not changed.

j. It was noted that some traffic may be diverted from the intersection if it were easier to make a left-turn from the school driveway on Harbor Road. School traffic headed north would then turn left onto Harbor Road and right on Bay Road to reach Route 7 North. (Off-line a parent of a student at the Waldorf School indicated that she uses this route to return north after dropping students at the school. However, the Waldorf School is on the north side of Harbor Road allowing for a right-turn exit to Harbor Road.) Installation of signal at the school driveway was suggested as after school activities create an extended “peak hour”. The CCRPC suggested that use of a police detail at this location may be more appropriate.

k. Suggestion was made that the speed limit be lowered on Route 7 to reduce the frequency of red light running. Others speculated that slower speeds and longer delays might actually encourage more red light running.

l. Any loss of parking in the village center was cited as a concern as it could negatively impact struggling businesses.

m. Historic Commission representative expressed concern regarding the impacts of any Route 7 widening. She also noted that the existing drainage ditches abutting the road would be impacted. Stantec presented cross section plans illustrating how the use of curbing and a closed drainage system would eliminate the ditches. Stantec also noted that drainage will be addressed in the final design of improvement plans. Impacts, in terms on new impervious surface, are less than one acre for all alternatives which lessens the stormwater permit requirements.

n. The construction of a new interchange on I-89 at Route 116 was seen as a possible strategy to mitigate impacts of through traffic on Route 7. Opposition to widening Route 7 to provide two through lanes in each direction was noted. It was indicated there is no active planning being done on this interchange and a two through lane alternative was discarded.

o. Concern expressed that widening the intersection approaches would increase pedestrian crossing times and in turn affect intersection efficiency. Stantec noted that the walk times were considered in the intersection operations analyses.

p. Suggestion was made that the future traffic forecasts should be based on projected population changes as noted in the ECOS study.

q. Trade-offs between preserving the historic village character and accommodating all modes of travel with bike lanes and sidewalks were noted. It was indicated sidewalks and bike lanes provide better access to local businesses.

r. Under Strategy 2 (One-way Falls Road) improvements will also be needed at the Church Street/Falls Road intersection to allow trucks leaving the Shopping Park to head north. Required widenings at this location could affect parking spaces and park land. Similarly, the one-way operation would have an impact on school and CCTA bus routes.

s. The median treatment on Route 7 just south of Church Street should consider the need to access a business on the west side of Route 7. As shown, the proposed median extends south to but does not block the driveway.

t. The Parking impacts on Harbor Road were questioned. Approximately seven 90-degree spaces will be replaced by six parallel spaces. It should be noted the parallel parking also provides an opportunity to utilize an approximately 15 foot wide space between the brick building and the parallel parking.

u. Details of the projected traffic operations for Strategy 1 showed that of the three lane additions proposed, the addition of a southbound right-turn lane on Route 7 offered the least benefit. This led some to suggest that the southbound right-turn lane be dropped from consideration allowing Route 7 to remain only three lanes wide. The narrower road better accommodates pedestrians and helps preserve the village character.

v. Access to the Shelburne Inn/Bearded Frog was cited as an existing problem. It was suggested access to Route 7 be restricted to a new access on the north side of the building. Currently details of possible access management improvements have not been part of this study. This access has been previously approved with property's redevelopment and will be difficult to change as part of this project.

4. **Next steps**: The project committee will review comments, discuss and evaluate possible "hybrid" alternatives. Stantec will complete the draft report and make if available for review by the public and selectboard in advance of a hearing seeking selectboard endorsement. The project committee will discuss the value and need to conduct a third stakeholder meeting.

The meeting adjourned at 8:30 PM
The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

Stantec Consulting Services Inc.

Gregory A. Edwards, PE
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Meeting Notes

Stakeholders Meeting No 3

Shelburne US7/Harbor Rd/Falls Rd Scoping / 195310774

Date/Time:	June 18, 2013 / 7:00 PM
Place:	Shelburne Town Offices
Next Meeting:	TBD
Attendees:	See Attendance List
Absentees:	None
Distribution:	Dean Pierce, Paul Bohne, Spencer Palmer, Rick Bryant, Greg Edwards, Joshua Schultz, Derek Lyman, Jason Charest

Item:

1. **Meeting Introduction:** Dean Pierce introduced the project and the steering committee.
2. **Project Presentation:** Greg Edwards reviewed the study process, existing conditions, project purpose and need and the project alternatives as presented in the prior stakeholders meeting. New information was presented relative to:
    - **a.** Components of a "complete street". Reference was made to state law requiring consideration of complete street elements on all roadway projects.
    - **b.** Strategy #4 is comparable to Strategy #1 (Intersection Improvements Only) except that it does not include a southbound right-turn lane on Route 7 and a narrower cross section is proposed for Harbor Road. Bike lanes are not shown on Harbor Road under Strategy #4.
3. **Public Comments/Questions:**
    - **a.** It was suggested to consider providing a shared-use path on at least one side of Route 7 and eliminate the on-street bike lane/shoulder to provide a narrower cross section. On-street bike lanes would not be used by children destined to the schools. Stantec noted that the purpose of the on-street bike lanes/shoulder is to accommodate experienced on road bicyclists and that a shared use path would unlikely be used by them.
    - **b.** It was questioned how the town could pursue the alternative concept of narrower shoulder and a shared use path. The response to this included that, if the Town elected, it could seek VTrans approval of a narrower shoulder but since it does not meet standards and it is less likely to be approved.
    - **c.** It was pointed out, the proposed new trees in the Route 7 right-of-way may serve as traffic calming features and slower off-peak travel speeds are preferred.
    - **d.** Concern was expressed regarding the bike lane treatment on Route 7

southbound with the proposed southbound right-turn lane from a safety perspective. (The bike lane is located between the through travel lane and the left-turn lane.) Jason explained that the proposed design is the preferred design based on national experience.

e. A request was made that any reference to the Loop Road and/or Loop Road Connector be removed from all plans illustrating Strategies #1 through #4 and noted the removal of the notes will make it clear that the Route 7 Scoping Study is not advocating for or against the Loop Road project.

f. Prior objections to Strategy #2, One-way Falls Road, were restated. These relate to: challenges accommodating trucks destined to the Shopping Park; loss of on-street parking; and, confusing traffic pattern for visitors to local businesses. Suggestion made that Strategy #2 is eliminated for consideration at the present time noting that implementation of Strategies #1 or #4 would not preclude implementation of Strategy #2 at a later point in time.

g. It was asked if the magnitude of the benefits associated with extending the left-turn lanes on Route 7 had been calculated. Stantec has not done this calculation.

h. Cross sections on Route 7 were displayed a second time to illustrate how proposed roadway widenings would impact existing drainage ditches on the side of the road. A closed drainage system would replace the ditches.

i. A suggestion was made that the Volume-to-Capacity Ratio comparison slide be updated for future presentations to have the vertical scale begin at zero and not 0.7. Using the 0.7 starting point visually overemphasizes the impacts of the various improvement strategies.

j. Kevin Clayton met with VTrans Historic Preservation Officer, Scott Newman, on the site and indicated that Scott said the removal of trees along Harbor Road to expand the proposed parallel parking may be a problem. Kevin suggested that angled parking be considered as an alternative. Others noted that angled or parallel parking spaces may get more use as they would be easier to access in traffic. Kevin noted that the extended left-turn lanes on Route 7 should benefit access to his property (the coffee shop in the southwest corner of the intersection).

k. Concerns were expressed that the worsening traffic congestion will have a long-term negative impact on businesses in the village. Potential customers will avoid the village because of the congestion. (Some already are.) Eliminating the Route 7 bike lanes was suggested if it would help improve vehicular traffic flow and/or make it easier to implement improvements that do help vehicular flow.

l. Issues regarding the existing signage and signal display on Harbor Road were repeated. Motorists are unaware of the split phasing condition and that left-turns from Harbor Road are protect. Left-turn motorists therefore hesitate before entering the intersection reducing flow rates. Suggestion was made that the split-phasing could be eliminated however; others noted that this seemed to improve traffic flow when it was first introduced. VTrans is reportedly looking into possible changes independent of the outcome of this Scoping Study.

- **m.** A member of the Town Planning Commission noted one of the Commission's goals is to promote walking and outdoor dining in the village. She asked the Steering Committee to be very cautious about adding more pavement in the village to create an auto-oriented environment like Taft Corners. She would prefer to see the Town pursue a "grid streets" strategy and asked if the study should have been conducted with greater involvement from the Planning Commission.
- **n.** A suggestion was again made that a new interchange on I-89, Exit 12B, might draw traffic away from Route 7 lessening the need to make changes in the village. Jason noted that the 12B project is not presently active and that Shelburne should not rely on that project to solve traffic problems in the village.
- **o.** A suggestion was made the bus pull outs might help to improve traffic flow. Likewise, certain bus stops could be relocated to improve flow. Stantec noted that the Town Manager is already exploring this issue with the CCTA.
- **p.** The purpose of the study was again questioned. It was mentioned severe traffic delays seem to be limited to Route 7, Falls Road rarely sees long delay, and delays are longer on Harbor Road than on Falls Road but are not unbearable. It was suggested these could also be reduced by addressing existing school access issues. It was indicated the town and school are discussing strategies to increase bus usage by students which would mean fewer parents driving to the school. It was started that it seems that the study's main purpose is to reduce delays for motorists on Route 7 rather than for Shelburne residents.
- **q.** It was questioned and noted that the Town could take ownership of this section of Route 7 allowing the Town greater control over the future design and signal operations. VTrans indicated that the Town would see its roadway maintenance costs increase dramatically should it take ownership of the road.
- **r.** It was suggested that the Evaluation Matrix include, as a positive, the number of trees planted in the village under each strategy.
- **s.** Suggested that the Selectboard hearing on the project be held in the fall rather than during the summer when meeting attendance may be light.

4. **Closing**: Dean invited residents to offer further comments on the alternative strategies via the project weblog linked to the Town's website. The meeting adjourned at 9:00 PM
5. **Next steps**: The project committee will: review comments, discuss possible direct involvement with the Planning Commission; and, prepare for the Selectboard meeting. Selectboard meeting date to be determined.

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

Stantec Consulting Services Inc.

Gregory A. Edwards, PE
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Meeting Notes

Committee Meeting No 4 -1

Shelburne US7/Harbor Rd/Falls Rd Scoping / 195310774

Date/Time:	July 9, 2013 / 1:00 PM
Place:	Shelburne Town Offices
Next Meeting:	TBD
Attendees:	Dean Pierce, Paul Bohne, Derek Lyman, Jason Charest, John Zicconi, Greg Edwards, Rick Bryant, Scott Newman (via telephone)
Absentees:	None
Distribution:	Attendees plus, Spencer Palmer, Joshua Schultz, David DeBaie

Item:

1. **Meeting Agenda:** Purpose of meeting was to review comments received at the June 18, 2013 Stakeholders Meeting and to receive comments from Scott Newman regarding historic district issues.
2. **Historic Preservation:** Scott Newman learned of the project through Kevin Clayton and met with Kevin on site prior to the June 18, 2013 Stakeholders Meeting. The concern raised by Kevin relates to the proposed provision of replacement parking on Harbor Road. Parallel parking spaces have been proposed along the south side of the roadway which would impact the existing greenbelt, some newer trees and one very mature tree. Scott explained that these impacts would constitute an "adverse impact" and subject the project to a Section 4F review process. Within this process proponents must consider all reasonable alternatives including the No Build alternative. Interests with respect to preservation of the historic district and traffic operations/safety must be balanced. Scott recognized that reorientation of the parking along Harbor Road (from 90-degree parking to parallel parking) offers a safety benefit. Another consideration is the importance of the on-street parking in maintaining the economic viability of the historic district. (If businesses in the district were to fail due to a lack of adequate parking then the historic buildings that house these businesses may fall into a state of disrepair.) It was agreed that an on-site meeting should be scheduled with Scott and the project Committee. This has been set for 8 AM, July 24. Other issues discussed with Scott include:
   - **a.** Warrants for the proposed left-turn lane on Harbor Road. How "strong" is the warrant?
   - **b.** Operation of the left-turn arrow on Harbor Road. Scott would prefer to visit the site with the arrow operating. (Paul and Derek to check on the status of this. VTrans was to repair it soon.)
   - **c.** Impacts of split phasing. (Intended to provide safer and more efficient operation with no reduction in overall capacity.)
   - **d.** John emphasized the importance of considering alternatives based on his experience with similar projects. Shortening the proposed left-turn

lane would lessen green belt impacts.

e. The other study underway in the village may look at other strategies to increase the parking supply.

f. During the site visit Scott should also be asked about potential impacts to the green belts along Route 7 associated with proposed turn lane extensions.

g. Should discuss with Scott the implications of impacts within and outside the roadway right-of-way. If the ROW is available for transportation purposes why would not tree and greenbelt removal be allowed if it is to support transportation?

3. Stakeholder Meeting Minutes:

Minutes from the June 18, 2013 stakeholder meeting were reviewed item by item to determine possible future actions. The minutes are repeated below followed by committee discussion points and/or agreed upon action items in italics.

a. It was suggested that a shared-use path on at least one side of Route 7 be considered. The on-street bike lane/shoulder could be eliminated to provide a narrower cross section. On-street bike lanes would not be used by children destined to the schools. Stantec noted that the purpose of the on-street bike lanes/shoulder is to accommodate experienced on road bicyclists and that a shared use path would unlikely be used by them. *Dean noted that this is a dead issue. The Town considered a shared-use path in prior studies and rejected the idea. Six feet wide sidewalks could be considered to better accommodate pedestrians and children on bicycles. Derek noted that Route 7 must be at least 32 feet wide for plowing purposes. Maintaining on-street bike lanes would be consistent with the State's completed streets policy.*

b. It was questioned how the town could pursue the alternative concept of narrower shoulder and a shared use path. The response to this included that, if the Town elected, it could seek VTrans approval of a narrower shoulder but since it does not meet standards and it is less likely to be approved. *See above.*

c. It was pointed out, the proposed new trees in the Route 7 right-of-way may serve as traffic calming features and slower off-peak travel speeds are preferred. *VTrans may resist the installation of more street trees along Route 7. VTrans' Amenity Policy should be consulted. The Town likes the aesthetic and traffic calming aspects that street trees provide. VTrans may have concerns regarding cost, maintenance and safety.*

d. Concern was expressed regarding the bike lane treatment on Route 7 southbound with the proposed southbound right-turn lane from a safety perspective. (The bike lane is located between the through travel lane and the left-turn lane.) Jason explained that the proposed design is the preferred design based on national experience. *Southbound right-turn* *lane may not be part of the preferred plan.*

e. A request was made that any reference to the Loop Road and/or Loop Road Connector be removed from all plans illustrating Strategies #1 through #4 and noted the removal of the notes will make it clear that the Route 7 Scoping Study is not advocating for or against the Loop Road project. *Linework showing the possible Loop Road Connector will be removed from the concept plans. A note may be added to each plan or to the evaluation matrix commenting on the compatibility of each plan with the Loop Road.*

f. Prior objections to Strategy #2, One-way Falls Road, were restated. These relate to: challenges accommodating trucks destined to the Shopping Park; loss of on-street parking; and, confusing traffic pattern for visitors to local businesses. Suggestion made that Strategy #2 is eliminated for consideration at the present time noting that implementation of Strategies #1 or #4 would not preclude implementation of Strategy #2 at a later point in time.

g. It was asked if the magnitude of the benefits associated with extending the left-turn lanes on Route 7 had been calculated. Stantec has not done this calculation. *Stantec to perform calculations. May look at "percentage of blocked time" and other SYNCHO outputs. Effect on overall capacity and level of service may be considered by adjusting saturation flow rates.*

h. Cross sections on Route 7 were displayed a second time to illustrate how proposed roadway widenings would impact existing drainage ditches on the side of the road. A closed drainage system would replace the ditches. *Dean noted that construction plans for Harrington Village are available and will send PDF to Stantec. Drawings were prepared by Civil Engineering Associates (Dave Marshall-PM).*

i. A suggestion was made that the Volume-to-Capacity Ratio comparison slide be updated for future presentations to have the vertical scale begin at zero and not 0.7. Using the 0.7 starting point visually overemphasizes the impacts of the various improvement strategies. *Stantec to modify slide as suggested.*

j. Kevin Clayton met with VTrans Historic Preservation Officer, Scott Newman, on the site and indicated that Scott said the removal of trees along Harbor Road to expand the proposed parallel parking may be a problem. Kevin suggested that angled parking be considered as an alternative. Others noted that angled or parallel parking spaces may get more use as they would be easier to access in traffic. Kevin noted that the extended left-turn lanes on Route 7 should benefit access to his property (the coffee shop in the southwest corner of the intersection). *VTrans would prefer to dismiss angled parking as unsafe. Will only evaluate this option if pressed by Scott Newman.*

k. Concerns were expressed that the worsening traffic congestion will have a long-term negative impact on businesses in the village. Potential customers will avoid the village because of the congestion. (Some already are.) Eliminating the Route 7 bike lanes was suggested if it would help improve vehicular traffic flow and/or make it easier to implement improvements that do help vehicular flow. *Committee does not believe that bike lanes worsen vehicular traffic flow. Stantec will check for documentation in the Highway Capacity Manual to demonstrate this point. May also reference VTrans Complete Streets design standards. Will look for allowances for narrower lanes in historic districts. Federal Highway standards are available for lane widths as well.*

l. Issues regarding the existing signage and signal display on Harbor Road were repeated. Motorists are unaware of the split phasing condition and that left-turns from Harbor Road are protect. Left-turn motorists therefore hesitate before entering the intersection reducing flow rates. Suggestion was made that the split-phasing could be eliminated however; others noted that this seemed to improve traffic flow when it was first introduced. VTrans is reportedly looking into possible changes independent of the outcome of this Scoping Study.

m. A member of the Town Planning Commission noted one of the Commission's goals is to promote walking and outdoor dining in the village. She asked the Steering Committee to be very cautious about adding more pavement in the village to create an auto-oriented environment like Taft Corners. She would prefer to see the Town pursue a "grid streets" strategy and asked if the study should have been conducted with greater involvement from the Planning Commission. *Paul or Dean will set a date to meet with the Planning Commission after the Scott Newman meeting. August 8 or August 22 are likely candidates.*

n. A suggestion was again made that a new interchange on I-89, Exit 12B, might draw traffic away from Route 7 lessening the need to make changes in the village. Jason noted that the 12B project is not presently active and that Shelburne should not rely on that project to solve traffic problems in the village. *Committee agreed that this is a non-issue for the study at hand.*

o. A suggestion was made the bus pull outs might help to improve traffic flow. Likewise, certain bus stops could be relocated to improve flow. Stantec noted that the Town Manager is already exploring this issue with the CCTA. *Paul will follow up with the CCTA on this and also inquire as to why buses are stopping at the Mobil station when there is no designated stop there.*

p. The purpose of the study was again questioned. It was mentioned severe traffic delays seem to be limited to Route 7, Falls Road rarely sees long delay, and delays are longer on Harbor Road than on Falls Road but are not unbearable. It was suggested these could also be reduced by addressing existing school access issues. It was indicated the town and school are discussing strategies to increase bus usage by students which would mean fewer parents driving to the school. It was started that it seems that the study's main purpose is to reduce delays for motorists on Route 7 rather than for Shelburne residents.

q. It was questioned and noted that the Town could take ownership of this section of Route 7 allowing the Town greater control over the future design and signal operations. VTrans indicated that the Town would see its roadway maintenance costs increase dramatically should it take ownership of the road.

r. It was suggested that the Evaluation Matrix include, as a positive, the number of trees planted in the village under each strategy.

s. Suggested that the Selectboard hearing on the project be held in the fall rather than during the summer when meeting attendance may be light.

4. **Next steps**: The project committee will meet with Scott Newman, the Planning Commission and the Selectboard in this order. Stantec will update the presentation slides and evaluation matrix bases on the above>

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

Stantec Consulting Services Inc.

Gregory A. Edwards, PE
Principal
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Meeting Notes

Committee Meeting No 5

Shelburne US7/Harbor Rd/Falls Rd Scoping / 195310774

Date/Time:	July 24, 2013 / 8:00 AM
Place:	Project Site
Next Meeting:	TBD
Attendees:	Dean Pierce, Paul Bohne, Derek Lyman, Jason Charest, John Zicconi, Greg Edwards, Rick Bryant, Scott Newman, Caitlin ___ telephone)
Absentees:	None
Distribution:	Attendees plus, Spencer Palmer, Joshua Schultz, David DeBaie

Item:

1. **Meeting Agenda:** Purpose of meeting was to review potential historic district issues with Scott Newman. Primary concern relates to the potential widening of Harbor Road. Additional concerns relate to work within the Route 7 layout and a recently revived roundabout alternative.
2. **Route 7:** Stantec described various improvements within the Route 7 right-of-way that would impact existing green space. Minor widenings to extend the existing left-turn lanes and to provide a consistent four-foot wide shoulder for bicycles were not seen as problematic by Scott. Additionally, the proposed sidewalk extension along the east side of Route 7 south of the Falls Road intersection was viewed as a non-controversial proposal. Providing walkways along the perimeter of parklands is acceptable.
3. **Falls Road:** The proposed sidewalk on Falls Road was not a major concern for Scott. The suggestion was made that a flush sidewalk be provided at the General Store. Larger vehicles parked at the store may partially block the sidewalk.
4. **Harbor Road:** Scott felt that the green space impacts of the proposed parking replacement would be unacceptable under Section 106 and 4F regulations. Presumably, the four lost parking spaces could be replaced elsewhere in the village hence there could be a viable and prudent alternative to the removal of green space. Scott recognized that there may be no viable and reasonable alternative to the addition of a left-turn lane on Harbor Road. Consequently, anticipated impacts to the existing greenbelt may be found acceptable with respect to state and federal regulations.
5. **Roundabout:** Scott examined a plan prepared by Stantec for a roundabout at the subject intersection. The Scott found the impacts to the Town park to be unacceptable under both state and federal regulations.
6. **Action Items**:

    a. Per Scott's suggestion, Stantec to prepare and submit for his review and comment a new plan for Harbor Road that shows the left-turn lane addition but no replacement parking. Three parallel parking spaces would remain where there are presently seven perpendicular spaces. Lane widths should be narrowed to the extent possible and a four-foot wide sidewalk could be used to limit green space impacts. The sidewalk should be shifted south and a greenbelt provided with new tree plantings. Scott can issue an opinion regarding the compatibility of this plan with Section 106 and 4F regulations.

b. Per Scott's suggestion, Stantec to prepare and submit for his review and comment the draft roundabout plan. Scott can issue an opinion regarding the incompatibility of this plan with Section 106 and 4F regulations.

c. Stantec to schedule another Committee meeting to be held within the next two weeks to prepare for future meetings with the Planning Commission and Selectboard.

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

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Meeting Notes

Project Committee Meeting

Shelburne US7/Harbor Rd/Falls Rd Scoping / 195310774

Stantec

Date/Time:	July 24, 2013 / 8:00 AM
Place:	Project Site
Next Meeting:	TBD
Attendees:	Dean Pierce, Paul Bohne, Derek Lyman, Jason Charest, John Zicconi, Greg Edwards, Rick Bryant, Scott Newman, Kaitlin O'Shea
Absentees:	None
Distribution:	Attendees plus, Spencer Palmer, Joshua Schultz, David DeBaie

Item:

1. **Meeting Agenda:** Purpose of meeting was to review potential historic resource issues with Scott Newman. Primary concern relates to the potential widening of Harbor Road. Additional concerns relate to work within the Route 7 layout and a recently revived roundabout alternative.
2. **Route 7:** Stantec described various improvements within the Route 7 right-of-way that would impact existing green space. Minor widenings to extend the existing left-turn lanes and to provide a consistent four-foot wide shoulder for bicycles were not seen as problematic by Scott. It was pointed out curbs would be extended along Route 7 for the length of the project. Sidewalks would remain where they are. A green space of 5 feet or wider would be maintained and would provide for street trees and pedestrian scale lights. Additionally, the proposed sidewalk extension along the east side of Route 7, south of the Falls Road intersection, was viewed as a non-controversial proposal. No trees will be impacted. Providing walkways along the perimeter of a public park is acceptable.
3. **Falls Road:** The proposed sidewalk on Falls Road was not a concern. The suggestion was made that a flush sidewalk be provided at the General Store. Larger vehicles parked at the store may partially block the sidewalk.
4. **Harbor Road:** Scott felt that the green space and tree impacts of the proposed 3 parking spaces, on the south side and beyond the first driveway, would result in an adverse impact. Therefore removing them would need to be the most feasible and prudent alternative as required by Section 106 and 4f regulations. Given the safety issues of the existing spaces, replacing them with the 3 parallel spaces and recognizing there are other private and public spaces available nearby, Scott indicated this could be a more feasible and prudent alternative. The need for a left turn on Harbor road was also discussed. Given the traffic volumes and existing congestion, the traffic analysis indicates this improvement has the greatest benefit to traffic flow. Impacts of this additional lane are greatly reduced by eliminating the three parking spaces previously mentioned. The existing southside sidewalk and green belt could be replaced within the ROW although they would be shifted southward approximately 3 feet

from the existing location. Consequently, anticipated impacts may be found acceptable with respect to state and federal regulations.

5. **Roundabout:** Scott examined a draft plan prepared by Stantec for a roundabout at the subject intersection. Scott indicated the impacts to the Town park would be considered adverse and subject to Section 106 and 4F regulations. Given there are feasible alternatives with less impact it is unlikely a roundabout would be permitted.
6. **Action Items**:

   a. Per Scott's suggestion, Stantec to prepare and submit for his review and comment a new plan for Harbor Road that shows the left-turn lane addition but no replacement parking. Three parallel parking spaces would remain where there are presently seven perpendicular spaces. Lane widths should be narrowed to the extent possible and a four-foot wide sidewalk could be considered for a limited area to avoid trees. The sidewalk should be shifted south and a greenbelt provided with new tree plantings. Scott can issue an opinion regarding the compatibility of this plan with Section 106 and 4f regulations.

   b. Per Scott's suggestion, Stantec to prepare and submit for his review and comment the draft roundabout plan. Scott can issue an opinion regarding the incompatibility of this plan with Section 106 and 4f regulations.

   c. Stantec to schedule another project committee meeting to be held within the next two weeks to prepare for future meetings with the Planning Commission and Selectboard.

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

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Meeting Notes

Project Committee Meeting No. 7

US Route 7 Falls Road/Harbor Road/ Scoping Study

Shelburne, Vermont

Date/Time:	August 8, 2013 1:30 PM
Place:	Shelburne Town Offices
Next Meeting:	To be determined
Attendees:	Greg Edwards, Rick Bryant – Stantec
	Dean Pierce, Paul Bohne, John Zicconi – Town of Shelburne
	Derek Lyman - VTrans
	Jason Charest - CCRPC
Distribution:	All Attendees, Joshua Schultz, David DeBaie

Summary

Meeting was held to review findings of the historic review conducted by VTrans and prepare for future hearings with the Shelburne Planning Commission and Selectboard. Tentative meeting dates with these groups are September 12 and 24, respectively. Draft presentation materials will be distributed to committee members for review in advance of the hearings.

Discussion Items:

Scott Newman-VTrans Historic Review

- Scott has reviewed a roundabout alternative for the Falls Road/Harbor Road intersection and issued an opinion via email that it is not a viable alternative. A determination has also been requested, (no response yet), regarding widening of Harbor Road to maintain the existing parking count on Harbor Road. It is expected that Scott will likewise declare that this proposal is not viable as there is other replacement parking available in the village.

- Supporters of a roundabout may argue that a single-lane, mini-roundabout be constructed. Dean suggested that roundabout supporters may also suggest that the roundabout be shifted to the northeast so that it lies within the former alignment of Falls Road. Stantec should be prepared to argue that these proposals are not viable as they do not satisfy the Purpose and Need statement (they do not increase capacity relative to existing conditions) and other alternatives exist that have less impact on the historic district.

Harbor Road

- The revised plan for Harbor Road has three lanes, total width 34 feet. The north edge of the roadway does not change. The back of sidewalk shifts approximately four feet to the south on the south side of the road. A four foot green belt is maintained with a narrowing to 2 feet abutting a large tree to remain. Three parallel parking spaces will be provided replacing the existing seven 90-degree spaces located at the corner.

- Kevin Clayton, the landowner of the corner parcel, has asked that angled parking be considered to minimize the loss of parking at the corner. Since angled parking spaces are almost as deep as 90-degree spaces, provision of angled spaces would require a shift in the north curb line of Harbor Road. Stantec to discuss this alternative and request an opinion from Scott regarding the viability of this plan.

- Kevin claims to have legal rights to the spaces abutting his building on Harbor Road but has not produced any legal documents to prove his claim.

<u>Planning Commission</u>

- The Planning Commission may need to be convinced of the merits of the current proposal. For the Commission hearing we should make the following points:

    - Explain the magnitude of the existing traffic problem and how it will become more severe with future growth.

    - Demonstrate how the plan is consistent with the VTrans Complete Streets policy.

    - Note that widenings are proposed in part to accommodate alternative modes (bicycles) and not just vehicles.

    - Explain state's position on historic preservation and why roundabout options do not appear viable.

    - Address the actual widening impacts by showing cross sections at the subject intersection. Field measurements should be taken to determine existing road widths that may have increased, relative to Stantec's survey plan, as a consequence of the recent paving project.

    - Provide images showing the proposed streetscape with vertical elements (trees) creating a canopy and a more "closed in" feeling that may "calm" traffic.

- The DRB will be invited to the Planning Commission meeting. It would be difficult and perhaps unnecessary to schedule a joint meeting with the two boards.

<u>Route 7 Improvements</u>

- Paul is concerned about VTran's willingness to allow new trees within the highway layout based on recent experience on similar proposals. Clear zone issues are not of concern where curbing is provided. (With curbing vertical elements may be placed within 1.5 feet of the roadway edge.) Current plan shows new trees between the sidewalk and edge of roadway. The Town is interested in a maintenance agreement, if needed. Derek suggested that the Town will have to work with VTrans on this.

- Jason questioned the town on the possibility of the raised median on Route 7 at Church Street as shown on Strategy 2 be part of Strategy 4. Islands provided on the north and south legs of this intersection could offer a pedestrian refuge and "gateway" treatment to support traffic calming. Issues to consider include elimination of the existing shoulder that is used for parking of larger vehicles, police department access, blockage of through traffic flows by left-turning vehicles, illuminating the islands (for safety reasons) and maintaining 16-feet wide northbound and southbound travel ways for snowplowing. It was agreed that an island on the south leg, similar to Strategy 2, should be discussed at planned meetings to solicit public comment.

- Paul is still working with the CCTA to relocate bus stops. John suggested moving stops away from the signalized intersection as stopped bus will impact intersection operations.

- Options for restriping Route 7 near the proposed Harrington Village drive were discussed. For now it was agreed to just show "cross-hatch" striping south of the proposed driveway. This decision can be reconsidered during final design.

- Jason requested a copy of Stantec calculations used to support the 400-feet turn-lane length proposed for Route 7 left-turn lanes. Stantec to also complete calculations that demonstrate the operational benefits associated with the longer turn lanes.

<u>Meeting Schedule</u>

- Dean will try to set up the Planning Commission meeting or September 12. The preferred plan should be given to Dean by 9/4/13 to distribute to Commission members in advance of the meeting.

- Paul will try to set up the Selectboard meeting for September 24.

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

STANTEC CONSULTING SERVICES INC.

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Minutes & Agendas

October 2013

A VIDEO RECORDING OF THE MEETING IN ITS ENTIRETY IS AVAILABLE THROUGH VERMONTCAM.ORG. THE WRITTEN MINUTES ARE A SYNOPSIS OF THE DISCUSSION AT THE MEETING. MOTIONS ARE AS STATED BY THE MOTION MAKER. MINUTES SUBJECT TO CORRECTION BY THE SHELBURNE SELECTBOARD. CHANGES, IF ANY, WILL BE RECORDED IN THE MINUTES OF THE NEXT MEETING OF THE BOARD.

TOWN OF SHELBURNE

SELECTBOARD

MINUTES OF MEETING

October 8, 2013

MEMBERS PRESENT: Tim Pudvar (Chairman); Allison Cranmer, Al Gobeille, Gary von Stange, Toni Supple.
ADMINISTRATION: Peter Frankenburg, Finance Director; Dean Pierce, Town Planner.
OTHERS PRESENT: Paul Orzech Sallie Thomas, Dick Elkins, Brian Precourt Greg Edwards, Jason Charest, John Zicconi, Stephen & Deb Mayfield, Kevin Clayton, Sean MacFaden, Matt Chandler, Dorothea Penar, Bill Stuono, Ron Bouchard, Gail Albert, Amy Demetrowitz, Michael Monte, Liz Weir, Heather McKim (Shelburne News).

1. CALL TO ORDER
Chairman Tim Pudvar called the meeting to order at 6:45 PM.

2. EXECUTIVE SESSION
The Selectboard met in Executive Session to discuss personnel matters.

3. RECONVENE REGULAR MEETING
The regular meeting reconvened at 7:04 PM. Tim Pudvar announced there is no report from the Executive Session on personnel matters. Paul Bohne is on vacation for the next two weeks. Peter Frankenburg is filling in on his behalf.

4. APPROVAL OF AGENDA
Changes to the agenda:

- Remove Request by Green Mountain Kenworth (request was withdrawn)
- Possible Executive Session to discuss litigation following regular meeting

5. APPROVAL OF MINUTES
September 24, 2013
MOTION by Allison Cranmer, SECOND by Gary von Stange, to approve the 9/24/13 minutes as written.
VOTING: unanimous (5-0); motion carried.

6. CITIZEN PARTICIPATION
None.

7. ANNOUNCEMENTS and SELECTBOARD COMMENTS/QUESTIONS
Ø Toni Supple said the striped directional arrows on Shelburne Road coming from South Burlington to Shelburne are only pointing west.
Ø Gary von Stange said the arrow to direct traffic into the Shelburne Vineyard is beyond the turn for the vineyard.

8. MANAGER'S REPORT
No report.

9. OLD BUSINESS
Approve Preferred Alternative Produced by Consulting Firm, Stantac, under Auspices of Chittenden County Regional Planning Commission and Presented to Selectboard on September 24, 2013
Jason Charest with Regional Planning gave a synopsis of the four alternatives to address the Route 7/Harbor Road/Falls Road intersection previously presented on 9/24/13.

Toni Supple distributed diagrams of the intersection and proposed the selection be Alternative #4 with the parking on Harbor Road remaining unchanged (remain diagonal) because there does not appear to be any gain with parallel parking and the gain to have a grass strip is at too great a cost (without the grass strip there would be more room for parking). Also, if parking is taken away from the business, the town should consider designating some public parking for employees of the business. Ms. Supple expressed disappointment that the right turn lane from Route 7 onto Harbor Road is removed from the alternative, and suggested relocating the bike lane closer to the sidewalk to allow widening of the road for a turn lane (Stantac advised this is not possible). Tim Pudvar commented when the traffic numbers warrant a turn lane then it is likely a turn lane will be added.

There was further discussion of parking on Harbor Road. Jason Charest, Greg Edwards with Stantec, and John Zicconi, Shelburne's representative to Regional Planning, noted the following:
· The decision for parallel parking was because angled parking is less safe and parallel parking provided two extra spaces. Back-in angled parking was considered and that configuration would provide one additional parking space, but many people are not familiar with using back-in spaces and may try to front end into the spaces.

· Alternative #4 locates the sidewalk in the town right-of-way rather on private property.
· The flow of traffic on Route 7 is not impacted by the parking. The recommended change was based on factual data that angled parking close to the intersection is not as safe as parallel parking.
· The space by the sidewalk and green strip is not unusable. Tables could be set out there.
· VTrans will consider the Selectboard's point of view, but will focus on safety and the Selectboard's point of view appears to put VTrans and the engineers into creating an unsafe situation.
· VTrans cannot help the business with parking because that is not part of the project, but the town can do something on its own. The town will have to request altering the proposed parking because VTrans and the consulting engineers will continue to recommend the best safety option. VTrans will decide if the parking item can be part of the project. Federal Highway must be convinced as well. Amenities are an issue with funding and if the parking is considered an amenity then the state will not accept it or if the state does accept the parking then the feds might not.
· Funding for the project is 80% federal, 10% state, and 10% local money.
· The state historic preservation officer advised there cannot be significant impact on the historic village.

Gary von Stange stated the parking issue could also be viewed as economic vitality. Mr. von Stange spoke in support of exploring the possibility of a legitimate reasonable way to address losing two parking spaces as part of the project. John Zicconi said the consultants did look hard to save the parking and did not find a way for on-street parking. The town can make up the parking. It was noted the parking for Mr. Clayton's business is on town owned property and the town is now proposing to change how the area is used. Town parking is public so deeding spaces to Mr. Clayton for his employees is not an option. There was agreement further discussion of improving parking in the village is needed. Kevin Clayton volunteered to meet with the Selectboard to discuss parking options for his business.

Al Gobeille suggested the project include three lanes on Harbor Road and all other items in Alternative #4 plus nose-in parking. Greg Edwards pointed out with Alterative #4 there is not sufficient room for three lanes on Harbor Road and maintaining the north side curb and green strip to avoid impacting the historic village. Al Gobeille asked if there could be five diagonal parking spaces with three lanes on Harbor Road. Greg Edwards confirmed this can be done, but from a safety point of view the change to parallel parking from drive-in diagonal parking results in a 40% decrease in crashes. With back-in diagonal parking there is a 70% decrease in crashes. John Zicconi stated there is no perfect project, but all projects need to focus on safety. For perspective only two parking spaces in the entire walking village are being impacted.

COMMENTS
Kevin Clayton noted there have been no accident reports indicating the way the parking is now configured is not working or that the parking is impacting the intersection. The parking is self-regulating now. The parking is the same type found all over the village. People will not be patient with parallel parking. Mr. Clayton questioned why the parking by his business only is being changed and cautioned against making a change to parking that makes the village a walking village.

Steve Mayfield asked about the new sidewalk link that is paving over some of the town green. John Zicconi explained the sidewalk is unfinished and this completes the link. The state historic preservation officer felt the link improved safety for walking without a huge loss of the green.

There were no further comments.

MOTION by Toni Supple, SECOND by Gary von Stange, to adopt Alternative #4 with the change that parking be five diagonal spaces and the green strip between the sidewalk and parking spaces be removed. VOTING: 4 ayes, one nay (Allison Cranmer); motion carried.

Allison Cranmer inquired as to why a meeting was called with the consulting traffic engineers by a selectboard member without notifying the full board. Toni Supple explained she asked the consultants about the viability of moving the bike lane to gain space. The inquiry was for information only and the consultant felt the explanation was more understandable by viewing the site plan.

The Selectboard agreed to further discuss parking in the village in the near future.

Public Hearing: Amendments to Shelburne Comprehensive Plan
The public hearing on amendments to the town plan was reopened at 8:01 PM. The following was discussed:

- Natural and Scenic Resources and Land Conservation

o Gary von Stange pointed out under Goals & Objectives, #4 is inconsistent in saying "support the concept of right to farm" with #3 on Page 32 that says "implement the right to farm". Dean Pierce explained the first occurrence pertains to policy and the second occurrence pertains to recommended action.

- Wildlife Habitat Overlay

o There was discussion of actions related to wildlife habitat, existing maps showing these areas, and potential impact on developers. Regional Planning recommends doing a habitat disturbance assessment.
o Al Gobeille asked if an overlay on your land so it cannot be developed constitutes a taking. Dean Pierce said if the buildable lots were subdivided the regulations in effect when the subdivision application and approval were made stand. Gary von Stange briefly explained 'taking' is an eminent domain claim on the land. How much or to what degree is where the disagreement occurs. Al Gobeille suggested a better policy to protect habitat is through the conservation fund because acquisition is property specific and what is approved is known. The proposed language does not take into account property rights or economic issues, only environmental issues. The language needs to articulate with more detail what the town wants to do. Al Gobeille suggested the Planning Commission be asked to study the issue before inclusion in the plan, and provide sample maps. An economic study on impact should be done. The issue should be studied and common language drafted. Add wording saying "consider developing an overlay" and explain what is meant by a "major development proposal".
o Toni Supple spoke in support of the language as drafted.
o Allison Cranmer asked what prompted the addition of a wildlife district to the plan and how it works on developed land and open land. Dean Pierce explained the Natural Resources Committee provided the most input and the same process for adoption of the language would be followed. There is no map now. Suggestion has been made to synthesize existing maps to identify the most important habitat features in the town as the goal.
Ø Gail Albert, Natural Resources Committee, noted it is easier and less expensive for a developer to have information upfront. Ms. Albert suggested the language support the development of mapping to outline the habitat in order that more information could be made available when the subdivision regulations are updated.
Ø Sean MacFaden, Natural Resource Committee, stated the existing maps are outdated and need updating and consolidation which will simplify assessment of wildlife habitat and streamline the regulatory process as well. The intent of

the Natural Resources Committee for inclusion of the language is due to the JAM Golf decision. The town should know where important wildlife resources are located to effectively plan for them. The habitat overlay was not imagined as a no development zone, but just to protect habitat resources. Zoning can determine how. Gary von Stange clarified the JAM decision involved the Vermont National PUD application and South Burlington's zoning relative to scenic views and wildlife habitat. Superior Court ruled the language was vague and unenforceable.
Ø Sallie Thomas asked if development is defined as just houses or includes windmills, solar farms, cell towers, and other types of structures.
Ø Dean Wong pointed out the words say "consider amending" so the item is in the work plan and not an item being implemented.
Ø Dorothea Penar, Historic Preservation Committee, cautioned against 'softening' the language too much. The town plan is looked at to support decisions before the Public Service Board, for example. There must be quantification to support the supposition of impacts. The language should be clear and supportable.
Ø Brian Precourt, Planning Commission, said the Planning Commission will look at the language. There are hundreds of recommended actions in the plan and many recommended actions that are not acted on.

- Historic and Cultural Resources

Ø Dorothea Penar suggested the words "preserve" and "character" remain in the text because the words are standard lingo in historic preservation. Also, the responsibility of the Historic Preservation Committee is to support and maintain the survey of resources as a CLG requirement. Some of the wording changes in the plan changed the responsibilities and commitment of CLG which could impact receipt of federal funding. Ms. Penar suggested the Historic Preservation Committee draft their comments on the Historic and Cultural Resources section of the plan and submit them to the Selectboard for discussion at the next meeting.

MOTION by Allison Cranmer, SECOND by Gary von Stange, to continue the public hearing on amendments to the comprehensive plan until the next Selectboard meeting (October 22, 2013). VOTING: unanimous (5-0); motion carried.

Approve Amendment to Town of Shelburne Traffic Ordinance by Adding a Stop Sign at Intersection of Spear Street and Bishop Road
MOTION by Allison Cranmer, SECOND by Al Gobeille, to approve amendment of the Shelburne traffic ordinance by adding a stop sign at the intersection of Spear Street and Bishop Road.
DISCUSSION: The following comments were made:
· **Matt Chandler, Kelady Drive (private road), said the stop sign placement is about one and a half car lengths from Kelady Drive which will make it very difficult to turn left onto Spear Street. Mr. Chandler suggested aligning Kelady Drive with Bishop Road be considered to make the intersection safer. Some drivers going north do not fully stop at the stop sign.**
· **Liz Weir, Bishop Road, suggested the stop sign be located farther north and cross-hatching be painted on the road surface so the driveway is not blocked. The signage is not good for northbound traffic. Drivers do not stop at the stop sign.**
· **Allison Cranmer suggested the amendment allow for all way stop (three stop signs).**
· **Tim Pudvar stated the Highway Dept. will do the proper alignment and signage.**
VOTING: 4 ayes, one nay (Toni Supple); motion carried.

Gary von Stange noted the effective date of the change in the ordinance will not be until the sign is installed.

10. NEW BUSINESS
Presentation by Michael Monte and Amy Demetrowitz from Champlain Housing Trust for a Project to Create Transitional Housing at the Econo Lodge Motel in Shelburne
Michael Monte, Chief Operating and Financial Officer for Champlain Housing Trust, explained the plan to purchase the Econo Lodge Motel with a focus on transitional housing for people in the state, noting the following:

- The housing will be temporary to help people in need who meet the criteria and have enough points to qualify for a room.
- A range of resources and services will also be offered to people staying at the motel.
- Residents will be referred by the Agency of Human Services, Fletcher Allen, Howard Mental Health Services. Veterans, victims of flood or fire, domestic violence situations, or homeless individuals who meet the criteria could stay at the motel temporarily.
- Length of stay for referrals from Howard Mental Health is not limited. Referrals from FAHC can stay a few days. Referrals from the Agency of Human Services can stay 28 days up to 84 days depending on the criteria that are met.
- There are 59 rooms in the motel. The Agency of Human Services secured 30 rooms. Other organizations have 10 rooms. The remainder will be "over-the-counter" at some point.
- There will be weekly and daily residents. Full time staff and overnight staff will be at the motel. Security will be there during the evening. Security cameras will be installed. The place will close at 8 PM. Calls for rooms after that time will not be accepted.
- November 1st is the target opening.
- The budget for maintenance and upkeep of the approximate five acre site is between $250,000 and $300,000.
- Shelburne police are happy with the plan.
- Champlain Housing Trust has a contract with the Agency of Human Services and will meet with the state in three months to see if the program is working.

Mr. Monte offered to return to the Selectboard on a regular basis to discuss the operation.

Al Gobeille asked if there is any impact on property taxes by the use. Mr. Monte said the property will pay property taxes. The same amount as paid now is budgeted. The property is being purchased for the assessed value.

Toni Supple asked if ex-convicts, homeless, or sex offenders will be allowed at the motel. Mr. Monte explained the residents will come to the motel through the Agency of Human Services or FAHC or Howard Mental Health and must meet the criteria to be allowed to stay.

Ron Bouchard asked if individuals released from prison can stay at the motel. Mike Monte said the individual must meet the criteria. A person who is disabled or homeless and freezing at night and has been in prison in the past could be allowed to stay if the criteria are met. Individuals will be referred after screening. The intent is to provide people in need with a place to stay short term.

Sallie Thomas expressed concern about vulnerable children or people recouping from illness mixing with pedophiles or drug addicts.

Presentation by Peter Frankenburg of the Budget Status for Year Ending June 30, 2013
Shelburne Finance Director, Peter Frankenburg, briefed the Selectboard on the pre-audit status of the budget ending June 30, 2013, noting the following:

- Town general fund budgeted fund balance was $639,061. The actual fund balance was $475,888. The largest variance was due to the Wake Robin tax appeal that had an impact of $333,230.
- Revenue variations for FY2012-13, budgeted versus actual, for items not offset by corresponding expenses was $85,580 more than budget. Revenues were better than budgeted in property taxes, clerk's office fees, highway state aid, grants for police, planning/zoning fees, state current use payment, and cell tower fees.
- Expenditure variations for FY2012-13, budgeted versus actual, for items not offset by corresponding revenues was $259,394 more than budget. Expenditures were more than budget under tax appeals, the Harbor Road slide, police salaries and overtime, the fire station roof, and police gas expense.
- Capital projects done in FY2012-13 include the fire station roof, fire air packs, rescue boat, field mowers, resurfacing the beach boat ramp, LaPlatte overlook and path, Harbor Road sidewalk, Webster Road path, police communications radio transmission upgrade, two police cruiser replacements, Harbor Road slide, and a dump truck.

Agreement with Vermont League of Cities and Towns (VLCT) to Provide Assistance to the Selectboard in the Search for a new Shelburne Town Manager
MOTION by Al Gobeille, SECOND by Allison Cranmer, to enter into an agreement with VLCT to provide assistance to the Selectboard in the search for a new Shelburne Town Manager.
DISCUSSION: Tim Pudvar announced Paul Bohne, Shelburne Town Manager for the past 13 years, will retire effective on town meeting day in March. The Selectboard will solicit as much public involvement as possible in finding a replacement for Mr. Bohne. Email Tim Pudvar for consideration of involvement on the search committee. Town staff will also be engaged. Bill Stuono asked the details of the agreement with VLCT. Tim Pudvar said an hourly rate will be charged for a total not to exceed $5,000. VLCT has also handled the search for a town manager in Colchester and Brattleboro. Many municipalities use the service.
VOTING: unanimous (5-0); motion carried.

Appointment of Paul Orzech to the Development Review Board for an Unexpired Term Ending in 2015
Paul Orzech explained his interest in applying for the vacancy on the DRB came about when dealing with a homeowners association issue and an application before the DRB by a resident. Mr. Orzech said he is retired and has no prior government experience.

Gary von Stange asked Mr. Orzech about supporting the town plan, zoning bylaws, and subdivision regulations over personal opinion when dealing with applications. Mr. Orzech said he would support the bylaws with applications and then pursue a change in the bylaw if he felt the bylaw was not working.

Toni Supple asked Mr. Orzech if he is affiliated with a developer or a development company. Mr. Orzech said he is not.

MOTION by Gary von Stange, SECOND by Toni Supple, to appoint Paul Orzech to the Development Review Board for an unexpired term ending in 2015.
DISCUSSION: Al Gobeille noted in the past the Selectboard has gone into deliberative session before making a decision. The Selectboard agreed and convened deliberative session at 9:24 PM then returned to regular session at 9:32 PM to take action on the appointment.
VOTING: unanimous (5-0); motion carried.

Request from Green Mountain Kenworth for Waiver of Late Charges on Sewer Bill
Request was withdrawn by Green Mountain Kenworth.

11. EXECUTIVE SESSION and/or ADJOURNMENT
MOTION by Al Gobeille, SECOND by Allison Cranmer, to adjourn the regular meeting and convene Executive Session to discuss legal matters, and invite Peter Frankenburg to attend. VOTING: unanimous (5-0); motion carried.

The regular meeting was adjourned and Executive Session convened at 9:54 PM.

Adjourn
MOTION by Al Gobeille, SECOND by Gary von Stange, to leave Executive Session.
VOTING: 5-0; motion carried.

The meeting adjourned at 10:10 PM

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TOWN OF SHELBURNE

SELECTBOARD

MINUTES OF MEETING

October 22, 2013

MEMBERS PRESENT: Allison Cranmer, Al Gobeille, Gary von Stange, Toni Supple. (Tim Pudvar was absent.)
ADMINISTRATION: Paul Bohne, Town Manager; Peter Frankenburg, Finance Director; Dean Pierce, Town Planner.
OTHERS PRESENT: Ron Bouchard, Dick Elkins, David Webster, Brian Precourt, Scott Kelly, Peter Gadue, Robert Scharf, Heather McKim (Shelburne News).

1. CALL TO ORDER
In the absence of Tim Pudvar, Allison Cranmer called the meeting to order at 7 PM.

2. APPROVAL OF AGENDA
Add under New Business:

- Certificate of Project Completion

3. APPROVAL OF MINUTES
October 8, 2013
MOTION by Gary von Stange, SECOND by Al Gobeille, to approve the 10/8/13 minutes with the following correction(s)/clarification(s):

Page 1, Announcements, 1st bullet – add "by the LaPlatte Bridge at the Webster Road extension entrance" to the end of the sentence;

Page 2, Old Business, 2nd paragraph, sentence reading "Ms. Supple expressed disappointment that the right turn lane…" – change "suggested relocating the bike lane" to "had investigated relocating the bike lane";
Page 3, top of page, bullet reading "The state historic preservation officer advised…" – add "to qualify for federal dollars" to the end of the sentence.
VOTING: unanimous (4-0); motion carried.

4. CITIZEN PARTICIPATION
None.

5. ANNOUNCEMENTS and SELECTBOARD COMMENTS/QUESTIONS
Ø Toni Supple mentioned the news coverage on Channel 3 on the Econo Lodge project was very positive.
Ø Al Gobeille said he received several calls about the water at Wake Robin. Paul Bohne explained the town's water has been tested and the results have been fine. There is low chlorine residual in the water which is normal. The result of the last test of the town water is expected on 10/23/13. The town supplies water to Wake Robin which has its own water and distribution system. Bacteria were found in the water at Wake Robin so residents were told to boil their water until the matter can be resolved. The town has been trying to help Wake Robin find the problem.
Ø Allison Cranmer reported the selectboard workshop she recently attended was very informative. Subjects included preparing for town meeting, ordinances, and terminating employees.

6. MANAGER'S REPORT
Paul Bohne reported:

- The September 24, 2013 Selectboard minutes need to be corrected to reflect Bill Stuono appointed to the DRB as a full member, not an alternate.

MOTION by Gary von Stange, SECOND by Al Gobeille, to amend the 9/24/13 Selectboard minutes to reflect that Bill Stuono was appointed to the DRB as a member and not an alternate. VOTING: unanimous (4-0); motion carried.

- Streetlights have been ordered. Green Mountain Power is ready to install once the lights are received.
- Results of the streetlight survey will be presented at the next Selectboard meeting. Green Mountain Power will be able to continue working through the list with installations. (Allison Cranmer noted survey information on the undergrounded utilities is needed for the budget.)
- A second estimate (from B&R Electric) for the installation of the streetlight at Stokes/School was higher than the quote from Green Mountain Power for the work.
- Staff developed a resolution for Lake Champlain Transportation that was vetted by the staff attorney and the bond council. The report is supportive of recommending the board approve the resolution. If this is done the town can move forward at the Selectboard meeting on November 12, 2013.

7. OLD BUSINESS
Public Hearing: Amendments to Shelburne Comprehensive Plan
The public hearing on amendments to the town plan was reopened at 8:16 PM. The following was discussed:

- Growth and Development

o Toni Supple provided a copy of minutes from last year reflecting discussion of the growth figure of 110. Ms. Supple recalled the Planning Commission agreed to language saying “by no more than 110”, but the text in the town plan reads “an average of 110”. An average needs beginning and end points.
o Al Gobeille pointed out the issue is having a cap versus an average and the language addressing growth over time rather than growth at one time. The language in the town plan should not hinder or limit growth or prevent the town from having another development like Wake Robin.
o There was further discussion of the growth figure of 110 and language referring to an average or a cap (“no more than”). Gary von Stange pointed out the figure of 110 in the town plan denotes the historical trend in the town.
o Following further discussion the Selectboard agreed an average growth rate over time should be indicated in the plan, and the sentence reading: “This growth rate should not be taken as a goal to be achieved” should be included.
o The text in the plan should be consistent in saying “an average of 110 persons”.
o Regarding Recommended Action #1 – Gary von Stange stressed the Selectboard needs to discuss the sewer policy before any text pertaining to sewer allocation or sewer policy is included in the plan. Paul Bohne will add this item to the next agenda for discussion.
o Regarding Recommended Action #5 – following discussion the Selectboard wanted the language in the 2007 town plan for this item rather than the current language.
o Regarding Recommended Action #7 – Dean Pierce explained the language says to be more proactive in planning residential, commercial, and residential/commercial development in a pedestrian friendly way with connections between developments. Al Gobeille expressed concern about forcing business owners to invest in “sidewalks to nowhere”. There was discussion of the meaning of “multi-use area” versus “mixed use area”. Allison Cranmer suggested the language read “mixed use area that encourages a pattern convenient and appropriate for pedestrians….”. Following further discussion there was agreement to have the language read “…encourage connectivity while simultaneously considering economic concerns…”
o Regarding Recommended Action #6 – Gary von Stange objected to saying in the town plan that an economic development officer will be hired by the town because the town plan should not be specifying personnel positions in the town. It was suggested the language be ‘softened’ to say “encourage having an economic development officer”. Al Gobeille opined the language in the town plan is not supportive of growth and puts constraints on growth so having the position would be in conflict with the town plan as currently drafted. Following further debate of the language in the plan relative to the economic development officer the Selectboard agreed to strike the language completely.

MOTION by Gary von Stange, SECOND by Al Gobeille, to continue the public hearing on amendments to the comprehensive plan until the next Selectboard meeting (November 12, 2013). VOTING: unanimous (4-0); motion carried.

Set Hearing Date on Amendments to Zoning Bylaws Previously Forwarded to Selectboard by Planning Commission
MOTION by Gary von Stange, SECOND by Al Gobeille, to set the hearing date of November 26, 2013 on the amendments to the zoning bylaws previously forwarded to the Selectboard by the Planning Commission. VOTING: unanimous (4-0); motion carried.

The sewer policy discussion will be included on the agenda for the November 12, 2013 meeting.

8. NEW BUSINESS
Presentation by Scott Kelly with Utility Services of the Asset Management Program for the South Water Tank
Scott Kelly, water system consultant with Utility Service Company, presented an asset management plan for the south water tank and noted the following:

- Utility Service Company is a water tank maintenance and management company with clients across the country.
- Utility Service Company has been in operation since 1963.
- Services offered to Shelburne for the south tank include assessment of the tank, rehabilitation, asset management, cleaning, maintenance, communications (cell antenna).
- The south tank needs full renovation. Upfront renovation cost for the south tank, exterior and interior, is $422,022.
- The asset management program through Utility Service Company provides annual inspection, cleaning, repair and preventative maintenance, exterior/interior coating renovation, tank related engineering services, and emergency repairs. A lifetime warranty is offered.
- The focus of the asset management program is maintaining the tank properly and not allowing the tank to go to failure. The cost of a new tank in the same location would be in excess of a million dollars.
- The upfront renovation cost is paid in installments of $88,543 over six years (2014-2019) and then beginning in 2020 a flat annual fee of $24,211 is paid for the asset management program. The program is renewed annually.
- Champlain Water District is in the program for their water tanks.

Gary von Stange asked for assurance that the company is financially viable to support the lifetime warranty. Mr. Kelly will provide the assurances.

Peter Gadue, Shelburne Water Commission, mentioned past practice has been to bond to cover the cost of painting the tank ($250,000). The water rate is increased to cover the cost of the bond. Having an asset management plan through Utility Service Company means the company will handle all the maintenance for a set cost and assume all the risk with the tank. The water rate will have to be increased to cover the cost of the management plan. Toni Supple asked if bids were solicited for painting and maintaining the tank. Mr. Gadue confirmed bids were received and the best bid chosen.

Ms. Supple asked if other companies like Utility were contacted for an estimate. Paul Bohne said to date only Utility has been contacted. Al Gobeille pointed out there are other scenarios to consider including a new tank, repair of the existing tank, contracting out the maintenance, or turning over the tank to Champlain Water District (CWD will only take tanks in good condition and without cell antennas).

There was mention of revenue from the cell antennas benefiting the town as a whole not just those on town water.

Amend Shelburne Temporary Sign Ordinance by Correcting Reference to Zoning Bylaws
Paul Bohne suggested this be considered the first reading on the amendment and the second reading be scheduled on November 26, 2013 to coincide with the hearing on the other zoning bylaw amendments previously received from the Planning Commission.

MOTION by Al Gobeille, SECOND by Gary von Stange, that this is the first reading of the amendment to the temporary sign ordinance by correcting reference to the zoning bylaws. VOTING: unanimous (4-0); motion carried.

MOTION by Gary von Stange, SECOND by Al Gobeille, to set the hearing date for the second reading on 11/26/13. VOTING: unanimous (4-0); motion carried.

Appoint Robert Scharf to the Shelburne Natural Resources and Conservation Committee for a Term Ending April 1, 2014
**MOTION by Al Gobeille, SECOND by Gary von Stange, to appoint Robert Scharf to the Shelburne Natural Resources and Conservation Committee for a term ending April 1, 2014. DISCUSSION: Robert Scharf mentioned his experience in natural resources and conservation, especially from the legal side, and his interest in serving on the committee.
VOTING: unanimous (4-0); motion carried.**

Execute Certificate of Project Completion for Municipal Bond Bank for Harbor Road Sidewalk, Webster Road Bike/Ped Path Completed in 2012, and Falls Road/Marsett Road Water Line
Peter Frankenburg explained tax exempt bonds financed the projects and the bond bank wants the town to provide milestones. The certificate affirms the projects were done with the funds that were allocated. The town will now start paying back the bonds.

MOTION by Gary von Stange, SECOND by Toni Supple, to execute the Certificate of Project Completion for the municipal bond bank for the Harbor Road sidewalk, Webster Road bike/ped path completed in 2012, and the Falls Road/Marsett Road water line. VOTING: unanimous (4-0); motion carried.

9. EXECUTIVE SESSION and/or ADJOURNMENT
MOTION by Gary von Stange, SECOND by Toni Supple, to adjourn the regular meeting and convene Executive Session to discuss personnel matters. VOTING: unanimous (4-0); motion carried.

The regular meeting was adjourned and Executive Session convened at 8:54 PM.

**MOTION by Al Gobeille, SECOND by Gary von Stange, to leave Executive Session.
VOTING: 4-0; motion carried.**

The meeting adjourned at 9:35 p.m.

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January 2013

February 2013

March 2013

April 2013

May 2013

June 2013

July 2013

August 2013

September 2013

October 2013

November 2013

December 2013

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Minutes & Agendas

September 2013

A VIDEO RECORDING OF THE MEETING IN ITS ENTIRETY IS AVAILABLE THROUGH VERMONTCAM.ORG. THE WRITTEN MINUTES ARE A SYNOPSIS OF THE DISCUSSION AT THE MEETING. MOTIONS ARE AS STATED BY THE MOTION MAKER. MINUTES SUBJECT TO CORRECTION BY THE SHELBURNE SELECTBOARD. CHANGES, IF ANY, WILL BE RECORDED IN THE MINUTES OF THE NEXT MEETING OF THE BOARD.

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TOWN OF SHELBURNE

SELECTBOARD

MINUTES OF MEETING

September 10, 2013

MEMBERS PRESENT: Tim Pudvar (Chairman); Allison Cranmer, Al Gobeille, Gary von Stange, Toni Supple.
ADMINISTRATION: Paul Bohne, Town Manager; Peter Frankenburg, Finance Director; Dean Pierce, Town Planner.
OTHERS PRESENT: Dick Elkins, Ron Bouchard, Dan Burks, Brian Precourt, David Webster, Dorothea Penar, Trey Pecor, John Paul, Dale Arango, Peter Gibbs, Matt Ottinger, Harvey & Kay Ottinger, Elissa Best, Janice Nicklas, William Posey, Chris Johnson, Katie Gonyaw, David Cranmer, Tom Zenaty, Amy Dimetrowitz, Heather McKim (Shelburne News).

1. CALL TO ORDER
Chairman Tim Pudvar called the regular meeting to order at 7 PM and announced Executive Session to discuss real estate was not held prior to the regular meeting.

2. APPROVAL OF AGENDA
There were no changes to the agenda.

3. APPROVAL OF MINUTES
August 27, 2013
MOTION by Toni Supple, SECOND by Gary von Stange, to approve the 8/27/13 minutes with the following correction:
MOTION on receipt of the Planning Commission report on the sewer service area should read: "unanimous (5-0)".
VOTING: unanimous (5-0); motion carried.

4. CITIZEN PARTICIPATION
Peter Gibbs, 92 Fletcher Lane
Peter Gibbs expressed complaint about the streetlight being installed on the corner of School Street/Creekside rather than Stokes/School Street which is a very busy intersection. Mr. Gibbs requested the light be relocated to the originally planned location. Paul Bohne explained the solar powered streetlight could not be located where previously planned (southern corner of Stokes/School) because of the large trees. Installing the light on the other corner would have placed two lights only 135' apart (too close). A request was received for the School/Creekside location so the light was installed. The situation will be monitored to confirm if the location is working.

Matt Ottinger, Fletcher Lane
Matt Ottinger stated it is unfair not to have discussed the changed location of the streetlight with the public especially when the light locations were approved over a year ago. Mr. Ottinger spoke in support of installing the lights where originally planned.

Harvey Ottinger
Harvey Ottinger echoed the comments about the light being installed where previously approved and informing the neighborhood of the reason for the change in location. Mr. Ottinger called for remedial action.

Gary von Stange commented the Selectboard should have been notified by the Town Manager if there was a problem with the approved location of the streetlight and the public had a right to know. The procedure that was followed was flawed. Tim Pudvar pointed out the Selectboard does not tell the road crew where to locate culverts. The situation is such with streetlights because the issue is so sensitive. Toni Supple and Allison Cranmer echoed the comments about informing the Selectboard and having a public meeting to hear public comment. Al Gobeille commented the location change may indicate that a solar powered light will not work in the original location of Stokes/School. Paul Bohne stated if the streetlight was installed under the large pine trees the town would look like an idiot. Review of the historical record shows there was no light at the intersection, but was one by the condo entrance. The town would also look like an idiot if two lights were installed only 135' apart. Logic needs to be applied. Staff is not going to survey 160 houses in the neighborhood to confirm something that logically and by common sense should be done.

The Selectboard will include streetlights on the next Selectboard agenda for further discussion.

5. ANNOUNCEMENTS and SELECTBOARD COMMENTS/QUESTIONS
Ø Toni Supple invited all to enjoy the cookies she brought to the meeting.
Ø Gary von Stange expressed concern about an email from the Town Manager he received that appeared to promote form over substance, distinction without a difference in trying to avoid the open meeting laws. The email suggested people speak with one or two Selectboard members in private and then have the Selectboard members speak with other

members of the board. Mr. von Stange said he found this to be inappropriate and should not be continuance.

6. MANAGER'S REPORT

Town Manager, Paul Bohne, reported the following:

- Results of the survey sent out to neighborhoods to gather information on the reinstallation of streetlights shows which poles are wanted with lights and without lights plus general comments from the respondents. Discussion of the results of the survey will be on the agenda for the September 24, 2013 meeting.

7. OLD BUSINESS

Public Hearing: Amendments to Shelburne Comprehensive Plan

The public hearing was reopened at 7:24 PM. The following was discussed:

- Street Lighting

o Toni Supple suggested replacing reference to the town's streetlight policy in #8 with "The town should install street lighting where appropriate. This determination shall recognize different needs…".

o Gary von Stange questioned if cost was factored into undergrounding overhead utility line (#7). Brian Precourt, Chairman of the Planning Commission, said the item was left in the plan because it is a desired element to try to achieve. New development is required to underground utilities. Dean Pierce noted the language was 'softened' from a mandate to a suggestion. "Overhead street crossings" (#11) are utility lines

o Toni Supple recommended item #12, official map, not be included and that an official map for Shelburne should not be done. The Planning Commission in the past was split on the issue with developers on the commission in support and others opposed. There are less than 10 towns in the state with official maps. An official map basically gives the right of first refusal to the town on any land in the town. No development can occur unless it meets what the town has planned per the official map. Dean Pierce noted official maps are traditionally used for transportation facilities, but some communities have been using the map to designate open space or bike paths, and such. Gary von Stange asked if the official map impacts fair market value of the land, and if the highest or best use of the land does not occur then it is a taking of the land by the town. Toni Supple said the town has imminent domain. Al Gobeille said in his experience the town has a set time period to act on imminent domain, and the value of the land is highest and best use of the land, not necessarily the development on the land. Dean Pierce pointed out the benefit of an official map is greater control on the destiny of the community and planning for the future with streets, parks, and such. The official map is an additional tool beyond zoning, subdivision regulations, capital budget, and impact fees to plan for its future in a way that balances community needs with fairness to the property owner that could include compensation. The official map is an implementation tool adopted by the Selectboard. Shelburne does not have an official plan presently, but the language in the plan would allow one to be drafted. Toni Supply cited an article in 2003 entitled "Public Power Private Gain" about 10,000 cases of threatened condemnation of private property. Al Gobeille noted the Burlington waterfront would not have been developed without a public/private partnership. The Selectboard concurred further research is needed on the matter of an official map.

§ Dick Elkins commented with an official map a small group of people make a decision and the map does impact property value.

- Growth Area II Beyond the Village

§ Dorothea Penar expressed concern about the working relationship between the Shelburne Historic Preservation & Design Review Committee and the Planning Commission (needs to be stronger). HPDRC submits comments on applications being reviewed by the DRB, but there is little interaction with the Planning Commission. Much of the development activity in the village impacts historic resources and HPDRC is not always consulted. A procedure needs to be in place to ensure the expertise and skill sets of the people on the committee are used. HPDRC is a Certified Local Government and receives federal funding because there is an historic preservation commission. HPDRC should be consulted on street furniture, lighting, parking, signage and such for impact on historic resources.

§ Bill Posey spoke in support of building patchwork neighborhoods and pocket neighborhoods with smaller houses (900 s.f. – 1200 s.f.), common land, and small private parks to provide diversification in the community and a closer knit community with housing for the elderly, single parents, single people and such. Dean Pierce said there is language in the plan that suggests housing and density be reviewed on a regular basis. Toni Supple asked if there is any area suitable for condominiums or the suggested smaller dwellings. Dean Pierce explained condominium is a form of ownership. The regulations do authorize multi-family dwellings. Al Gobeille added the plan may create the vision, but the zoning has to match the vision. Al Gobeille asked if there is a way to increase density with housing and pocket parks and have a higher quality of life. Dean Pierce stated there is language saying in the village units can be higher when smaller in size structure (requires less land).

§ Dorothea Penar spoke about density in the village and compatibility with historic buildings and the need to diminish scale to avoid dwarfing the historic village. Preserving density is desirable in the village, but also should be considered in other growth areas, such as on Route 7.

§ David Webster spoke in support of spreading out density to other areas with the same services as the village, such as along Route 7.

o Tim Pudvar mentioned reference to form based regulations in the plan. There was discussion of amending the language to indicate that form based code is not a predetermination, but will be in place at some point in time for sections of the town. Gary von Stange suggested a general paragraph on the idea of form based zoning if and when it is adopted. Form based code is being contemplated, but is not a policy. Dean Pierce pointed out there is a statement that narrows the application of form based code geographically in town.

o Toni Supple stated narrow streets, street trees on both sides of the street, and sidewalk on one side (#13, item 6, 3rd bullet) should not be a mandate, but rather should be encouraged and the language should be amended to reflect this. Dean Pierce stated the subdivision regulations include a requirement for street trees which can be waived if appropriate. Removing the language from the town plan does not amend the zoning regulations.

o An example of 'non-motorized connection for travel' is the bike path on Webster Road.

MOTION by Allison Cranmer, SECOND by Al Gobeille, to continue the public hearing on amendments to the comprehensive plan until the next Selectboard meeting. VOTING: unanimous (5-0); motion carried.

Lease Agreement with Lake Champlain Transportation (LCT) for Dry Dock Facility at Shelburne Shipyard and Operating Agreement with LCT for Operation of Facility as part of Requirement for "Public Sponsorship" to Allow LCT to be Eligible for Grant Funds to Refurbish Dry Dock

Al Gobeille recused himself. Paul Bohne reported VEDA has not responded to the town's application as yet. The next VEDA meeting is October 25th. LCT agreed to reimburse up to 10 hours of legal fees. To date the monthly legal retainer has covered the work. The documents received by the Selectboard and LCT address the concerns raised by Gary von Stange.

There was discussion of the legal retainer and billing for services. Many items are covered under the retainer, but court cases and associate work is at the billable rate. Paul Bohne will provide the Selectboard with a copy of the contract.

John Paul, LCT, explained the timeframe for work on the dry dock. Weather is a factor and if work cannot begin soon the project will have to be pushed to the following year. Gary von Stange pointed out the concerns already expressed remain. There is question of whether the town has the authorization to enter into the agreement. Gary von Stange also stressed the town should not incur any costs or be placed at any risk by helping LCT.

Trey Pecor suggested getting an opinion from the Town Attorney on the authorization of the town without VEDA and based on that answer pursuing VEDA if necessary. If the answer is not positive from VEDA then both parties can move on. The dry dock work is needed, but the project can be done in New York (the money would be spent in NY rather than Vermont). Paul Bohne noted VEDA should have an idea of their answer by the next Selectboard meeting (9/24/13) and if the answer is positive then hopefully VEDA can take action on the application by their next meeting on October 25, 2013.

The town will continue to pursue the matter and expedite as much as possible. Al Gobeille returned to the Selectboard.

8. NEW BUSINESS

Presentation by CVU Turf Field Committee on Proposed Project to Install Turf Fields at CVU High School
Fred Palmer gave a presentation on the proposed turf fields at CVU high school and progress to date with fund raising $1.1 million to augment the $1.5 million 10 year bond supported by the school board (the voters must approve the bond). Total project cost is $2.6 million for two synthetic fields, lighting, and seating. The fields will be multipurpose and a long term solution for the community. The fields can be rented out to other entities to generate revenue. Support of the fund raising effort for the fields is requested.

Accept Revised Grant Agreements, Authorize Selectboard Chair to Execute Revised Grant Agreements, and Approve Resolution on Revised Grant Agreements in Support of Harrington Village Project
Paul Bohne recused himself. Dean Pierce explained there are two agreements, one with Champlain Housing Trust and one with Cathedral Square.

MOTION by Allison Cranmer, SECOND by Al Gobeille, to approve the revised grant agreements, authorize the Selectboard Chair to execute the revised agreements, and approve/sign the resolution on the revised grant agreements in support of the Harrington Village project.
DISCUSSION: Dean Pierce stated the agreements have been reviewed and the Town Attorney did not have a problem bifurcating the agreements. Toni Supple suggested language on the successor of the contact person be added. Dean Pierce said the state modifies the contracts if there is a change in leadership. Amy Dimetrowitz said the authorizing agent for the town typically is the Town Manager. Due to circumstances the signer in Shelburne is the Selectboard Chairman. Toni Supple suggested the language say the authorizing agent can be the town manager or the selectboard chair. There were no further comments.
VOTING: unanimous (5-0); motion carried.

Accept Revised Administrative Agreement, Authorize Selectboard Chair to Execute Revised Administrative Agreement, and Approve Resolution on Revised Administrative Agreement in Support of Harrington Village Project
MOTION by Allison Cranmer, SECOND by Gary von Stange, to approve the revised Administrative Agreement, authorize the Selectboard Chair to execute the revised agreement and approve the resolution on the revised Administrative Agreement in support of the Harrington Village Project.
DISCUSSION: Toni Supple asked about the change in the Administrative Agent from Colleen Haag to shared responsibility between the Town Clerk and Town Planner. Dean Pierce confirmed Colleen Haag is the administrative agent and provided the current document to the Selectboard.
VOTING: unanimous (5-0); motion carried.

The resolutions and agreement were signed. Paul Bohne returned to the meeting.

Progress Report from Social Services Committee
David Cranmer updated on the Selectboard on the Social Services Committee activities after six months. The role of the committee is seen as gathering information on what other entities in town are doing (charities, social services), advising the Selectboard on social services needs and making recommendations on the budget. A community meeting is planned for 9/18/13 to discuss what is happening in town. A needs assessment is being done to be complete by October. Regional and state agencies will also be contacted.

Presentation of Plan from Tree Advisory Committee to Plant Two Shade Trees on Village Green
Paul Bohne reported the tree committee has been active in reviewing plans for the Green and Parade. Some scrub plantings were removed and replaced with a tree by the church. Two shade trees are proposed to be planted along Route 7.

Discussion of Survey Connected to Municipal Planning Grant to Study Potential Development, Parking Needs, and Regulatory Considerations for the Area East of Falls Road and Route 7
There was discussion of the survey as part of the municipal planning grant requirements. The following was noted:

- The purpose of the survey is to help the Town Planner and consultants in where parking could be located in the village or where roads could be connected, and such.
- The survey was not being conducted to address whether there should or should not be a connector street.
- The survey is driving the land use scenarios developed by the consultants that will include or not include a connector road. The planning study has a marketing piece, parking piece, infrastructure piece, and land use regulation piece.
- The survey has been part of the study since the start in September 2012.
- The survey has a limited purpose and once the data is collected and the scenarios presented there will be public meetings.
- Gary von Stange stated when the item was on the agenda it was not a municipal planning grant for the loop road, but for form based zoning and that was changed without notice to the public and no opportunity for public comment. The entire process was flawed from the start.
- Toni Supple recalled while on the Planning Commission she was opposed to taking money to study the loop road (staff indicated funding for a form based code grant was unlikely, but funding for form based loop road grant was more likely). The survey was ill advised and damaging. The map showed straight grid streets which is what the Selectboard approved in the capital plan process because this worked with the town plan and would work in the

village, but the survey had information on scenarios that are not acceptable and not under consideration.

- Al Gobeille said he asked for the survey item to be on the agenda to learn more as to why the survey was being done. The Selectboard voted on the study over a year ago and held as the number one priority in the capital plan to examine the loop road. The town plan in 2007 included a loop road. The Selectboard wanted a small research study and staff started the process which has taken time. In the course of the work the membership on the Selectboard has changed and allegations have been made. The Selectboard did take the loop road out of the town plan and the capital plan, but there is a huge traffic problem in town and whether it is addressed by a loop road, traffic lights, crosswalks, bus to school, whatever the answer, the situation needs to be addressed because it impacts quality of life. Everyone should be involved.
- There was public comment that the survey questions were biased and planners should be talking to consultants and then getting public opinion. Also, the expertise of town committee members should be used. Doing a survey before dialogue is a way to collect uneducated, uninformed responses. The problem to be solved is not clear with the survey results. Dean Pierce explained if people felt the survey was biased because it leads people to a future where there is a road it is because the study is looking at the impacts of a road, not asking if there should be a road. The survey is to assess benefits and costs of a future that involves a road, and that is the purpose of the study. It is in error to represent the survey will have hard core statistics when it was clear the survey was for the development of scenarios to be used by the consultants and presented at public meetings.
- Concern was expressed that only the four scenarios based on the information will be provided and that the loop road is still being discussed.
- It was noted the town planning has always assumed there will be connecting neighborhoods.
- The consultants found the loop road was not effective, yet the road continues to be included in plans which give the appearance there is a hidden agenda.
- A former plan showed a road connector on the west side of Route 7.

Approve Sewer Allocation in the Amount of 1,575 gpd for Ascension Childcare, Inc. at 2386 Shelburne Road
Katie Gonyaw, Ascension Childcare, provided historical information on sewer usage by the daycare and church in support of the need for less allocation. Ms. Gonyaw requested the Selectboard revisit the use by the daycare after a year of operation and either refund any overpayment or apply the amount to taxes for the site. The state will be approached to reconsider the guideline for early education facilities because typically there is less sewer use due to the age of the children (preschoolers).

Paul Bohne explained the sewer ordinance uses the state guideline, not documented usage, and there are no provisions for flexibility in the town sewer ordinance as written. For the daycare there is a significant difference between the guideline and actual usage.

MOTION by Al Gobeille, SECOND by Allison Cranmer, to approve 1,575 gpd of sewer allocation for Ascension Childcare, Inc. at 2386 Shelburne Road. VOTING: unanimous (5-0); motion carried.

The Selectboard will revisit the usage amount by Ascension Childcare following a year of operation.

Consider Sewer Allocation in the Amount of 40 gpd for Regina Limoge and Matthew Wheeler for an Apartment at 4253 Shelburne Road
MOTION by Al Gobeille, SECOND by Allison Cranmer, to approve 40 gpd of sewer allocation for Regina Limoge and Matthew Wheeler for an apartment at 4253 Shelburne Road. VOTING: unanimous (5-0); motion carried.

Modify 2013 Grand List through Errors and Omissions Process by Increasing the House Site and Homestead Values of Property at 3807 Shelburne Road by $4,300
MOTION by Al Gobeille, SECOND by Gary von Stange, to modify the 2013 Grand List through the errors and omission process by increasing the house site and homestead values of property at 3807 Shelburne Road by $4,300. VOTING: unanimous (5-0); motion carried.

Request from Nancy H. McGowan to Waive Penalty for Late Payment of Property Taxes
MOTION by Allison Cranmer, SECOND by Toni Supple, to grant the request by Nancy H. McGowan to waive the penalty for late penalty of property taxes. VOTING: 2 ayes, 3 nays (Pudvar, Gobeille, von Stange); motion did not carry.

9. EXECUTIVE SESSION and/or ADJOURNMENT
MOTION by Al Gobeille, SECOND by Allison Cranmer, to adjourn the regular meeting and convene Executive Session for the purpose of discussing personnel issues and litigation where premature public knowledge would place the Town of Shelburne at a disadvantage, and to invite the Town Manager to attend. VOTING: unanimous (5-0); motion carried.

The regular meeting was adjourned and Executive Session convened at 10:25 PM.
The Board exited Executive Session at 10:45 PM.

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A VIDEO RECORDING OF THE MEETING IN ITS ENTIRETY IS AVAILABLE THROUGH VERMONTCAM.ORG. THE WRITTEN MINUTES ARE A SYNOPSIS OF THE DISCUSSION AT THE MEETING. MOTIONS ARE AS STATED BY THE MOTION MAKER. MINUTES SUBJECT TO CORRECTION BY THE SHELBURNE SELECTBOARD. CHANGES, IF ANY, WILL BE RECORDED IN THE MINUTES OF THE NEXT MEETING OF THE BOARD.

TOWN OF SHELBURNE

SELECTBOARD

MINUTES OF MEETING

September 24, 2013

MEMBERS PRESENT: Tim Pudvar (Chairman); Allison Cranmer, Al Gobeille, Gary von Stange, Toni Supple.
ADMINISTRATION: Paul Bohne, Town Manager; Lara Keenan, Library Director.

OTHERS PRESENT: Wallace Nolen, Spencer Palmer, Tracy Beaudin, Dick Elkins, Ron Bouchard, David Webster, Matt Ottinger, Harvey Ottinger, Bill Stuono, Greg Edwards, David Grover, Jason Charest, Beverly Remick, Lois Knapp, Patricia Elvin, Norm & Betsy Silcox, Mark Brooks, Stephen & Deb Mayfield, Stephen Selin, Kevin Clayton, Melissa Fletcher, John Zicconi, Paul Grover, Heather McKim (Shelburne News), Mike Donoghue (Burlington Free Press).

1. CALL TO ORDER

Vice Chair Allison Cranmer called the meeting to order at 5:47 PM, in Chairman Pudvar's absence. Al Gobeille and Toni Supple were also in attendance.

MOTION by Al Gobeille, SECOND by Toni Supple, to go into executive session to discuss personnel and litigation.
VOTING: unanimous (3-0); motion carried.

The Board entered executive session
Tim Pudvar, Gary von Stange, and Abby Friedman from VLCT joined the Board in executive session at 6:00 PM.

The Board exited executive session at 6:55 PM.

Chairman Tim Pudvar reconvened the meeting at 7 PM and announced the Selectboard met in Executive Session prior to the regular meeting. Gary von Stange and Tim Pudvar recused themselves from a portion of the Executive Session.

2. APPROVAL OF AGENDA

Changes to the agenda included:

- Removal of the appointment of Laurie Smith as an alternate to the DRB since Mr. Smith has withdrawn his candidacy.
- Postpone until October 8, 2013 consideration of the appointment of Robert Scharf as alternate to the DRB.

3. APPROVAL OF MINUTES

September 10, 2013

MOTION by Gary von Stange, SECOND by Allison Cranmer, to approve the 9/10/13 minutes with the following correction(s)/clarification(s):

Globally correct the spelling of 'countenance' and 'eminent' in the minutes;

Page 3, Amendments to Town Plan, Street Lighting, 3rd bullet, sentence reading "Toni Supple said the town has eminent domain" – insert "it would not if" before "the town has eminent domain";

Page 4, Amendments to Town Plan, Growth Area II in the village, 2nd bullet – clarify the statement reading: "Dean Pierce stated there is language saying in the village units can be higher when smaller in size structure (requires less land)."

Page 7, Survey, 7th bullet, 1st sentence, parenthetical text – delete "form based" in sentence reading "…funding for form based loop road grant…".

DISCUSSION: There was discussion of an official town map and the town having eminent domain with or without an official map.

VOTING: unanimous (5-0); motion carried.

4. CITIZEN PARTICIPATION

Wallace Nolen, Barre, Vermont

Mr. Nolen mentioned two traffic tickets issued to him by a Shelburne police officer, noting the following:

- The tickets are contested.
- This is the final demand for records from July 15, 2013 back to the same time in 2012 in the form requested.
- The state legislature declared that citations in total are public information even if in electronic form.
- If there is not access to the information requested by noontime on September 25, 2013 a lawsuit against the town and its officials will commence.
- The information already provided is only a smidgen of the summations issued during the stated time period and the two contested tickets are only the tip of the iceberg.
- There appears to be a consistent pattern in which tickets are issued and pleas are taken, but that is as far as the matter goes.
- One employee of the town has clearly written bogus tickets. Eighty percent of the tickets issued by this one person never go to trial or dismissal and no word on the disposition after pleading guilty is heard.
- The judicial bureau says the matter is a town issue.

5. ANNOUNCEMENTS and SELECTBOARD COMMENTS/QUESTIONS

Ø Allison Cranmer announced she attended the tree planting ceremony on the town green and it was nice to see people beautifying the town.

Ø Tim Pudvar thanked the Shelburne Police Dept. for the great work along with other agencies in the recent sizable drug bust. The work is dangerous. Much was accomplished.

6. MANAGER'S REPORT

Town Manager, Paul Bohne, reported the following:

- Words of support for the police department's work and ability to solve crimes were echoed.
- A video for the promotion of the community is under consideration. Advertising in the video will pay for the video so there is no cost to the town. A similar video was done for Middlebury, Milton, and St. Johnsbury. Mr. Bohne will work with the Shelburne Business and Professional Association regarding potential assistance with the project.

7. OLD BUSINESS

Public Hearing: Amendments to Shelburne Comprehensive Plan

The public hearing was reopened at 7:17 PM. The following was discussed:

- Page 20 - More information is needed on how the maps in the plan relate to the JAM court case. (Page 20).
- Page 21, #3 – There was discussion of the language saying the town policy of not extending the sewer service area continues. It was noted a decision on whether to change the policy or not has not been made, but as stated in the

plan the sewer service area cannot be changed. Gary von Stange pointed out there are instances in the state of towns not following their town plan.
- Page 21, #5 – Conservation of land was discussed.

o Toni Supple expressed concern about using taxpayer money via the conservation fund to buy and conserve land for the town when 30% of the town's land is already conserved and out of the tax base.
o Tim Pudvar pointed out there is resounding public support for conserving land in the town.
o Allison Cranmer suggested it would be informative to outline for the voters how much land is in conservation, how much should be in conservation, and the associated cost.
o Gary von Stange stated 32% of the land is out of the tax base, but land conservation is overwhelmingly supported by the voters.
o Al Gobeille spoke in support of making no change to the plan to conserve land in the town because the natural resources and conservation plans for the town are incredibly thorough and thoughtful. The leadership of these committees listens to the people in town. Conserving land is one of the top priorities in the town. The amount of money being put into the conservation fund is not at the level where the 32% will be increased at any one time (i.e. there is not enough in the fund to make a large land purchase).
o Paul Bohne noted update of the open space plan by the Natural Resources Committee is anticipated. Also, the percent of conserved land is an area that is not necessarily permanently conserved. For example there is the Abele land that is open with no plans for development at this time.
o The language in the plan says "continue to support". The Selectboard agreed to ask the Natural Resources Committee about impact on the town by the amount of conserved land.

- There was discussion of mandating that utility lines be buried and unreasonable cost burden. The town did not follow the mandate due to cost with the Harbor Road sidewalk project. There was mention of 'softening' the language to say consideration should be given recognizing cost is a factor. There should be separate standards for new construction, renovations, and municipal projects.

Ø Dick Elkins, Shelburne Planning Commission, stated the wording could say "encourage", but should be strong enough to provide the DRB with the necessary tools to make a decision.
Ø Ron Bouchard, Shelburne Planning Commission, urged thinking about how the town will present itself in the end. Using cost as a factor could mean the lines are not buried and the town does not look like what was envisioned.

- Discussion of the policy on noise was postponed until Dean Pierce is present.
- Form based code – Paul Bohne said he wants confirmation from the Selectboard on moving forward with form based code and language in the plan before signing the contract with the consultants to develop the code.

o Al Gobeille pointed out the language in the plan appears to indicate the town is implementing form based code when actually the approach is only exploring how and if form based code will benefit the town.
o Toni Supple added the area under consideration for form based code is on a section of Shelburne Road, not the entire town or village.
o The Selectboard concurred new language needs to be crafted for form based code in the town plan.

MOTION by Allison Cranmer, SECOND by Gary von Stange, to continue the public hearing on amendments to the comprehensive plan until the next Selectboard meeting (October 8, 2013). VOTING: unanimous (5-0); motion carried.

Authorize Town Manager to pursue a VEDA Application on Behalf of Lake Champlain Transportation (LCT) in Support of Enhancing the Authority Necessary for the Town to be a "Public Sponsor" to allow LCT to be Eligible for Grant Funds to Refurbish the Marine Railway
Al Gobeille recused himself from the discussion and decision.

MOTION by Toni Supple, SECOND by Allison Cranmer, to authorize the Town Manager to pursue a VEDA application on behalf of Lake Champlain Transportation in support of enhancing the authority necessary for the town to be a 'public sponsor' to allow LCT to be eligible for grant funds to refurbish the marine railway. DISCUSSION: Paul Bohne reported VEDA staff is waiting to hear from the bond council and is crafting a resolution for the VEDA Board to discuss on October 25, 2013. There was brief discussion of the dry dock project and finding a way for the town to be authorized to legally enter into a contract with LCT.
VOTING: unanimous (4-0); motion carried.

Al Gobeille returned to the Selectboard.

Presentation of Scoping Study Results by Stantec Consulting Services under the Auspices of Chittenden County Regional Planning Commission and Approve Preferred Alternative
Paul Bohne noted the following:

- Over a year ago the Selectboard asked Regional Planning to do a scoping study of the Falls Road/Route 7/Harbor Road intersection and outline a preferred alternative to address traffic congestion.
- The town provided a small match to the cost of the study.
- A public concerns meeting was held in August 2012 to gather information.
- The study was done and a report provide in December 2012.
- There were meetings with stakeholders and further reports.

Jason Charest, Regional Planning, noted:

- Regional Planning does transportation and land use planning in Chittenden County using federal, state, and local funding.
- The Regional Planning Board of Directors is comprised of representatives from each member town. John Zaconi is the representative from Shelburne.
- Regional Planning does work per request of towns.
- Stantec Consulting Services is the consultant on the team working on the Shelburne project and producing the report.
- Three alternatives were identified initially in the study. After further comment the better elements from the first three alternatives were used to form a fourth strategy. Shelburne now needs to select the preferred alternative.

Greg Edwards, Stantec Consulting Services, presented the results of the intersection study that produced four strategies.

Shelburne village is on the National Historic Register which presents special constraints for projects in the village. Identified alternatives and improvements in brief include:

- Strategy 1 – upgrade intersection only. The "complete streets" approach would be used on the roadways. The turn lane on Route 7 would increase to 400' in length. Sidewalk connection would be made.
- Strategy 2 – One-way traffic flow on Falls Road with intersection upgrade. Improvements similar to Strategy 1 plus using Church Street to go north on Rte.7. A traffic signal would be needed at Church St./Route 7 and a left turn lane on Church Street.
- Strategy 3 – Right turn only from Falls Road with intersection upgrade. Church Street would be used to go left onto Route 7.
- Strategy 4 – No Route 7 southbound right turn, a median island on Route 7, narrowing Harbor Road, and left turn lane on Harbor Road.
- Travel demand management and grid streets are other considerations.

Mr. Edwards reviewed components of each strategy including cost. Strategy 4 (cost of $1.4 million) was highlighted as the preferred alternative mainly because there is no adverse impact on historic resources. Next steps in the project include selection of the preferred alternative by the Selectboard and finalizing the scoping study.

John Zicconi stated there are ways besides Strategy 4 to move traffic through the village, but as an historic resource there is need to keep the street as it is now (travel lanes, green strip, sidewalk). If federal funding is used then the alternative with no impact on historic resources is the required selection even if the other choices produce more of a reduction in traffic congestion. The consultants considered how traffic moves in the village, the character of Shelburne, and identified the possible and probable alternative.

Al Gobeille asked what happens when the traffic problem returns after a strategy has been implemented. John Zicconi said the town is encouraged to do ongoing long term traffic demand management, such as grid streets.

Toni Supple expressed concern about having a bike lane share the travel lane with cars, especially with children on bikes. It was noted that typically sidewalks are used by children riding bikes to school and there are school buses as an option, too.

PUBLIC COMMENTS

Paul Grover said he attended the public meetings on the project and did not realize the other alternatives were nonstarters. Mr. Grover questioned why the state is not taking any action now since traffic is already backed up. Greg Edwards said the selection of the probable alternative is based on an opinion that the other strategies will have an impact on historic resources.

Kevin Clayton expressed concern about the impact on his business by losing four parking spaces with the preferred alternative when the town plan speaks to providing public parking (request has been made to post signs for public parking at the village center, but this has not yet happened). The plan shows the train station as a park-and-ride area, but this is not the case as yet. Mr. Clayton said he has not had any accidents with the current parking configuration by his business. Parking should not be taken away without allowing a waiver for the business. Mr. Clayton suggested looking at the Route 116 interchange as a possible solution to get traffic off Route 7 through the village. Harbor Road and Falls Road have local traffic which backs up because parents are driving their children to school or going to the gym. Bay Road has become a de facto secondary road to the village. Mr. Clayton also mentioned moving the bus stop will change the nature of moving traffic on Route 7.

Stephen Selin agreed the parking loss with the proposed alternative is a concern. The existing angled spaces do not seem to be a problem. Mr. Zicconi confirmed the consultants were aware of the loss of parking, but help to the Clayton business was beyond the ability of the project. The project cannot create a dangerous situation and having parallel parking or angled parking is not safe with a turn lane being added on Harbor Road.

Tracy Beaudin said as a crossing guard and Shelburnewood resident she would suggest a right turn arrow on Falls Road going north on Route 7 and modifying the pedestrian crossing light when Falls Road is green. Moving the "Do Not Block Driveway" sign closer to the driveway of the restaurant would be good and lines painted on the road. Having a median by Church Street may impact large trucks delivering to the supermarket. John Zicconi stated VTrans would like to eliminate access to the Bearded Frog restaurant so close to the intersection, but the project does not address this. Future management of traffic can address this.

David Webster said he still sees times when traffic is backed up on Route 7 and there is no one on Falls Road or Harbor Road so perhaps the timing of the traffic signal should be adjusted. Greg Edwards explained one car on the side road can trigger a light cycle. The cycle now is 120 seconds. Toni Supple asked about a "smart" traffic light. Mr. Edwards stated adaptive traffic controls with cameras is a great benefit in a coordinated system where intersections "talk" to each other. Having only one smart light is not a solution.

Harvey Ottinger suggested a police officer direct traffic at the intersection at specified times during the day. Jason Charest stated a traffic signal is more efficient and cost effective.

Stephen Mayfield spoke in support of Strategy 4, but asked why the bus turnout is moving south rather than north. John Zicconi said there is room headed south, but not north. Paul Bohne added CCTA will move the stop from the Bearded Frog to Falls Road. The goal is to move away from the Mobil Station.

There were no further comments.

MOTION by Allison Cranmer, SECOND by Al Gobeille, to table discussion and action on the scoping study recommendations until October 8, 2013. VOTING: unanimous (5-0); motion carried.

Approve Installation of Streetlights in Neighborhoods Where Lights Existing Before January 26, 2010 and Where Poles are Present

Tim Pudvar mentioned the recent records request has occupied Paul Bohne's time at the expense of fully addressing the streetlight issue. Mr. Pudvar said he viewed the streetlight installation on School Street and agrees the initial location was not practical.

MOTION by Al Gobeille, SECOND by Allison Cranmer, to ask the Town Manager to get at least two cost estimates for a streetlight on the corner and that the Selectboard will take action at the next meeting. <u>DISCUSSION</u>: Paul Bohne stated one estimate for the light is $9,500. Getting a second estimate may be

difficult in such a short timeframe due to the current workload. Gary von Stange stated with the full workload staff should not be burdened with getting a second estimate when the amount will likely be the same.

PUBLIC COMMENTS

o **Lisa McCullough, Stokes Lane, said the light at Davis/School causes glare when turning off Stokes onto School which is not safe. The light shine needs to be downward.**

o **Stephen Selin stated a $10,000 light seems to conflict with earlier comments about fiscal responsibility. The change on Bacon and Falls have worked well. Fewer streetlights are good. Use the streetlights or money elsewhere in town.**

o **A gentleman in the audience spoke in support of getting another bid, especially if the cost is $9,500 for one light. Solar is $5,000 and there is a location for a solar light.**

There were no further comments.

VOTING: 3 ayes, 2 nays (Supple, von Stange); motion carried.

Paul Bohne reported staff is in the process of surveying households with streetlights on power poles. Neighborhoods with power lines underground will also be surveyed. The survey asked if all, none, or some lights are wanted and which ones. Responses from Longmeadow and upper Hullcrest have been compiled.

MOTION by Al Gobeille, SECOND by Allison Cranmer, to replace all the streetlights on the document for Longmeadow (nine lights) and Hullcrest (11 lights) for a total of 20 streetlights.

DISCUSSION: The lights will be LED, cut off fixtures, 16' up on the pole. The cost is $350 with a 50% rebate from Efficiency Vermont. Green Mountain Power will install the lights at a cost of $200 per hour (two or more lights can be done in an hour).

COMMENTS

o **Norm Silcox confirmed the location and height of the reinstalled streetlights and suggested a shield be installed behind the bulb to prevent the light from shining on houses.**

There were no further comments.

VOTING: unanimous (5-0); motion carried.

8. NEW BUSINESS

Introduce New Pierson Library Director, Lara Keenan

Melissa Fletcher, Chairwoman of the Pierson Library Board introduced Lara Keenan, Library Director. Ms. Keenan stated her goal as director is to reach out to the townspeople and work closely with town staff.

Appoint Bill Stuono as Alternate to the Development Review Board to fill an Unexpired Term Ending 2015

Bill Stuono's qualifications were reviewed (Masters in Urban Planning, former member/Vice Chair of the DRB in South Burlington). Mr. Stuono said he is retired for health reasons and sees his role on the DRB as administering the bylaws, not interpretation of the bylaws.

Gary von Stange asked Mr. Stuono if his personal opinion or the bylaws would prevail with an application that met or did not meet the bylaws. Mr. Stuono said as a member of the DRB he would be required to rule as dictated by the bylaws. There are grey areas where the bylaw is not clear. Mr. von Stange asked if a board member following personal opinion that differs from the bylaw is grounds for dismissal from the DRB. Mr. Stuono said the Selectboard would have to decide the matter.

Toni Supple stated Mr. Stuono will be an asset to the DRB.

Al Gobeille expressed concern about a personal agenda for serving on the board and cited a comment made by Mr. Stuono about a piece of private land being worthless in value. Mr. Stuono stated he submitted his comments in writing to the Planning Commission on the matter being referred to by Mr. Gobeille and clarified he commented the land was not likely to be developed (the cost would be prohibitive), not that it was worthless. The comprehensive plan is clear on expansion of sewer service into the rural areas. Mr. Stuono urged the Selectboard to read his comments or view his past service on the South Burlington DRB to confirm his professionalism. Mr. Stuono stressed Mr. Gobeille's interpretation of his comments is erroneous.

MOTION by Toni Supple, SECOND by Gary von Stange, to appoint Bill Stuono as alternate to the DRB to fill an unexpired term ending 2015. VOTING: unanimous (5-0); motion carried.

Appoint Mark Brooks as Alternate to the Development Review Board to fill an Unexpired Term Ending April 1, 2014

Tim Pudvar, Gary von Stange, and Al Gobeille each disclosed their relationship with Mark Brooks and his family. All felt they can be fair and impartial with the appointment.

MOTION by Al Gobeille, SECOND by Allison Cranmer, to appoint Mark Brooks as alternate to the DRB to fill an unexpired term ending April 1, 2014. VOTING: unanimous (5-0); motion carried.

Amendment to Town of Shelburne Traffic Ordinance to Add Stop Sign at Intersection of Spear Street/Bishop Road

MOTION by Allison Cranmer, SECOND by Toni Supple, to approve the first reading of the amendment to the traffic ordinance to add a Stop sign at the intersection of Spear Street and Bishop Road and to warn a hearing on October 8, 2013. VOTING: unanimous (5-0); motion carried.

Approve Request for 210 gpd of Sewer Allocation for 750 Bay Road by Precourt Investment Company

MOTION by Gary von Stange, SECOND by Al Gobeille, to approve the request for 210 gpd of sewer allocation for 750 Bay Road by Precourt Investment Company.

DISCUSSION: Paul Bohne noted the ranch house on the site which had 210 gpd allocation will be replaced with a duplex so an additional 210 gpd allocation is needed.

VOTING: unanimous (5-0); motion carried.

Approve Request for 210 gpd of Sewer Allocation for Lot 21 Sycamore Street by Willowbrook Homes

MOTION by Gary von Stange, SECOND by Allison Cranmer, to approve the request for 210 gpd of sewer allocation for Lot 21 Sycamore Street by Willowbrook Homes.

DISCUSSION: It was noted Lot 21 is the last lot in the Rivercrest development.

VOTING: unanimous (5-0); motion carried.

Acknowledge Receipt of Proposed Amendments to Town of Shelburne Zoning Bylaws

MOTION by Al Gobeille, SECOND by Allison Cranmer, to acknowledge receipt of the proposed amendments to the zoning bylaws.

DISCUSSION: A hearing will be scheduled on the amendments on the last Selectboard meeting in November. VOTING: unanimous (5-0); motion carried.

9. ADJOURNMENT
MOTION by Al Gobeille, SECOND by Toni Supple, to adjourn the meeting. VOTING: unanimous (5-0); motion carried.

The meeting was adjourned at 10:01 PM.

RScty:MERiordan

P.O. Box 88
5420 Shelburne Road
Shelburne, VT 05482
phone: 802-985-5110
fax: 802-985-9550

APPENDIX C

Natural Resources

Memo

Stantec

To:	Greg Edwards South Burlington, VT	From:	Polly Harris South Burlington, VT
File:	Shelburne/US 7/Harbor Road/Falls Road Scoping Project 195310774	Date:	July 3, 2012

Reference: CCRPC Shelburne/US 7/Harbor Road/Falls Road Scoping Project Natural Resource Review

As requested, on June 27, 2012, Stantec Consulting (Stantec) evaluated the natural resources present within the Shelburne US 7/Harbor Road/Falls Road Scoping Project corridor in Shelburne, Vermont. The study area includes an approximately 1,500-foot long section of US 7 in Shelburne, extending from south of Church Street to north of the US 7/Harbor Road/Falls Road intersection. It also includes a section of Harbor Road from US7 west to the railroad crossing, and a section of Falls Road to south of the village green. For the purposes of this review, the study area includes a corridor 50 feet from centerline along these roads. The project also includes a secondary area for alternative analysis. This includes the area surrounding the intersection of Church Street and Falls Road (see Project Area map).

Specifically, as part of this investigation, Stantec identified and characterized observable rare, threatened or endangered (RTE) species, wetlands, streams, wildlife habitat, agricultural land, and conservation zones. Wetland boundaries under state and federal jurisdiction were determined using the technical criteria described in the *2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0).* Following is a summary of our findings.

General Site Description

The project corridor is a developed area that includes existing roadways, roadsides, buildings, sidewalks, utility corridors, and drainage features. Vegetation within the corridor is limited to maintained lawns and ornamental plantings (see Photos 1 - 5).

Natural Resource Review Summary

Review of Existing Materials

According to the Natural Resource Conservation Service (NRCS) Web Soil Survey[1] for Chittenden County, Vermont, soils are mapped as Enosburg and Whately soils, 0-3% slopes; Hinesburg fine sandy loam, 0-3% slopes, and Fill land. The Enosburg and Whately soils are considered hydric as well as farmland soils of statewide importance, while the Hinesburg soils are

[1] Natural Resource Conservation Service Web Soil Survey: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Refer to map for Chittenden County, Vermont. Accessed on June 27, 2012.

considered prime farmland soils. Note that all of these soils types have been disturbed in some way by construction in the project area.

In the secondary study area, soils are mapped as Enosburg and Whately soils, 0-3% slopes and Groton gravelly fine sandy loam, 0-5% slopes. As noted above, the Enosburg and Whately soils are considered all hydric, while the Groton soils are not hydric. These soil types are considered farmland soils of statewide importance.

Stantec used the Vermont Agency of Natural Resources (ANR) Environmental Interest Locator program to assess the likelihood of the presence or absence of mapped Vermont Significant Wetland Inventory (VSWI) wetlands and rare, threatened, and endangered (RTE) plant and animal species. According to this program,[2] there are no VSWI wetlands, RTE species, or significant natural communities mapped within the project area (see attached ANR Map).

Stantec also reviewed the Shelburne Town Plan maps (2006). According to these maps, there are no wetlands or significant wildlife habitat located within the study areas.

Wetlands and Streams
No wetlands or streams were identified within the project corridor.

RTE Species
Stantec identified no RTE plant species during the June 27, 2012 site visit. Because the majority of the area has been disturbed by development, it is unlikely that any RTE plant species occur within the project corridor.

Wildlife and Wildlife Habitat
The project area is a relatively narrow corridor along an existing road, flanked by commercial and residential developments and their parking areas. This narrow corridor has limited wildlife habitat value, and likely supports occasional use by songbirds and transient wildlife species.

Agricultural Land
As described above, according to the NRCS Web Soil Survey for Chittenden County, Vermont, some soils within the study corridor are considered farmland soils of statewide importance or prime farmland soils. However, the project area is not used for agriculture, and the narrow strip alongside the existing pavement does not provide agricultural value as the affected land is likely deemed to be in "urban use." Any impact to these soils would require submittal of a Farmland Conversion Impact Rating Form 1006 to USDA for their authorization.

Park/Conservation Zones
Two town-owned areas are present within the study area: the "village green" located in the triangle south of the intersection of US7 and Falls Road, and the "parade grounds" located north of Church Street. Both of these park lands have local significance and would therefore likely qualify as "Section 4(f)" resources. According to a review of Land & Water Conservation Fund (LWCF) Projects from 1965-2011, no areas within the corridor were purchased with LWCF funds. Therefore, there are no "Section 6(f)" public lands present.

Section 4(f) of the U.S. Department of Transportation Act of 1966 prohibits the "use" of 1) any publicly owned land in a public park, recreation area, or wildlife and waterfowl refuge of national

[2] http://maps.vermont.gov/imf/sites/ANR_NATRESViewer/jsp/launch.jsp

Reference: **CCRPC Shelburne US 7/Harbor Rd/Falls Rd Scoping Project**
Natural Resource Review

state, or local significance, or 2) any land from a historic site of national, state, or local significance (collectively "Section 4(f) resources"), unless there is no feasible and prudent alternative to the use of such land and the project includes all possible planning to minimize harm to the resource.

Summary

In summary, the "village green" and the "parade grounds" are two publicly-owned park lands within the project corridor. These areas would likely be considered "Section 4(f)" resources due to their local significance, and impacts to these resources should be avoided.

STANTEC CONSULTING SERVICES INC.

Polly Harris
Environmental Project Manager
Polly.Harris@stantec.com

Reference: **CCRPC Shelburne US 7/Harbor Rd/Falls Rd Scoping Project**
Natural Resource Review

Shelburne US 7/Harbor Road/Falls Road Scoping Project Photos

Photo 1. View south from the US 7/Harbor Road/Falls Road intersection showing maintained lawn, sidewalks, utility corridors, and historic structures. 6/27/12

Photo 2. View looking east on Harbor Road of residential development, landscaping, and utility corridors within the study corridor. 6/27/12

Reference: **CCRPC Shelburne US 7/Harbor Rd/Falls Rd Scoping Project**
Natural Resource Review

Photo 3. The village green is located south of the intersection of US 7 and Falls Road. 6/27/12

Photo 4. View looking north along US 7 at the Church Street intersection, with a portion of the "parade grounds" shown. 6/27/12

APPENDIX D

Historic Resources

Historic Structures Assessment for the Village Center Traffic Circulation Improvement Scoping Study
Shelburne, Vermont

Prepared for:
Stantec
55 Green Mountain Drive
South Burlington, VT 05407

Prepared by:
Suzanne Jamele
Historic Preservation Consultant
1 High Street
Plainfield, Vermont 05667

July 2012
Revised: May 6, 2013

Introduction

This report will provide comments on the above-referenced project pursuant to 36 CFR 800.4, regulations established by the Advisory Council on Historic Preservation to implement Section 106 of the National Historic Preservation Act. Project review consists of evaluating the project's potential impacts to historic buildings and structures, historic districts, historic landscapes and settings, and known or potential archeological resources.

This final report supplements the preliminary report prepared in July 2012 which identified historic resources within the proposed project's Area of Potential Effect (APE), "the geographic area within which the project may cause changes to the character or use of the historic properties" [36CFR 800.2(c)] that are listed on or appear to be eligible for listing on the National Register of Historic Places. This final report provides a preliminary assessment of effect for three proposed project alternatives, referred to in this report as strategies. A site visit was conducted by the consultant on July 11, 2012, at which time photographs were taken. File review to identify sites in the project area was undertaken on June 26, 2012 at the Vermont Division for Historic Preservation in Montpelier, VT. Research was conducted at the Vermont Historical Society Library in Barre.

Project Description

The proposed project is being planned by the Town of Shelburne and the Chittenden County Regional Planning Commission. Improvement of this busy intersection has been under consideration by the Town of Shelburne for a number of years and has been part of several studies. The proposed undertaking will upgrade the intersection, and area around, US Route 7/Harbor Road/Falls Road south to Church Street in Shelburne's village center. The primary goal of the project is to improve vehicular and pedestrian mobility at the intersection in the center of Shelburne Village. The project area begins on US Route 7 north of the village, just beyond the buildings of the Shelburne Inn, at 5203 US Route 7, and continues southerly to a point north of the property at 5511 US Route 7, which contains the offices of the Shelburne Museum. The project area extends westerly on Harbor Road to a point just beyond the railroad tracks near the building at #102 Harbor Road. The project area also extends southerly on Falls Road to a point near the building at 77 Falls Road.

A secondary project area, at the intersection of Church Street and Falls Road, was identified as an alternative project area.

The project explored several options for improving the intersection including:
a. replacing the signalized intersection with a roundabout
b. improving the existing alignment
c. making Falls Road one way with improvements at the US Route 7/Church Street intersection

The actual construction area has not yet been defined and until it is, the proposed project's Area of Potential Effect is along both sides of US Route 7, Harbor Road, Falls Road, the

US Route 7/Church Street intersection, and the Falls Road/Church Street intersection as described in the previous paragraphs. The APE corresponds to the area adjacent to and within the red line labeled "Project Area" on the attached map and the described area at the Falls Road/Church Street intersection indicated on the map with an arrow.

US Route 7, the major north-south highway in western Vermont, is a heavily traveled two-way, two-lane road that runs south from Burlington through the heart of Shelburne Village. In the project area, the road is lined with small-scale 19th and early 20th century commercial, civic, educational, religious, and residential properties as well as two village greens. Harbor and Falls Roads, are paved local roads with 19th century residential and commercial buildings. Along all roads, buildings have shallow setbacks with lawns, as well as mature trees and hedges in many locations. All roads are lined with existing sidewalks and green strips. A triangular-shaped green space faces the intersection of the roads which has grown into a large signalized intersection. A village green, known as the Parade, rests to the south between US Route 7 and Falls Road, fronting on Church Street. The renown Shelburne Museum is located at the southwestern end of the project area.

Historic Properties

The proposed project is located almost entirely within the boundaries of the Shelburne Village Historic District, which is listed on the National Register of Historic Places. Only a small southwestern corner of the project area, located in front of the "Weed House"- the most northeasterly building of the Shelburne Museum, is outside the historic district boundaries. The district boundary crosses US Route 7 at the northern lot line of the Museum and then runs southerly along the east side of Route 7. The district extends beyond the project area in all other directions.

Route 7 was laid out in 1789 as the stage road running south from Burlington to Middlebury. Historic maps indicate that Falls Road, which meets Route 7 in the center of the village, was extant by the late 18th century, linking the original settlement in Shelburne Falls to what was to become the primary village center. The two roads form an inverted "V" bisecting the village. Running west from this intersection, Harbor Road, was also in place by the late 18th century. Thus, the crossroads intersection in the center of the village is a configuration that has been extant since the early years of the community and is the area around which the village developed. In 1796 early settler Benjamin Harrington built the public house, now known as the Shelburne Inn.

During the first half of the 19th century, development proceeded southward from the intersection on both sides of the green, along Route 7 and Falls Road where houses and shops were built. After 1850, when the railroad arrived, the commercial center shifted to Harbor Road. Increasing prosperity and population growth in the years following the arrival of the railroad, led to the construction of Italianate and Queen Anne style homes and churches in the village. The public school and town hall on Route 7, built in the Neo-Classical style, reflect design standards of the

1920s while the Dutch Colonial house at the southwest corner of the district represents typical single family home construction of the period. The Moderne style gas station on the corner of Route 7 and Harbor Road reflects mid-century iconic automobile era commercial design.

Historic photos from the early 20th century, looking south from the crossroads, show the triangular green space, long a focal point in the center of the village, nestled between Route 7 and Falls Road. However, until the mid-20th century, the green space was composed of two sections, a layout that is clearly evident on the 1869 Beers map. Originally the existing triangle in front of the former Pierson Library, was smaller and there was a separate triangular “island” immediately to the north. Falls Road approached the two green areas and formed a “Y” on either side of the northern green area. The two areas were separated by a leg of Falls Road that turned south onto US Route 7. That leg was eliminated and grassed over. The northern end of the existing green was shortened and paved over on the north end to make room for a 90 degree turn onto Route 7. In 1967 traffic lights were installed at the intersection.

A second green space, that has functioned as the town common and is locally known as “the Parade”, is also located between Route 7 and Falls Road. This rectangular common is situated at the point where Church Street connects the two roads. It is a contributing site (#36) in the historic district. This common was laid out and deeded to the town in 1807 by one if its early settlers, Benjamin Harrington, for use as a training area for the town’s militia. From 1871 to 1926 it served as a playground for the Village School. It has long been used as a community gathering spot for celebrations and activities. A rock-faced boulder memorial honoring Benjamin Harrington was placed on the Parade in 1977. It rests along the side of the green facing Church Street. Church Street, with its two masonry churches, frames the southern end of the Parade.

The village streets are lined with buildings that are excellent examples of 19th and early 20th century architectural styles. The buildings date from the early days of settlement in the late 18th century to the mid-20th century and provide a visual record of the town’s history. Buildings are 1- 2 ½ story, largely wood frame, gable roof structures, although there are some brick buildings and three masonry churches. The historic village remains largely intact with new construction set primarily on rear lots, back from the road and therefore visually unobtrusive. Despite the heavy traffic on Route 7 the village maintains the character of a small late 19-early 20th century village center surrounding public green spaces.

Most buildings in the proposed project area are contributing structures in the historic district. Evaluation of the buildings during the July 12, 2012 site visit indicated that all of the structures continue to retain their architectural integrity and status as contributing structures. The motel portion of the Shelburne Inn (#8 in the district) remains noncontributing due to its late 20th century construction date. The ranch house at 8 Railroad Lane (#63 in the historic district), on the corner of Harbor Road, was built in 1970 and also remains noncontributing due to age. The building at 63 Harbor Road (#52 in the historic district), facing the railroad tracks, remains noncontributing due to alteration. The gas station on the northwest corner of the intersection (#72 in the historic district) was built in 1953 and was considered noncontributing due to age at the time the district nomination was prepared (1989). It has since become 50 years old and is an altered but recognizable example of a gas station design created for Texaco c. 1940 by Walter Dorwin Teague. Examples of period gas stations are becoming rare and are a significant resource related to the growth of the automobile era. The building should now be considered eligible for the National Register as a contributing structure in the historic district.

The “Weed House” located in the northeast corner of the Shelburne Museum, is not listed on the National Register and is just outside the southeastern boundary of the historic district. This c. 1850, 2 ½ story, brick, sidehall plan, Greek Revival style, gable front house is in its original location, once part of the functioning village. It has since been incorporated into the collection of buildings owned by the Shelburne Museum and is a contributing structure in this historic resource. The museum, founded in 1947 by Electra Havemeyer Webb, was included in the update of the Vermont Historic Sites and Structures Survey (VHSSS) for the Town of Shelburne, conducted in 2000. The Museum is listed on the State Register of Historic Places (#0413-74) and appears eligible for the National Register as an outstanding example of an open air collection of historic buildings and Americana.

The buildings immediately surrounding the Route 7/ Falls Road/ Harbor Road intersection include the previously discussed gas station in the northwest quadrant, the Shelburne Inn in the northeast quadrant, a c. 1935 gable front house to the south of the Inn, a c. 1890 Queen Anne house at the head of Falls Road on the east side, the triangular green space and c. 1816/1911/1927 former Pierson Library in the triangle between the two roads, and the c. 1851 brick commercial building known as Harrington’s on the southeast corner of the intersection.

A secondary project area, at the intersection of Church Street and Falls Road, has been identified as an alternative project area. This intersection is also located within the Shelburne Village Historic District and the buildings immediately adjacent to the intersection are all contributing structures in the district. These include the c. 1895 St. Catherine’s Church, the c. 1889 St. Catherine’s Parish Hall on the western side of Falls Road and five dwellings on the eastern side of the road whose construction dates range from c. 1880 to c. 1900. These houses are located in the southeastern corner of the historic district.

Assessment of Effect

Three proposed strategies for improvement of the intersection have been prepared at the time of this report. These undated plans are preliminary. Formal findings of effect for Section 106 should be based on final project plans when they become available. It is anticipated that the proposed project will have no adverse effect on any historic structures.

Proposed alternative approaches are:
a. Strategy 1: Intersection Upgrade Only
b. Strategy 2: One-Way Falls Road with Intersection Upgrade
c. Strategy 3: Right Turn Only from Falls Road with Intersection Upgrades

All three alternative strategies will have no direct effects to any buildings or structures. All strategies will include the same additional turning lanes on Harbor Road and Route 7 as it approaches the intersection from the north. They also add a bike lane between the through travel lane and right turn lane on Route 7 as it heads south toward the intersection. All strategies add some additional length of left turn lane approaching the intersection from the south. All strategies will intrude somewhat on green strips between the road and sidewalk and there will be some widening of the extent of paved areas. The greatest differences in the strategies is the approach along Route 7 heading north toward its intersection with Falls and Harbor Roads, and at the Route 7/Church Street intersection. There are minor variations in physical impact along Falls Road.

All strategies will have an effect on the village historic district which is listed on the National Register. This is largely a result of adding additional turning lanes, limited widening of paved areas, and in the case of Strategy 2, adding a median and new traffic signal in the heart of the village, near The Parade and historic churches. While these changes will affect the character of the village center, adding a more urban flavor and scale to its streets, the effect will not be adverse. Care should be taken to preserve as many mature street trees and shrubs as possible and replace those that must be removed. Trees and shrubbery will help soften the impact of the additional travel lanes and areas of pavement.

Strategy 1

- Has the least impact along Route 7 as the extension of the left turn lane extends south only to roughly half way between stations 99 and 100.

- Although the Loop Road is not a part of this project, if it is constructed, this Strategy has a significant impact if the building at 15 Falls Road is removed to allow for the Loop Road connection. This house is listed on the National Register as a contributing structure (#13) in the Shelburne Village Historic District.

Strategy 2

- Has the greatest impact to the historic district in terms of visual effects. The addition of a median at the southern end of the project area, along with a left turn lane running from the median to the Falls/Harbor Road intersection will add a more urban feel to the historic village setting. This, compounded with the addition of turning lanes on Church and Harbor Roads and additional turning lanes on Route 7 approaching from the north, will significantly change the character of the center of the village.

- Along with a median, this Strategy adds a signal at the intersection of Route 7 and Church Street. Placing a second signalized intersection in the heart of this small village will alter the small town nature of the village. Adding this light, along with a median and turning lanes on Route 7 and Church Street in the vicinity of The Parade, will affect the setting of this significant common area, a contributing resource in the historic district.

- Although the Loop Road is not a part of this project, if it is constructed, this Strategy has a significant impact if the building at 11 Falls Road is removed to allow for the Loop Road connection. This house (#12) in the Shelburne Village Historic District, was considered a noncontributing structure due to its age of less than 50 years at the time the nomination was prepared (1989). The building is now greater than 50 years old, having been constructed in 1953. It was built to house the post office that had been located in a building on the corner of Harbor Road where the gas station is now. That building was moved to the Shelburne Museum. Although the 11 Falls Road building has a c. 1970 single story addition, it is otherwise largely intact and appears eligible for the National Register as a contributing structure in the historic district.

Strategy 3

- Less impact to the historic district than Strategy 2 since there is no median or traffic signal at the Route 7/Church Street intersection.

- Otherwise, similar concerns regarding additional turning lanes as with Strategy 2 on Route 7 from Church Street to the Harbor/Falls Road intersection and adding a turning lane on Church Street.

- Similar concern as Strategy 1 regarding removal of building at 15 Falls Road.

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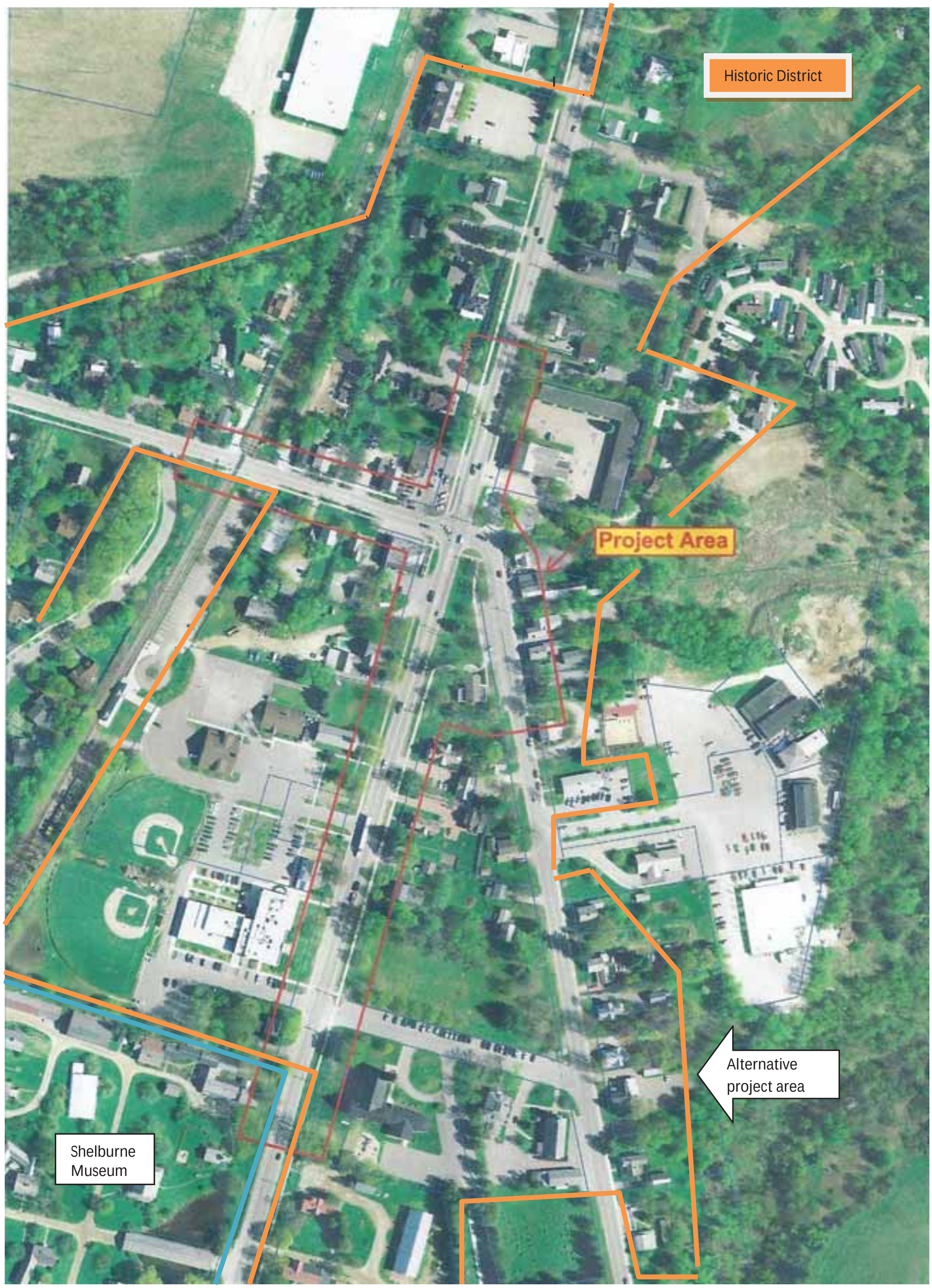
Attachments

1. Historic District and Conceptual Location Map/APE
2. Photographs
3. Shelburne Museum, Vermont Historic Sites and Structures Survey Form #0413-74
4. Shelburne Village Historic District, National Register of Historic Places Cover Sheet, Gas Station description, and district map

Project Area and Historic Building Location Map



Red polygon indicates proposed project area and orange polygon indicates the boundary of the Shelburne Historic District. Blue line shows partial boundary of the Shelburne Museum.

Looking north from triangular green toward main intersection, with brick store on left and gas station to its right.

Looking west on Falls Road at main intersection. Harbor RD begins across the intersection. Gas station is on right.

Looking north on Route 7 with Shelburne Inn on right.

Looking east from Harbor Road across the intersection toward Falls Road.

Looking south across intersection from the gas station toward the triangular green.


Looking north on Route 7 toward the center of the village and the main intersection.


Looking south on the east side of Route 7 toward the Church St. intersection with the Parade on the left.


Looking north on Falls Rd at the Church St intersection.


Looking southeast from Route 7 at Shelburne Inn, HD #9.


Looking east from Rte 7 at modern motel portion of the Inn.


Looking east on Rte 7, north of intersection at HD #7.


Looking east on Rte 7, north of intersection, at HD #6, just outside project area.


Looking south on Rte 7, north of intersection, at HD #74, just outside project area.


Looking west from Rte 7, north of intersection, at the Tracy House, HD #73, and also individually listed on National Register.

Looking west across Rte 7 at gas station, HD #72, now considered contributing.


Looking northeasterly across Harbor RD at HD #71.


Looking northerly across Harbor RD at HD #s 69 & 70.


Looking northerly across Harbor RD at HD #s 62,63 (noncontributing).

Looking southerly across Harbor RD at HD #52 (noncontributing).

Looking southerly across Harbor RD at HD #s 50,51.

Looking westerly across the Rte 7 intersection at the brick commercial building, HD #49.

Looking westerly across Rte 7, south of the intersection, at HD #48.

Looking northwesterly across Rte 7 at the Old Town Hall, HD #47.

Looking northwesterly across Rte 7 at HD #44.


Looking northwesterly across Rte 7 at the former school, HD #43.


Looking westerly across Rte 7 at HD #42.


Looking westerly across Rte 7 at the Weed House, part of the Shelburne Museum.


Looking westerly on Church St at the Methodist Church on the corner of Rte 7, HD #38.


Looking east at the Parade, HD #36.


Looking northerly at HD #35.


Looking southeasterly across Rte 7 at HD #s 33,29.


Looking easterly at the former Pierson Library, HD #32.


Looking northeasterly across Falls RD at HD #12.


Looking northeasterly along Falls RD at HD #s 13,14,15,16.


Looking southeasterly along Falls RD at HD #s 17,18.


Looking westerly across Falls RD at HD #31, just south of the project area of the main

intersection.

Alternative project location at Falls RD/Church St intersection. Looking southeasterly along Falls RD at HD #s 25,26.

Alternative project location at Falls RD/Church St intersection. Looking northeasterly along Falls RD at HD #s 23,24.

Alternative project location at Falls RD/Church St intersection. Looking northeasterly along Falls RD.

Alternative project location at Falls RD/Church St intersection. Looking northwesterly along Falls RD. St. Catherine's Church, HD #28 on corner.


Alternative project location at Falls RD/Church St intersection. Looking southerly across Church Street and along Falls RD.


Alternative project location at Falls RD/Church St intersection. Looking southerly across Church Street at Catherine's Church, HD #28.


Alternative project location at Falls RD/Church St intersection. Looking west across Falls RD at Catherine's Parish Hall, HD #27.

View of Shelburne Village, looking west, in April 1939 with Route 7/Falls Road/ Harbor Road intersection in center of image. Note triangular green has two parts and is bisected by Falls Road.

Courtesy of the University of Vermont Landscape Change Program and the Henry Sheldon Museum.

View of Shelburne Village, looking north, in April 1942 with Route 7/Falls Road/ Harbor Road intersection in center of image. Note triangular green has two parts and is bisected by Falls Road.

Courtesy of the University of Vermont Landscape Change Program and the Henry Sheldon Museum.

STATE OF VERMONT Division For Historic Preservation Montpelier, VT 05602 HISTORIC SITES & STRUCTURES SURVEY Individual Structure Survey Form	SURVEY NUMBER: 0413-74
	NEGATIVE FILE NUMBER: 2000-A-47
	UTM REFERENCES: 18/ 640800/ 4914600 Zone/Easting/Northing
	U.S.G.S. QUAD. MAP: Mt. Philo, VT 7.5 min. series
	PRESENT FORMAL NAME: Shelburne Museum
COUNTY: Chittenden	ORIGINAL FORMAL NAME: Shelburne Museum
TOWN: Shelburne	PRESENT USE: Museum
LOCATION: Shelburne Road, Route 7	ORIGINAL USE: Museum
COMMON NAME: Shelburne Museum	ARCHITECT/ENGINEER:
PROPERTY TYPE: Museum, Other	BUILDER/CONTRACTOR:
OWNER: Shelburne Museum, Inc. ADDRESS: Shelburne, VT	PHYSICAL CONDITION OF STRUCTURE: Excellent Good Fair Poor
ACCESSIBILITY TO PUBLIC: Yes No Restricted	
	STYLE: Federal, Vernacular, Greek Revival, Other
LEVEL OF SIGNIFICANCE: Local State National	DATE BUILT: Various, 1733 to 1988

GENERAL DESCRIPTION:

Structural System

1. Foundation: Stone Brick Concrete Concrete Block
2. Wall Structure
   a. Wood Frame: Post & Beam Balloon
   b. Load Bearing Masonry: Brick Stone concrete Concrete Block
   c. Iron d. Steel e. Other:
3. Wall Covering: Clapboard Board & Batten Wood Shingle Shiplap Novelty Asbestos Shingle Sheet Metal Aluminum Asphalt Siding Brick Veneer Stone Veneer Bonding Pattern: Other:
4. Roof Structure
   a. Truss: Wood Iron Steel Concrete b. Other:
5. Roof Covering: Slate Wood Shingle Asphalt Shingle Sheet Metal Built Up Rolled Tile Other:
6. Engineering Structure: 7. Other:

Appendages: Porches Towers Cupolas Dormers Chimneys Sheds Ells Wings Bay Window Other:

Roof Styles: Gable Hip Shed Flat Mansard Gambrel Jerkinhead Saw Tooth With Monitor With Bellcast With Parapet With False Front Other:

Number of Stories:

Entrance Location:

Number of Bays:

Approximate Dimensions:

SIGNIFICANCE: Architectural Historic Archeological	
Historic Contexts: Entertainment & Popular Culture, Outdoor Recreational Industry	Level of Significance: Local State National

ADDITIONAL ARCHITECTURAL OR STRUCTURAL DESCRIPTION:

RELATED STRUCTURES: (Describe)

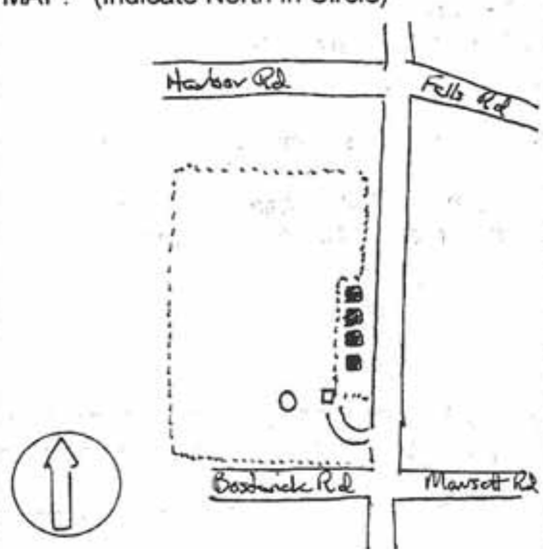
STATEMENT OF SIGNIFICANCE:

The Shelburne Museum was founded by Electra Havermeyer Webb in 1947. The first building of the collection was the Weed House, built c. 1835, and is the only historic structure in the museum original to the site. Over the years, other historic Shelburne structures were moved to the museum grounds. These included: The Blacksmith Shop c. 1800, The General Store c. 1840, the Harrington distillery c. 1800, The Shelburne Railroad Station c. 1890, and the Slocumb House c. 1830. Today, the museum has 28 historic buildings from the New England area as part of its exhibit and owns other historic structures to house administration and curatorial operations.

The museum was established on what were the farmlands of Henry S. Morse.

REFERENCES: A Guide to the Collections, Shelburne Museum.

MAP: (Indicate North in Circle)



SURROUNDING ENVIRONMENT:
Open Woodland Woodland
Scattered Buildings
Moderately Built Up
Densely Built Up
Residential Commercial
Agricultural Industrial
Roadside Strip Development
Other:

RECORDED BY: Pamela Daly

ORGANIZATION: Town of Shelburne

DATE RECORDED: 03/15/2000

NPS Form 10-900 (Rev. 8-86)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property

historic name Shelburne Village Historic District
other names/site number

2. Location

street & number roughly entire village — [ ] not for publication N/A
city, town Shelburne — [ ] vicinity N/A
state Vermont code VT county Chittenden code 007 zip code 05482

3. Classification

Ownership of Property
- [X] private
- [X] public-local
- [ ] public-State
- [ ] public-Federal

Category of Property
- [ ] building(s)
- [XX] district
- [ ] site
- [ ] structure
- [ ] object

Number of Resources within Property

Contributing	Noncontributing	
82	41	buildings
1		sites
		structures
		objects
83	41	Total

Name of related multiple property listing: N/A

Number of contributing resources previously listed in the National Register 2

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this [✓] nomination [ ] request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property [✓] meets [ ] does not meet the National Register criteria. [ ] See continuation sheet.

[signature] - SHPO — 5/30/90
Signature of certifying official — Date

State or Federal agency and bureau

In my opinion, the property [ ] meets [ ] does not meet the National Register criteria. [ ] See continuation sheet.

Signature of commenting or other official — Date

State or Federal agency and bureau

5. National Park Service Certification

I, hereby, certify that this property is:
- [ ] entered in the National Register. [ ] See continuation sheet.
- [ ] determined eligible for the National Register. [ ] See continuation sheet.
- [ ] determined not eligible for the National Register.
- [ ] removed from the National Register.
- [ ] other, (explain:)

Signature of the Keeper — Date of Action constructed in the mid-1960s.

71. House (1 Harbor Road), c.1880.

This 2 1/2 story, 3 x 3 bay, gable front, vernacular house has a 1 1/2 story, 3 x 1 bay, rear west ell. A 1 story, 1 x 1 bay, gabled porch protects the left (W) sidehall entrance whose door has a 1/2 length light over bolection molded panels. The porch has turned posts with scroll brackets on a replacement brick and concrete deck. An L-shaped porch across the front (S) of the ell and rear two bays of the main block is similar to the front porch in decorative treatment; this porch originally covered the entire west elevation of the main block as evidenced by the remaining engaged post near the front corner. This porch, which also has a replacement deck, provides access to entrances in the main block and ell, both of which have doors like that on the front. At the rear of the ell is a one story shed attachment.

Except for an oculus window in the front gable peak, the windows are 2/2 sash with plain architrave surrounds. The first story of the facade features slightly broader 2/2s. Paired scroll brackets with pendant drops decorate the eaves. The house is clad with clapboards with a water table beltcourse, cornerboards, a fascia with extensions below the brackets and bed molding, and molded cornice trim. The roofs are covered with slate. A brick chimney rises from the center of the main block's ridge. The foundation is redstone.

At one time there was a two story, gabled porch at the rear of the main block; evidence for this remains on the clapboards. Currently there is a c.1987, two story deck constructed of pressure treated lumber.

72. Texaco Gas Station (2129 Shelburne Road), c.1953.

This gas station, which is non-contributing due to age, is one of the models created by the industrial designer Walter Dorwin Teague for Texaco in c.1940. The various models were planned to be efficient, adaptable, and easy to clean. This

NPS Form 10-900-a
(8-86)

OMB Approval No. 1024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

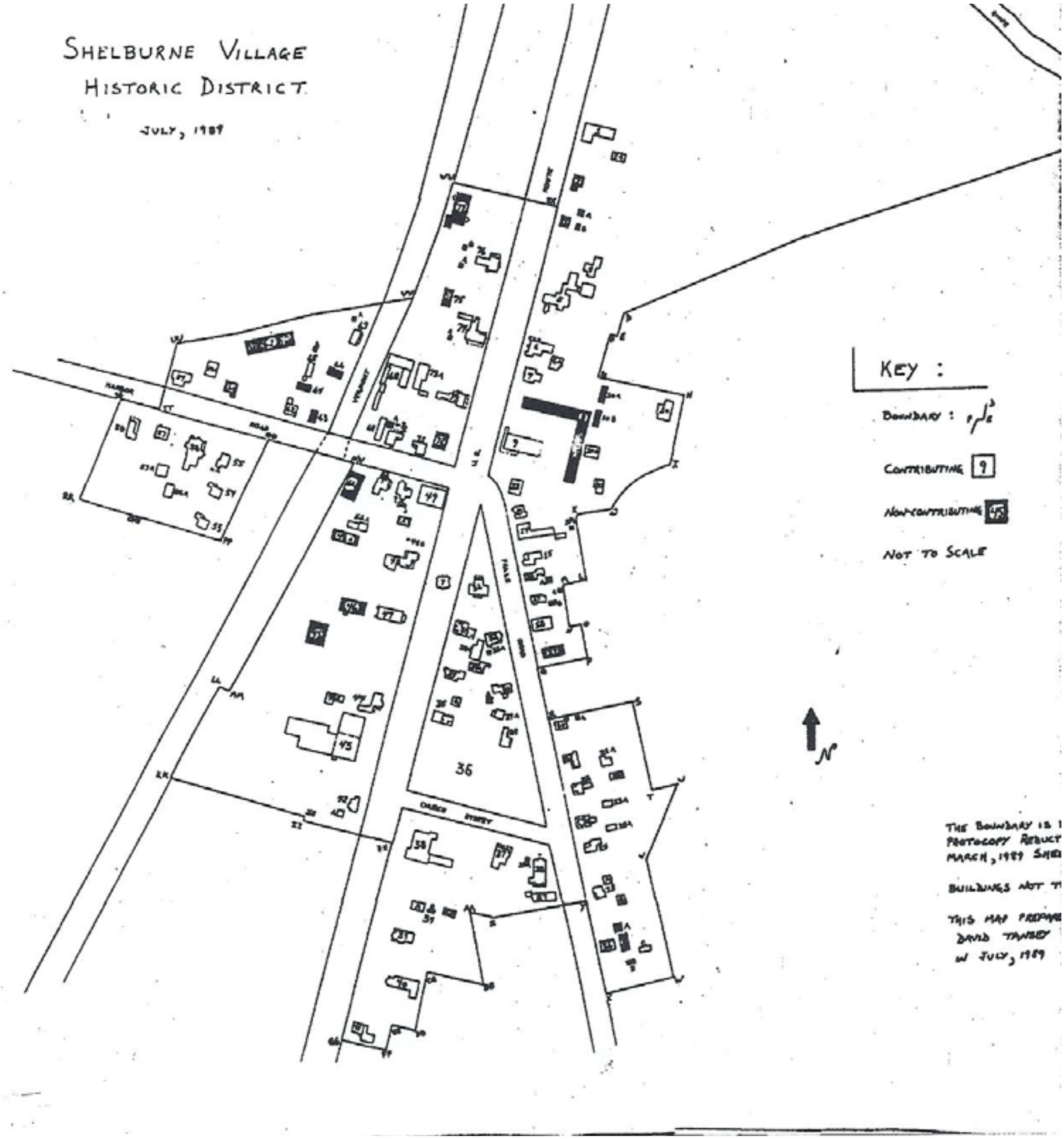
Section number 7 Page 93

station has been altered but is clearly recognizable as one of Teague's designs.

This is a one story rectangular block with a flat roof. The left front (SE) corner is occupied by the office which has modern replacement windows wrapping the corner. Three service bays with overhead doors are to the north. The walls are sheathed with porcelain-enameled metal. The "Texaco" sign and those signs over the service bays have been removed but the three parallel streamlines which run horizontally across the parapet remain.

Extending from the northwest corner is a one story, shed roofed addition built c.1988.

This station was constructed on this lot after the IGA store and Post Office formerly on the site was moved to the Shelburne Museum in 1952.


SHELBURNE VILLAGE
HISTORIC DISTRICT
JULY, 1989
KEY :
BOUNDARY :
CONTRIBUTING 9
NON-CONTRIBUTING 45
NOT TO SCALE
36

ARCHEOLOGICAL RESOURCE ASSESSMENT

Intersection of US7/ Falls Road/ Harbor Road Scoping Study

Town of Shelburne,
Chittenden County, Vermont

HAA # 4545.11

Submitted to:
Gregory Edwards, P.E.
Stantec
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An ACRA Member Firm
www.acra-crm.org

August 2012

ARCHEOLOGICAL RESOURCE ASSESSMENT

INTRODUCTION

Hartgen Archeological Associates, Inc. (HAA, Inc.) was retained by Stantec to conduct an Archaeological Resource Assessment (ARA) for the proposed Scoping Study of the US 7/ Falls Road/ Harbor Road Intersection located in the Town of Shelburne, Chittenden County, Vermont (Maps 1). The project is contracted by the Chittenden County Regional Planning Commission (CCRPC) and financially supported with Federal, State and Local funding. The project will be reviewed by VTrans.

The primary objective of the ARA is to identify areas of archeological sensitivity based on environmental factors, known site information and historical information for the project Area of Potential Effects (APE). Reference to the general project vicinity is provided as appropriate to understanding the local cultural and historical context. Background research was conducted at the Vermont Division for Historic Preservation (VDHP) where archaeological site files, National Register (NR), State Register (SR) and town information were reviewed. A site visit was conducted by Elise Manning Sterling on August 2, 2012 to observe and photograph existing conditions within the project area.

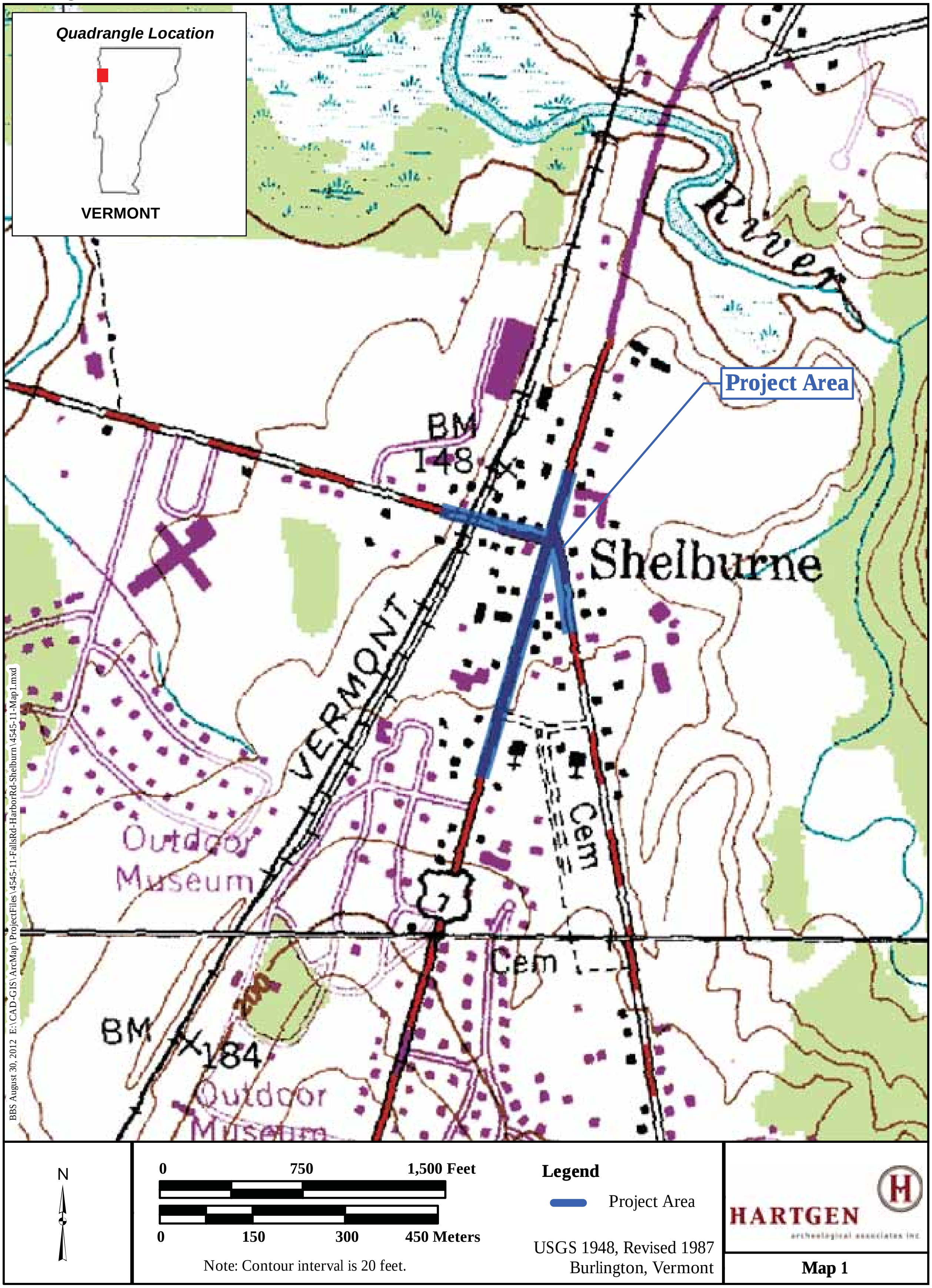
Environmental Overview and Current Conditions

Environmental characteristics of an area are significant for determining the sensitivity for archeological resources. Precontact and historic groups often favored level, well-drained locations near wetlands and waterways. Therefore, topography, proximity to wetlands, and soils are examined to determine if there are landforms in the project area that are more likely to contain archeological resources. In addition, bedrock formations or other lithic sources may contain resources that may have been quarried by precontact groups. Other locations can also be special purpose sacred and traditional use sites. Soil conditions can provide a clue to past climatic conditions, as well as changes in local hydrology.

The Village of Shelburne is located in the Vermont Lowlands physiographic region. It is located on a gently sloping terrace at an elevation of approximately 150 feet above mean sea level (amsl), situated above Lake Champlain and the La Platte River at elevations of approximately 100 amsl. The project area is located approximately 1,700 feet (517 m) south of the La Platte River and associated wetlands, and 1.35 miles (2.2 km) south of its confluence with Lake Champlain. The head of a drainage which flows into the La Platte River wetlands is located approximately 1,300 feet (395 m) to the south. The waterfalls of Shelburne Falls are located approximately 3840 feet (1.2 km) to the southeast. The Central Vermont Railroad is located at the western end of the project APE on Harbor Road

The project area encompasses the intersection of US 7, Harbor Road and Falls Road, and linear alignments along these three roads (Map 2). South of this intersection is a notable town green, triangular in shape, which is bordered by US 7 to the west, Falls Road to the east, and Church Street to the south (Photo 1). The project area is situated within the Shelburne Village National Register Historic District, and contains historic structures dating from 1796 to 1930, which represent a variety of architectural styles (Photo 2). The Shelburne Inn and the National Register Listed Lee Tracy House are located at the northern end of the APE, on opposite sides of US 7 (Photos 3 and 4). A modern gas station is located south of the Lee Tracy House and the Harbor Road/US 7 intersection. At the southern end of the project alignment, a 20th-century school/library and municipal complex is located on the western side of US 7. On the eastern side of US 7 south of Church Street, there sits the imposing stone United Methodist Church (Photo 5). Located further to the south, situated outside of the project APE on the west side of US 7 is the National Register Listed Shelburne Farms.

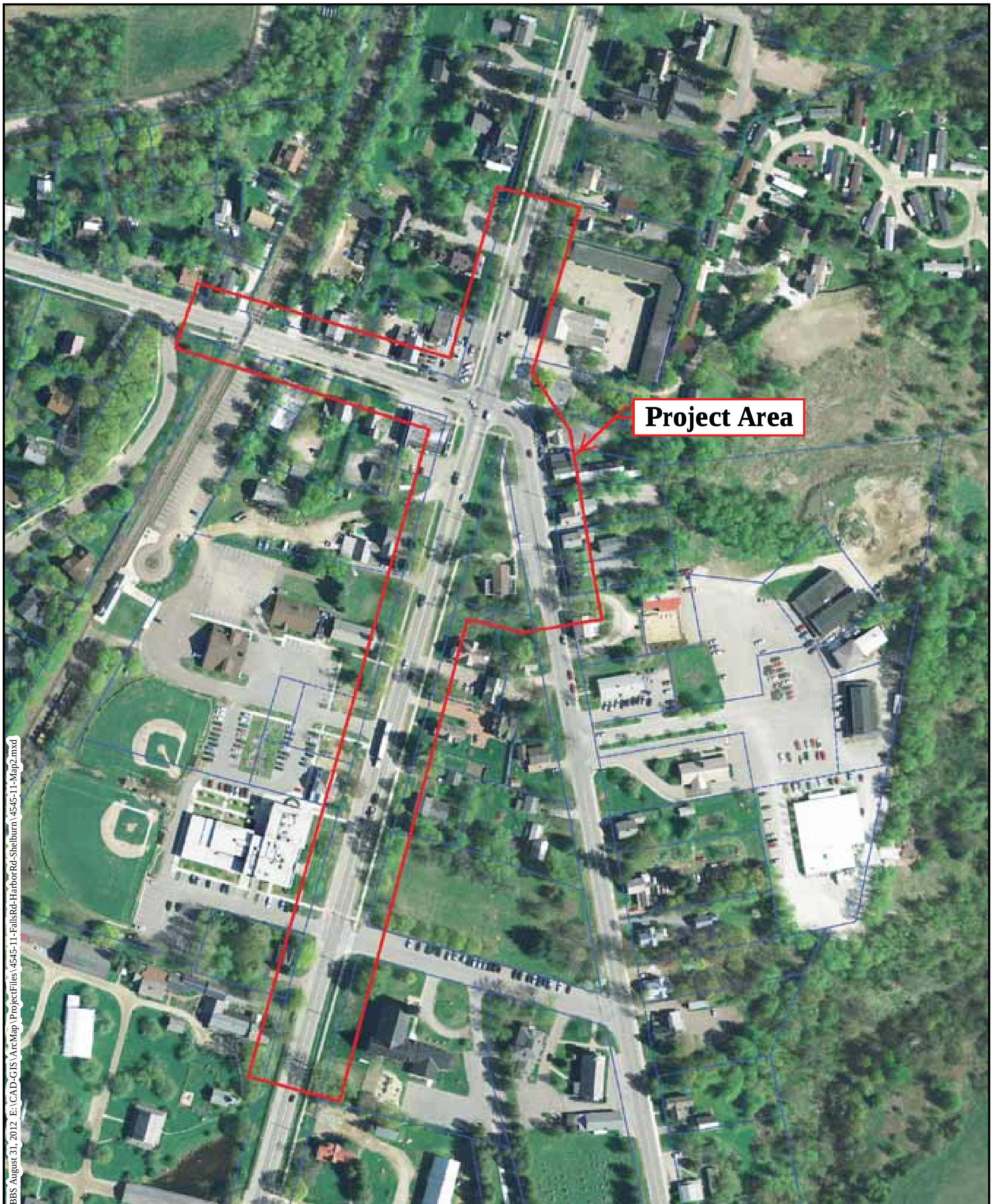
Along the three tree-lined streets within the project area, a number of the historic structures have been retained as domestic residences, while others presently house small businesses. Most of the APE contains sidewalks, which are either located directly adjacent to the roadway, or are separated from the road by grass



Note: Contour interval is 20 feet.

USGS 1948, Revised 1987
Burlington, Vermont

Map 1



N

0 250 500 Feet

0 50 100 150 Meters

Note: Graphic scale approximate.

Legend

Project Area

Shelburne Project Map
(Base Map Provided Stantec 2012)

HARTGEN
archeological associates inc

Map 2

Photo 1. Photo shows Falls Road looking northwest toward the US 7 intersection. The town green is on the left side of the road. Note the sidewalks directly adjacent to the roadway on the right.

strips of varying widths (See Photos 1-5). There are some areas adjacent to the roadways which contain water and gas lines, as indicated by fire hydrants and gas line signs, as well as drainage ditches and culverts (See Photos 3 and 5).

The primary soils types represented in the project area include Enosburg and Whately soils, 0 to 3 percent slopes (EwA), and Hinesburg fine sandy loam, 0 to 3 percent slopes (HnA). These soil types are located on level terrace landforms, and are somewhat excessively drained soils are derived from sandy glaciofluvial deposits, and are encountered on terrace formations between 90 to 1,200 feet amsl. The area at the southwestern edge of the project alignment, containing the school/library complex, is comprised of fill land (Fu) (USDA 2012).

Photo 2. Photo shows the historic district looking south on US 7. The town green is on the left.

Photo 3. Photo shows the Shelburne Inn and the project area on US 7 north of the Harbor Road/Falls Road intersection. View is to the north.

Photo 4. Photo shows the National Register Listed Lee Tracy House.
View is to the northwest.

Photo 5. Photo shows the United Methodist Church at the southern end of the project area. Note the drainage ditch and slope between the roadway and the sidewalk.

DOCUMENTARY RESEARCH

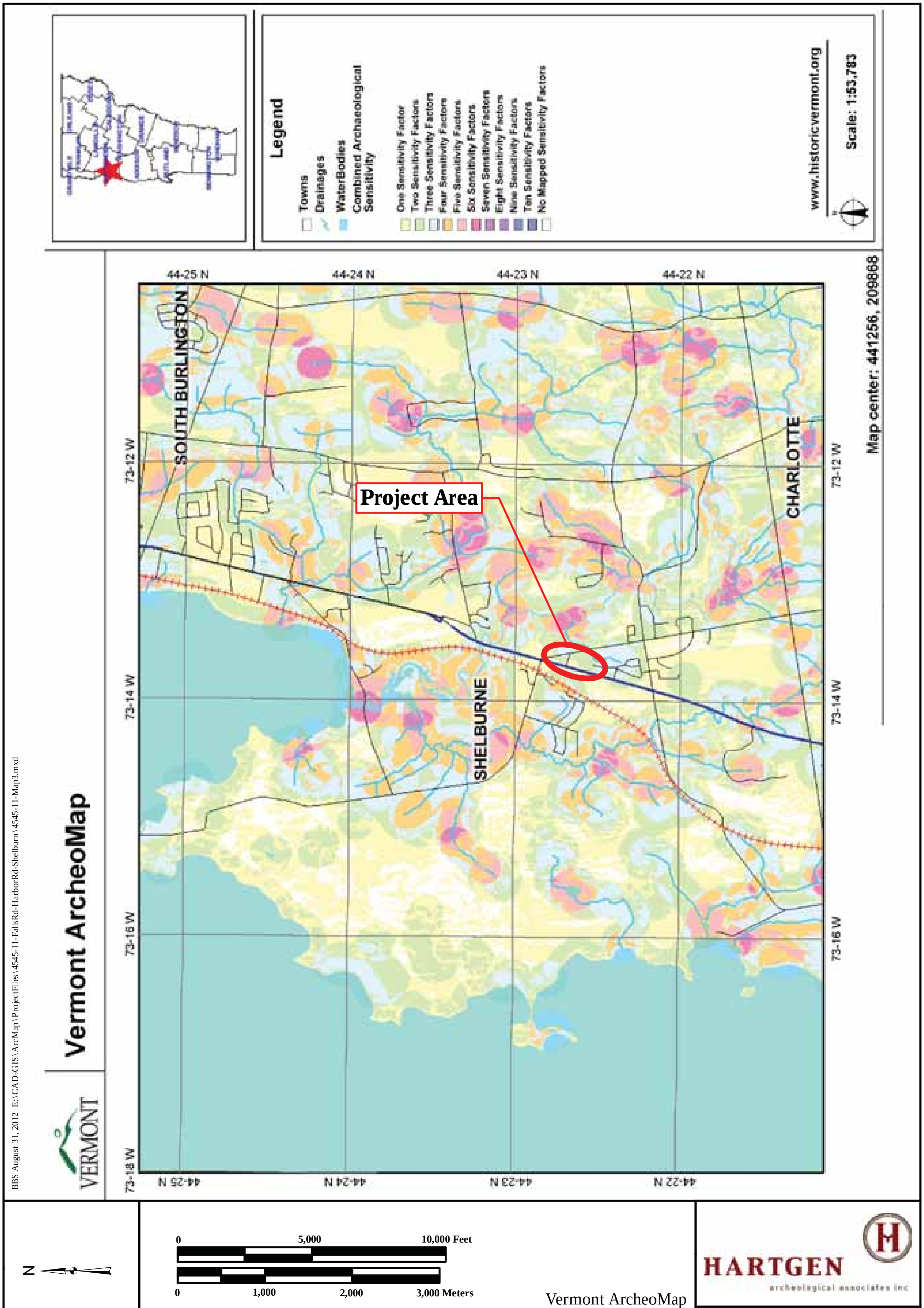
Precontact Site File Research and Archeological Sensitivity

Examination of VDHP site files indicates that there are seven precontact sites located within a one mile (1.6 km) radius of the APE. Several hundred other precontact sites are located within several miles of the project area, situated adjacent to Lake Champlain, the Winooski River, the La Platte River, and their numerous tributaries and associated wetlands. Six of the seven precontact sites located within one mile of the APE are located adjacent to the La Platte River and/or its associated marsh and wetlands, including: VT-CH-14 (La Platte Delta Site), VT-CH-155, VT-CH-156, VT-CH-322, VT-CH-366 and VT-CH-371 (La Platte River Marsh Site). The closest of these sites to the project area is located approximately 2,300 feet (700 m) to the north. The seventh site, VT-CH-221, which contained a quartzite Meadowood projectile point recovered in a garden, is located south of Harbor Road, situated approximately 650 feet (200 m) west of the project area.

The Vermont Division for Historic Preservation Internet Mapping Site was accessed and used to formulate the archaeological sensitivity of the proposed project area (VDHP 2009). The mapping site evaluates the precontact potential of all areas of Vermont, based on 11 environmental factors, such as the presence of specific terrain, soils, or proximity to streams or wetlands. If an area possesses just one of these environmental characteristics, it is considered by the Vermont Division for Historic Preservation (VDHP) / State Historic Preservation Officer (SHPO) to be archeologically sensitive. Based on the Vermont ArcheoMap Information System (VAMIS), the entire project area possesses three sensitivity factors, including its location on a glacial outwash terrace near a permanent stream, and the presence of level terrain. The southern end of the project APE possesses the additional sensitivity factor of proximity to the head of a drainage (Map 3).

The VDHP Environmental Predictive Model was completed for the project area which produced an overall rating of 24 (Appendix 1), with a rating of 32 or above indicating precontact sensitivity. The project area received points based on its location within a travel corridor, situated on a level terrace near the La Platte River and wetlands. The rating of this project area is somewhat problematic. The project area received 32 additional points based on the high density of precontact sites in the area, although most of the sites were situated in different environmental settings than that of the APE. These points were negated by the loss of 32 points for previous disturbance from the construction of roads, sidewalks, drainage ditches, utility lines and parking areas.

The general project area is considered to be an area of moderate precontact sensitivity. It is possible that precontact sites are present in undisturbed areas exhibiting level terrain. Areas directly adjacent to the roadway are considered to be disturbed from the construction of roads, sidewalks, driveways, drainage ditches and utility lines. The areas which may contain undisturbed soil stratigraphy are level areas of green space, including the grass lawns associated with the historic houses located within the Shelburne Village Historic District. If the proposed project plans involve impacts beyond the limits of the sidewalk onto level grass areas, then further archeological investigation is recommended.



Vermont ArcheoMap
(VDHP 2012)

Map 3

Historic Site File Search and Archeological Sensitivity

National Register

There is one historic district and one structure listed on the National Register located within the project APE (Map 3). These include:

- Lee Tracy House c. 1875 Victorian Italianate with Gothic Revival elements.
- Shelburne Village Historic District c. 1796 to 1930.

The National Register Listed Shelburne Farms complex is located directly south of the project area.

Cemeteries

There are no known cemeteries located within the project area. The St. Catherine's cemetery, established in 1890, is located south of St. Catherine's church located at the eastern end of Church Street (Hyde and Hyde 1991).

Historic Sites

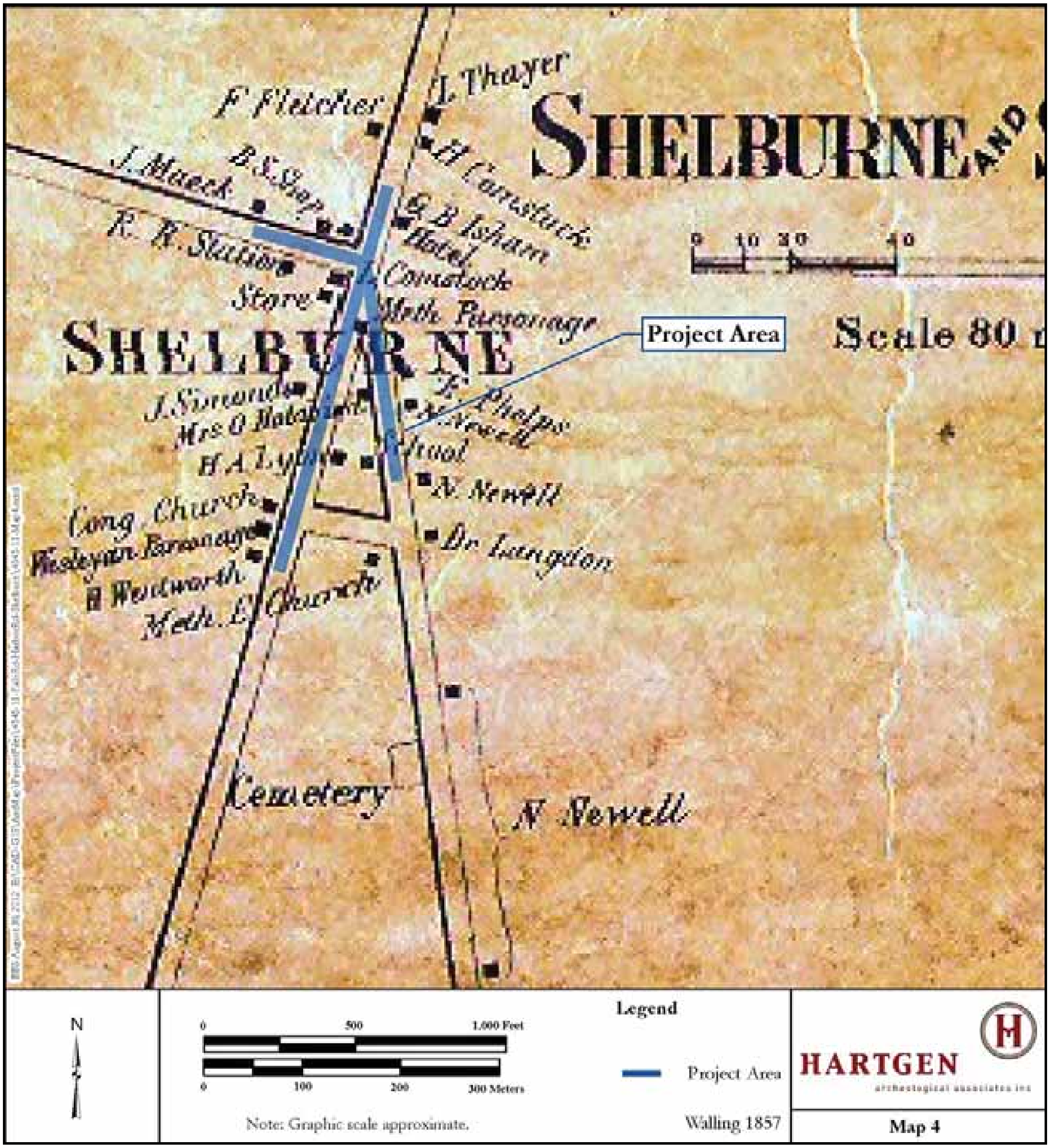
An examination of the VDHP archeological site files indicated that there is one historic archaeological site located within one mile of the project area. A large 19th-century mill and dam complex is located on the west side of the La Platte River in Shelburne Falls.

Historic Maps

A review of historic maps of the project area was conducted to attain an overview of the changing historical and environmental landscape within the project area. This review includes the study of historic structures that may be or may no longer be extant, alterations to road and rail systems, and changes in stream and river courses. The two 19th-century maps, the 1857 Walling map and the 1869 Beers map, depict the roadways and river and stream courses in the project area, as well as the names of the residents who lived there in those years (Maps 4 & 5).

The 1857 Walling map portrays Shelburne as a small settlement focused around the town green and the intersection of the three primary roads – present day US 7, Harbor Road and Falls Road. This map depicts a variety of structures located with the project area, including the G. B. Isham Hotel, a Congregational Church, the Wesleyan Parsonage, the Methodist parsonage, a school, a store, a blacksmith shop and seven domestic residences. This map also shows the presence of a railroad station, in preparation for the soon to be constructed railroad. The 1869 Beers suggests that there were few major changes to the village in the preceding decade, other than the construction of the Rutland and Burlington Railroad, and the establishment of the Town Hall.

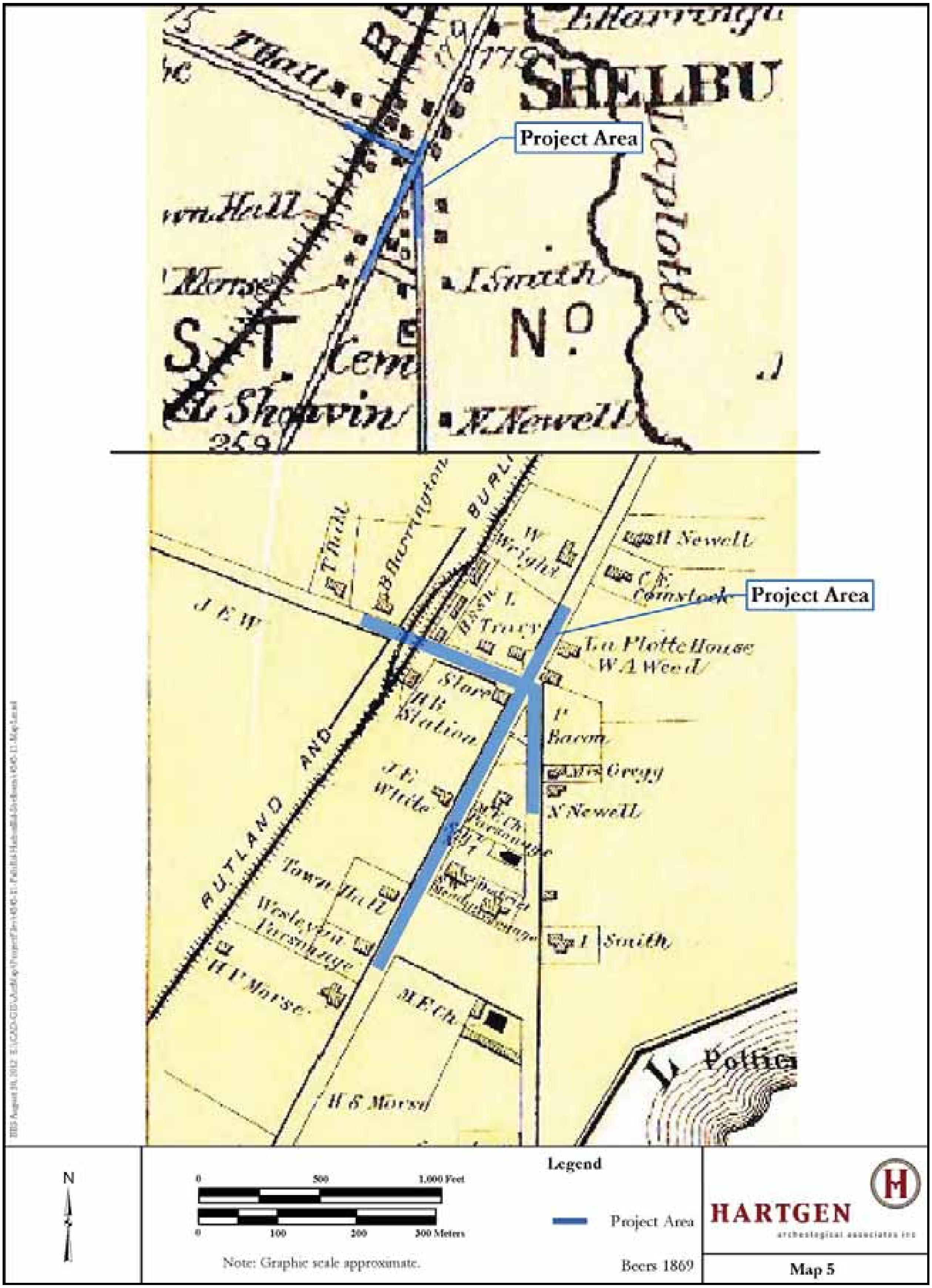
The primary historical development within the project area is the construction of houses and associated driveways and utilities along the three major roadways. It is unlikely that significant historic deposits or features would be located in the front yards of houses situated on such prominent thoroughfares. Therefore, the project area is considered to have a low sensitivity for historical cultural resources.



Note: Graphic scale approximate.

Walling 1857

Map 4


Project Area
SHELBU
I. Smith
N°
Cem
N. Newell
Project Area
BURLINGTON
RUTLAND AND
J E W
W Wright
C. R. Comstock
L. Tracy
La Plotte House
W A Weed
Store
R R Station
P. Bacon
Gregg
N Newell
J. E. White
Town Hall
Wesleyan Parsonage
H P Morse
M E Ch
I Smith
H S Morse
N
0
500
1,000 Feet
0
100
200
300 Meters
Note: Graphic scale approximate.
Legend
Project Area
Beers 1869
HARTGEN
archeological associates inc
Map 5

ARCHEOLOGICAL POTENTIAL AND RECOMMENDATIONS

A site visit was made to the Shelburne project area on August 3, 2012 under sunny and warm conditions. Sidewalks are present throughout most of the project area alignment. Areas directly adjacent to the roadway are considered to be disturbed from the construction of roads, sidewalks, driveways, drainage ditches and utility lines. As discussed in the precontact section of this report, the areas which are considered archeologically sensitive are undisturbed areas of level terrain. Within the project area, these sensitivity areas include lawn and grass parcels located beyond the sidewalks. If the project plans entail ground disturbance beyond the limits of the sidewalks onto level lawns and green spaces, then further archeological investigation is recommended.

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APPENDIX 1: VDHP Archaeological Resources Assessment Form

Vermont Division for Historic Preservation
Archeological Resources Assessment Form
US7/Harbor Road/Falls Road, Shelburne, VT

DHP#
Organization & Recorder: **HAA. INC./ E. Manning**
Date: 8/29/2012

Envronmental Predictive Model				ArcheoMapTool GIS Model	Field Inspection Comments
Variable	Proximity	Value	Assigned Score	Variable	
A. Rivers and Streams (Existing or relict)					
1) Proximity to Rivers and Permanent Streams	0–90 m	12		Layer 1: Proximity to Rivers and Permanent Streams (0-180 m)	
	90-180 m	6			
2) Proximity to Intermittent Streams	0–90 m	12		-	
	90-180 m	6			
3) Proximity to Permanent River/Stream Confluences	0–90 m	8		Layer 6: Proximity to River/Stream Confluences (0-180 m)	
	90-180 m	4			
4) Proximity to Intermittent Stream Confluences	0–90 m	12		-	
	90-180 m	6			
5) Proximity to Waterfalls	0–90 m	8		Layer 7: Proximity to Waterfalls (0-180 m)	
	90-180 m	4			
6) Proximity to Heads of Drainages	0–90 m	8		Layer 5: Proximity to Heads of Permanent Drainages (0-300 m)	
	90-180 m	4			
7) Major Floodplain - Alluvial Terrace	0–90 m	8		Layer 10: Floodplain Soils Presence	
	90-180 m	4			
8) Knoll or Swamp Island		32		Layer 1: Proximity to Rivers and Permanent Streams (0-180 m)	
9) Stable Riverine Island		32		Layer 2: Proximity to Waterbodies (0-180 m)	
B. Lakes and Ponds					
10) Proximity to Pond or Lake	0–90 m	12		Layer 2: Proximity to Waterbodies (0-180 m)	
	90-180 m	6			
11) Proximity to Stream-Waterbody Confluences	0–90 m	12		Layer 4: Proximity to Stream-Waterbody Confluences (0-180 m)	
	90-180 m	6			
12) Lake Coves, Peninsulas, and Bayheads	0–90 m	12		Layer 2: Proximity to Waterbodies (0-180 m)	
	90-180 m	6			
C. Wetlands					
13) Proximity to Wetlands*	0–90 m	12		Layer 3: Proximity to Wetlands (0-180 m)	
	90-180 m	6			

Envronmental Predictive Model				ArcheoMapTool GIS Model	Field Inspection Comments
Variable	Proximity	Value	Assigned Score	Variable	
14) Knoll or Swamp Island		32		Layer 3: Proximity to Wetlands (0-180 m)	
D) Valley edge and Glacial Landforms					
15) High Elevated Landform (e.g. Knoll Top, Ridge Crest, Promontory)		12		See Landmarks (Info Layers) and Catchment layers (Water-related Layers)	
16) Valley Edge Features (e.g. Kame Outwash Terrace)		12	**12**	Layer 9 Glacial Outwash and Kame Terrace Soils	
17) Marine/Lake Delta Complexes		12		Layer 9 Glacial Outwash and Kame Terrace Soils Presence	
18) Champlain Sea or Glacial Lake Shore Line**		12		Layer 8: Paleo Lake Soils Proximity (0-180 m)	
E. Other Environmental Factors					
19) Caves and Rockshelters		32		-	
20) Natural Travel Corridors (e.g. Drainage Divides)		12	**12**	See Landmarks (Info Layers) and catchment layers (Water-related Layers)	
21) Existing or Relict Springs	0–90 m	8		-	
	90–180 m	4			
22) Potential or Apparent Prehistoric Quarry for Lithic Material Procurement	0–90 m	8		See Soils with "M" parent material (Under Construction)	
	90–180 m	4			
23) Special Environmental or Natural Area~	0–180 m	32		-	
F. Other High Sensitivity Layers					
24) High Likelihood of Burials		32		See VAI layer (Under Construction)	
25) High Recorded Archeological Site Density		32	**32**	See VAI layer (Under Construction)	
26) High likelihood of containing significant site based on recorded or archival data or oral tradition		32		See VAI layer (Under Construction)	

Envronmental Predictive Model				ArcheoMapTool GIS Model	Field Inspection Comments
Variable	Proximity	Value	Assigned Score	Variable	
G. Negative Factors					
27) Excessive (>15%) or Steep Erosional (>20%) Slopes		-32		See Slope Layer (Info Layers folder)	
28) Previously Disturbed Land***		-32	**-32**	See Land Use ND Building Footprint Layers (Info Layers folder)	
Total Score:			**24**		

** remains incompletely mapped; digital layer includes paleo lakes and wetlands based on soils data
*** as evaluated by a qualified archeological professional or engineer based on coring, earlier as-built plans, or obvious surface evidence (such as a gravel pit)
~such as Milton acquifer, mountain top, etc. (historic or prehistoric sacred or traditional site locations, other prehistoric site types)
*Environmental predictive model limits wetlands to those > one acre in size; ArchSensMap

Edwards, Greg

From:	Newman, Scott <Scott.Newman@state.vt.us>
Sent:	Thursday, August 01, 2013 9:31 AM
To:	Edwards, Greg
Cc:	Schultz, Joshua; Lyman, Derek; Palmer, Spencer; Jason Charest (jcharest@ccrpcvt.org); Dean Pierce (dpierce@shelburnevt.org); pbohne@shelburnevt.org; Bryant, Richard; Zicconi, John; O'Shea, Kaitlin; Ramsey, Jeff; O'Shea, Kaitlin
Subject:	RE: Shelburne US 7/Harbor Road/Fall Rd

Thanks for the illustration, Greg. The roundabout option provided has Section 106 and Section 4(f) impacts that preclude it being advanced as an alternative in this project, as follows:

The Section 106 finding for the roundabout would be *Adverse Effect* due to the loss/conversion of significant green space within the historic district to transportation use. Section 106 would require that stakeholders consult to evaluate avoidance alternatives, and would ultimately support the intersection modification plan generated through our consultation on-site that avoids an adverse effect.

Section 4(f) would require that we evaluate alternatives to the conversion of protected property resulting from the roundabout construction, therein demonstrate that no prudent and feasible alternatives to avoid the adverse effect exist, and finally, require that we advance the least harm alternative that meets the project purpose and need. Because modifying the intersection and using ITS appears to be a prudent and feasible alternative that avoids adverse effects while meeting the project purpose and need, the roundabout option that you provided could not be advanced.

Thanks for the opportunity to meet on site and comment on the alternatives. If you have any questions please let me know.

Scott

D. Scott Newman M.Sc.
Historic Preservation Officer
Vermont Agency of Transportation
802.595.5119

From: Edwards, Greg [mailto:greg.edwards@stantec.com]
Sent: Wednesday, July 31, 2013 3:02 PM
To: Newman, Scott
Cc: Schultz, Joshua; Lyman, Derek; Palmer, Spencer; Jason Charest (jcharest@ccrpcvt.org); Dean Pierce (dpierce@shelburnevt.org); pbohne@shelburnevt.org; Bryant, Richard; Zicconi, John; O'Shea, Kaitlin
Subject: RE: Shelburne US 7/Harbor Road/Fall Rd

Hi Scott,

Attached is a graphic of a single lane roundabout at the subject intersection. It is depicted at a very minimal diameter to minimize impacts. Ideally it would larger and traffic capacity analyzes suggest a 2 lane roundabout is needed.

As we discussed, can you provide an opinion regarding this alternative and its impact on historic resources? We also adjusting the Harbor Road approach design as we discussed in the field and will forward that for your review as well. Appreciate your input and guidance on this project.

Greg Edwards
Principal, Transportation
Stantec
55 Green Mountain Drive
South Burlington VT 05403
Ph: (802) 864-0223 ext 103
Fx: (802) 864-0165
Cell: (603) 289-0025
greg.edwards@stantec.com
stantec.com

From: Edwards, Greg
Sent: Wednesday, July 24, 2013 3:12 PM
To: 'Newman, Scott'; Schultz, Joshua; Lyman, Derek; Palmer, Spencer; Jason Charest (jcharest@ccrpcvt.org); Dean Pierce (dpierce@shelburnevt.org); pbohne@shelburnevt.org; Bryant, Richard; Zicconi, John; O'Shea, Kaitlin
Subject: RE: Shelburne US 7/Harbor Road/Fall Rd

Attached are draft meeting notes from today's meeting. Welcome any comments.

Greg Edwards
Principal, Transportation
Stantec
55 Green Mountain Drive
South Burlington VT 05403
Ph: (802) 864-0223 ext 103
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Please consider the environment before printing this email.

From: Newman, Scott [mailto:Scott.Newman@state.vt.us]
Sent: Friday, July 12, 2013 8:34 AM
To: Edwards, Greg
Cc: Schultz, Joshua; Lyman, Derek; Palmer, Spencer; Jason Charest (jcharest@ccrpcvt.org); Dean Pierce (dpierce@shelburnevt.org); pbohne@shelburnevt.org; Bryant, Richard; Zicconi, John; O'Shea, Kaitlin
Subject: Re: Shelburne US 7/Harbor Road/Fall Rd

Thanks for the prompt, Greg. 10 AM on the 24th or 25th will work on-site. If the green arrow is working (preferable), let's meet there at 8 AM on either day - your call.

Thanks,
Scott

D. Scott Newman
Historic Preservation Officer
Vermont Agency of Transportation

APPENDIX E

Archaeological Resources

ARCHEOLOGICAL RESOURCE ASSESSMENT

Intersection of US7/ Falls Road/ Harbor Road Scoping Study

Town of Shelburne,
Chittenden County, Vermont

HAA # 4545.11

Submitted to:
Gregory Edwards, P.E.
Stantec
55 Green Mountain Drive
South Burlington, Vermont 05403
p. 802.864.0223
c. 603.289.0025
greg.edwards@stantec.com

Prepared by:
Hartgen Archeological Associates, Inc.
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www.hartgen.com

An ACRA Member Firm
www.acra-crm.org

August 2012

ARCHEOLOGICAL RESOURCE ASSESSMENT

INTRODUCTION

Hartgen Archeological Associates, Inc. (HAA, Inc.) was retained by Stantec to conduct an Archaeological Resource Assessment (ARA) for the proposed Scoping Study of the US 7/ Falls Road/ Harbor Road Intersection located in the Town of Shelburne, Chittenden County, Vermont (Maps 1). The project is contracted by the Chittenden County Regional Planning Commission (CCRPC) and financially supported with Federal, State and Local funding. The project will be reviewed by VTrans.

The primary objective of the ARA is to identify areas of archeological sensitivity based on environmental factors, known site information and historical information for the project Area of Potential Effects (APE). Reference to the general project vicinity is provided as appropriate to understanding the local cultural and historical context. Background research was conducted at the Vermont Division for Historic Preservation (VDHP) where archaeological site files, National Register (NR), State Register (SR) and town information were reviewed. A site visit was conducted by Elise Manning Sterling on August 2, 2012 to observe and photograph existing conditions within the project area.

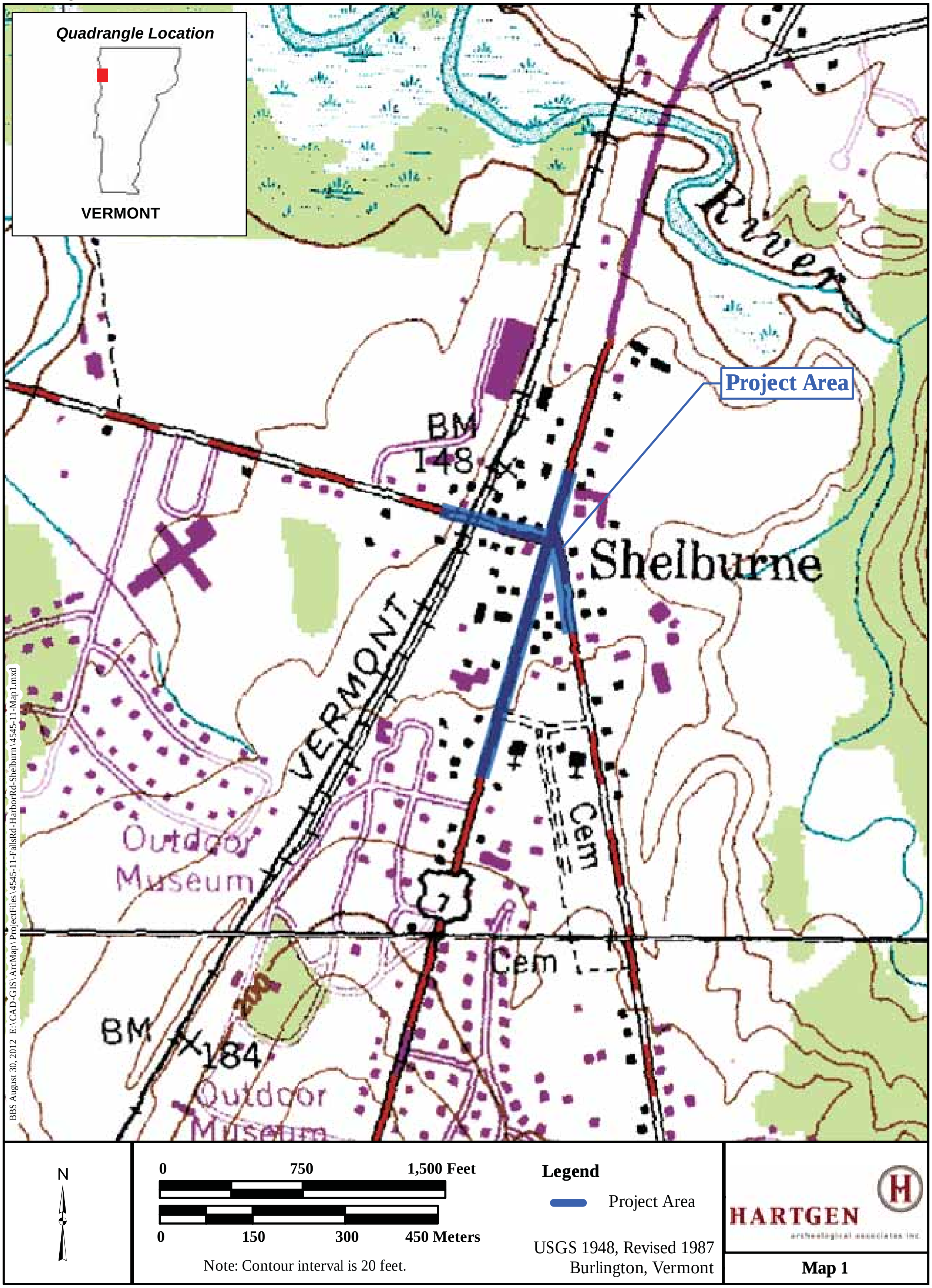
Environmental Overview and Current Conditions

Environmental characteristics of an area are significant for determining the sensitivity for archeological resources. Precontact and historic groups often favored level, well-drained locations near wetlands and waterways. Therefore, topography, proximity to wetlands, and soils are examined to determine if there are landforms in the project area that are more likely to contain archeological resources. In addition, bedrock formations or other lithic sources may contain resources that may have been quarried by precontact groups. Other locations can also be special purpose sacred and traditional use sites. Soil conditions can provide a clue to past climatic conditions, as well as changes in local hydrology.

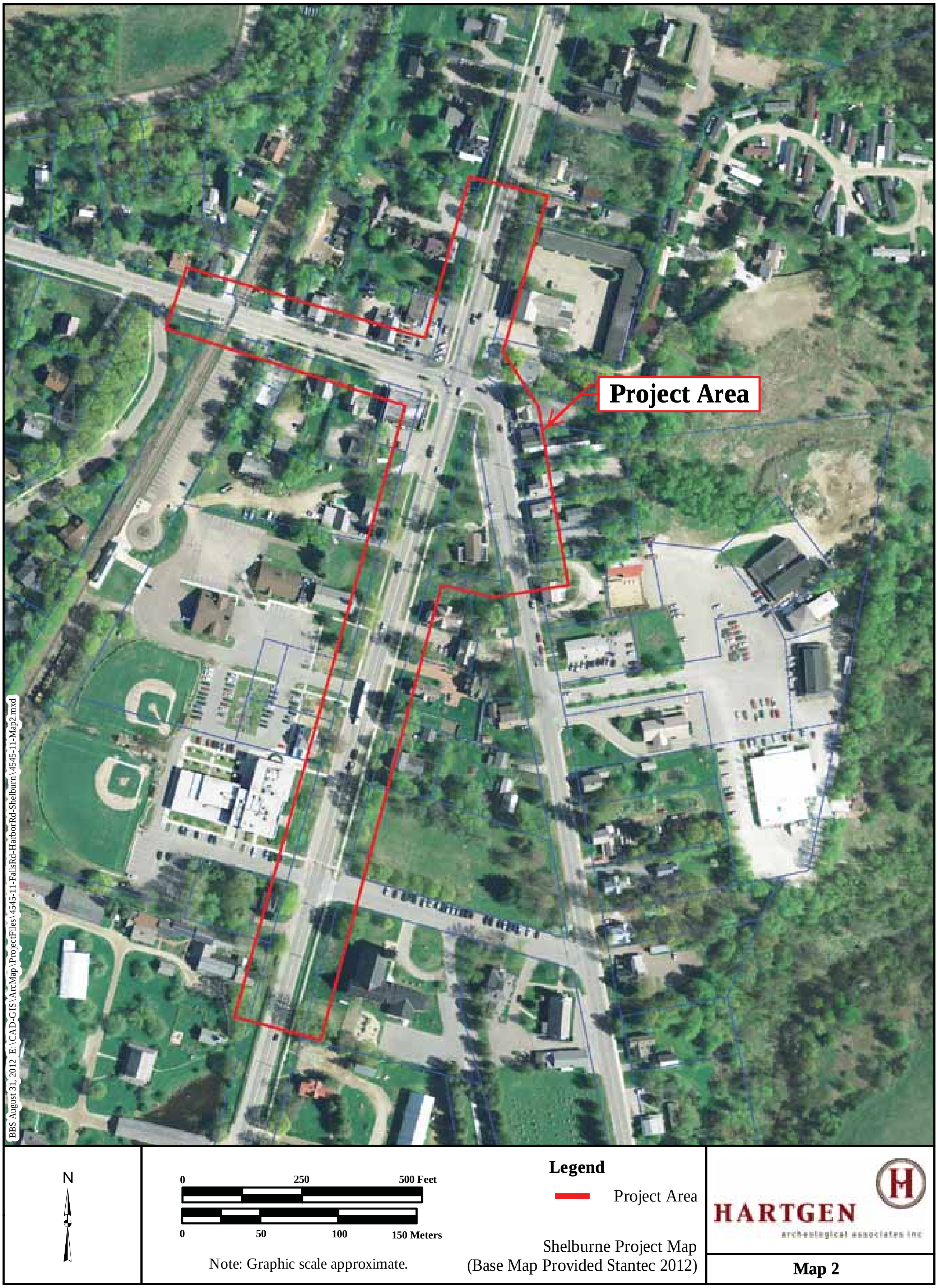
The Village of Shelburne is located in the Vermont Lowlands physiographic region. It is located on a gently sloping terrace at an elevation of approximately 150 feet above mean sea level (amsl), situated above Lake Champlain and the La Platte River at elevations of approximately 100 amsl. The project area is located approximately 1,700 feet (517 m) south of the La Platte River and associated wetlands, and 1.35 miles (2.2 km) south of its confluence with Lake Champlain. The head of a drainage which flows into the La Platte River wetlands is located approximately 1,300 feet (395 m) to the south. The waterfalls of Shelburne Falls are located approximately 3840 feet (1.2 km) to the southeast. The Central Vermont Railroad is located at the western end of the project APE on Harbor Road

The project area encompasses the intersection of US 7, Harbor Road and Falls Road, and linear alignments along these three roads (Map 2). South of this intersection is a notable town green, triangular in shape, which is bordered by US 7 to the west, Falls Road to the east, and Church Street to the south (Photo 1). The project area is situated within the Shelburne Village National Register Historic District, and contains historic structures dating from 1796 to 1930, which represent a variety of architectural styles (Photo 2). The Shelburne Inn and the National Register Listed Lee Tracy House are located at the northern end of the APE, on opposite sides of US 7 (Photos 3 and 4). A modern gas station is located south of the Lee Tracy House and the Harbor Road/US 7 intersection. At the southern end of the project alignment, a 20th-century school/library and municipal complex is located on the western side of US 7. On the eastern side of US 7 south of Church Street, there sits the imposing stone United Methodist Church (Photo 5). Located further to the south, situated outside of the project APE on the west side of US 7 is the National Register Listed Shelburne Farms.

Along the three tree-lined streets within the project area, a number of the historic structures have been retained as domestic residences, while others presently house small businesses. Most of the APE contains sidewalks, which are either located directly adjacent to the roadway, or are separated from the road by grass


Quadrangle Location
VERMONT
Project Area
River
Shelburne
BM
148
VERMONT
7
Cem
Cem
Outdoor
Museum
BM
184
Outdoor
Museum
BBS August 30, 2012 E:\CAD-GIS\ArcMap\ProjectFiles\4545-11-FallsRd-HarborRd-Shelburn\4545-11-Map1.mxd
N
0
750
1,500 Feet
0
150
300
450 Meters
Note: Contour interval is 20 feet.
Legend
Project Area
USGS 1948, Revised 1987
Burlington, Vermont
HARTGEN
archeological associates inc

Map 1


Project Area
BBS August 31, 2012 E:\CAD-GIS\ArcMap\ProjectFiles\4545-11-FallsRd-HarborRd-Shelburn\4545-11-Map2.mxd
N
0
250
500 Feet
0
50
100
150 Meters
Note: Graphic scale approximate.
Legend
Project Area
Shelburne Project Map
(Base Map Provided Stantec 2012)
HARTGEN
archeological associates inc

Map 2

Photo 1. Photo shows Falls Road looking northwest toward the US 7 intersection. The town green is on the left side of the road. Note the sidewalks directly adjacent to the roadway on the right.

strips of varying widths (See Photos 1-5). There are some areas adjacent to the roadways which contain water and gas lines, as indicated by fire hydrants and gas line signs, as well as drainage ditches and culverts (See Photos 3 and 5).

The primary soils types represented in the project area include Enosburg and Whately soils, 0 to 3 percent slopes (EwA), and Hinesburg fine sandy loam, 0 to 3 percent slopes (HnA). These soil types are located on level terrace landforms, and are somewhat excessively drained soils are derived from sandy glaciofluvial deposits, and are encountered on terrace formations between 90 to 1,200 feet amsl. The area at the southwestern edge of the project alignment, containing the school/library complex, is comprised of fill land (Fu) (USDA 2012).

Photo 2. Photo shows the historic district looking south on US 7. The town green is on the left.

Photo 3. Photo shows the Shelburne Inn and the project area on US 7 north of the Harbor Road/Falls Road intersection. View is to the north.

Photo 4. Photo shows the National Register Listed Lee Tracy House. View is to the northwest.

Photo 5. Photo shows the United Methodist Church at the southern end of the project area. Note the drainage ditch and slope between the roadway and the sidewalk.

DOCUMENTARY RESEARCH

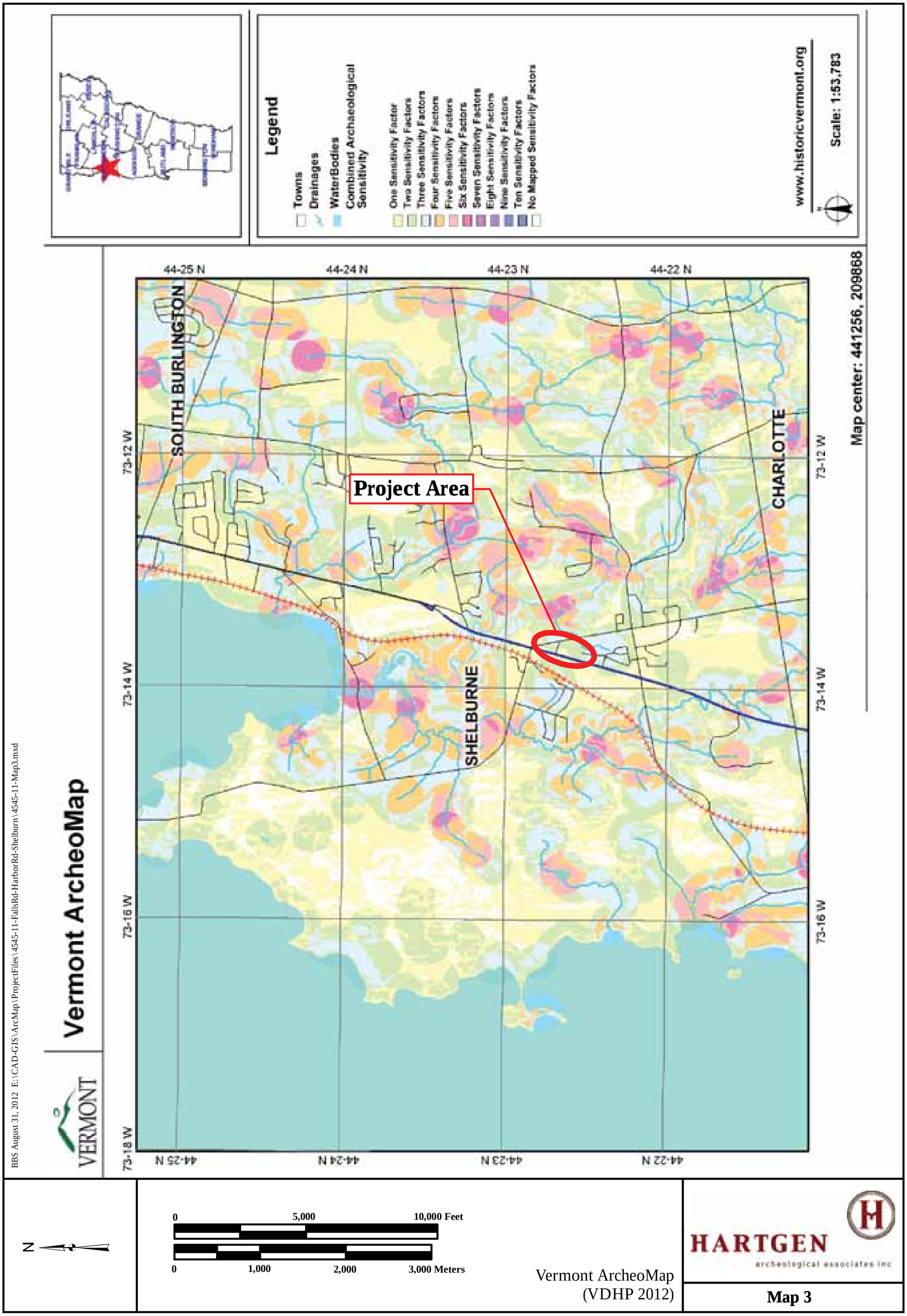
Precontact Site File Research and Archeological Sensitivity

Examination of VDHP site files indicates that there are seven precontact sites located within a one mile (1.6 km) radius of the APE. Several hundred other precontact sites are located within several miles of the project area, situated adjacent to Lake Champlain, the Winooski River, the La Platte River, and their numerous tributaries and associated wetlands. Six of the seven precontact sites located within one mile of the APE are located adjacent to the La Platte River and/or its associated marsh and wetlands, including: VT-CH-14 (La Platte Delta Site), VT-CH-155, VT-CH-156, VT-CH-322, VT-CH-366 and VT-CH-371 (La Platte River Marsh Site). The closest of these sites to the project area is located approximately 2,300 feet (700 m) to the north. The seventh site, VT-CH-221, which contained a quartzite Meadowood projectile point recovered in a garden, is located south of Harbor Road, situated approximately 650 feet (200 m) west of the project area.

The Vermont Division for Historic Preservation Internet Mapping Site was accessed and used to formulate the archaeological sensitivity of the proposed project area (VDHP 2009). The mapping site evaluates the precontact potential of all areas of Vermont, based on 11 environmental factors, such as the presence of specific terrain, soils, or proximity to streams or wetlands. If an area possesses just one of these environmental characteristics, it is considered by the Vermont Division for Historic Preservation (VDHP) / State Historic Preservation Officer (SHPO) to be archeologically sensitive. Based on the Vermont ArcheoMap Information System (VAMIS), the entire project area possesses three sensitivity factors, including its location on a glacial outwash terrace near a permanent stream, and the presence of level terrain. The southern end of the project APE possesses the additional sensitivity factor of proximity to the head of a drainage (Map 3).

The VDHP Environmental Predictive Model was completed for the project area which produced an overall rating of 24 (Appendix 1), with a rating of 32 or above indicating precontact sensitivity. The project area received points based on its location within a travel corridor, situated on a level terrace near the La Platte River and wetlands. The rating of this project area is somewhat problematic. The project area received 32 additional points based on the high density of precontact sites in the area, although most of the sites were situated in different environmental settings than that of the APE. These points were negated by the loss of 32 points for previous disturbance from the construction of roads, sidewalks, drainage ditches, utility lines and parking areas.

The general project area is considered to be an area of moderate precontact sensitivity. It is possible that precontact sites are present in undisturbed areas exhibiting level terrain. Areas directly adjacent to the roadway are considered to be disturbed from the construction of roads, sidewalks, driveways, drainage ditches and utility lines. The areas which may contain undisturbed soil stratigraphy are level areas of green space, including the grass lawns associated with the historic houses located within the Shelburne Village Historic District. If the proposed project plans involve impacts beyond the limits of the sidewalk onto level grass areas, then further archeological investigation is recommended.


Vermont ArcheoMap
Legend
Towns
Drainages
WaterBodies
Combined Archaeological Sensitivity
One Sensitivity Factor
Two Sensitivity Factors
Three Sensitivity Factors
Four Sensitivity Factors
Five Sensitivity Factors
Six Sensitivity Factors
Seven Sensitivity Factors
Eight Sensitivity Factors
Nine Sensitivity Factors
Ten Sensitivity Factors
No Mapped Sensitivity Factors
www.historicvermont.org
Scale: 1:53,783
Map center: 441256, 209868
Project Area
SOUTH BURLINGTON
SHELBURNE
CHARLOTTE
44-25 N
44-24 N
44-23 N
44-22 N
73-12 W
73-14 W
73-16 W
73-18 W
BBS August 31, 2012 E:\CAD-GIS\ArcMap ProjectFiles\4545-11-FallsRd-HarborRd-Shelburn\4545-11-Map3.mxd
VERMONT
N
0
5,000
10,000 Feet
0
1,000
2,000
3,000 Meters
Vermont ArcheoMap
(VDHP 2012)
HARTGEN
archeological associates inc
Map 3

Historic Site File Search and Archeological Sensitivity

National Register

There is one historic district and one structure listed on the National Register located within the project APE (Map 3). These include:

- Lee Tracy House c. 1875 Victorian Italianate with Gothic Revival elements.
- Shelburne Village Historic District c. 1796 to 1930.

The National Register Listed Shelburne Farms complex is located directly south of the project area.

Cemeteries

There are no known cemeteries located within the project area. The St. Catherine's cemetery, established in 1890, is located south of St. Catherine's church located at the eastern end of Church Street (Hyde and Hyde 1991).

Historic Sites

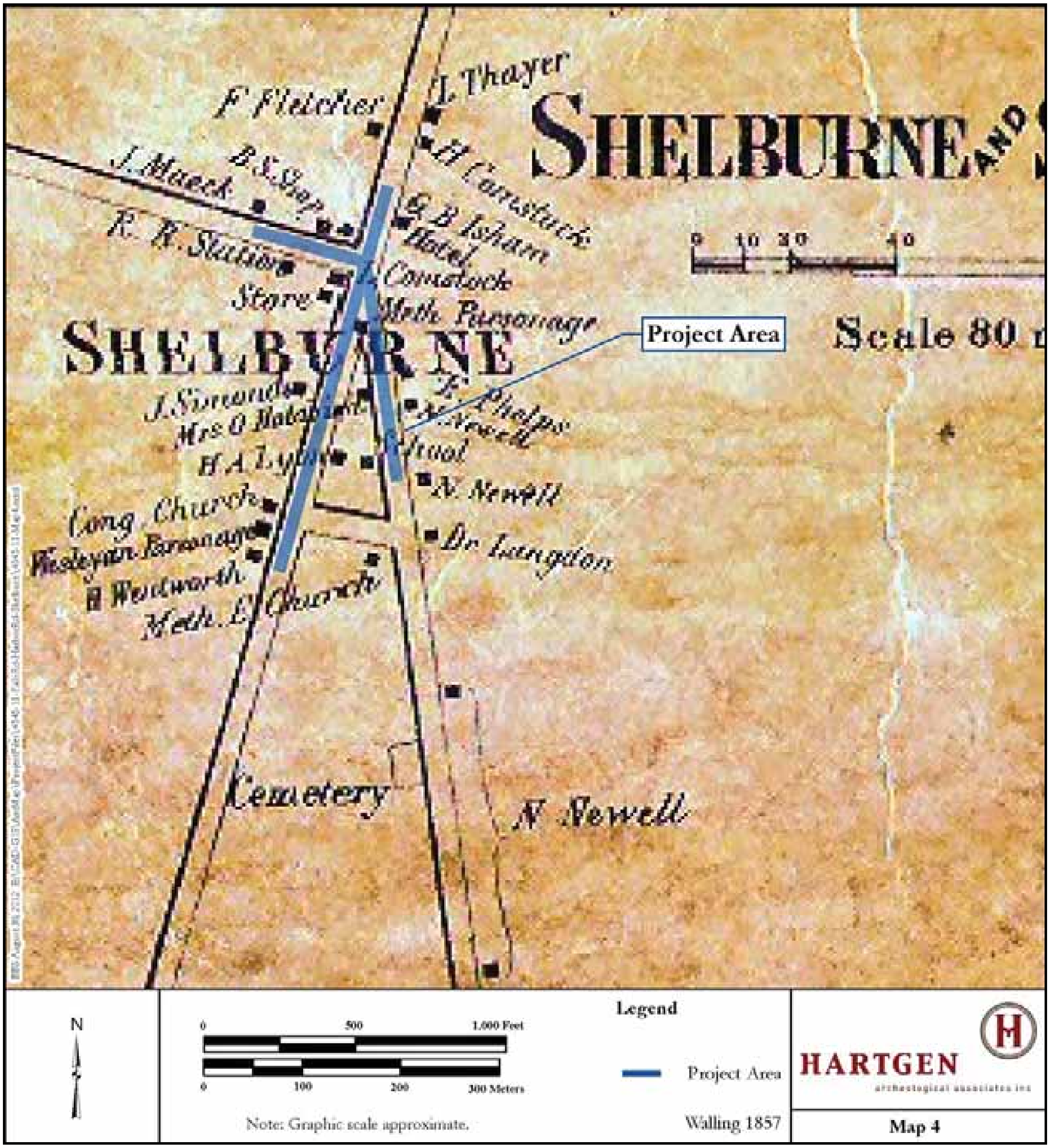
An examination of the VDHP archeological site files indicated that there is one historic archaeological site located within one mile of the project area. A large 19th-century mill and dam complex is located on the west side of the La Platte River in Shelburne Falls.

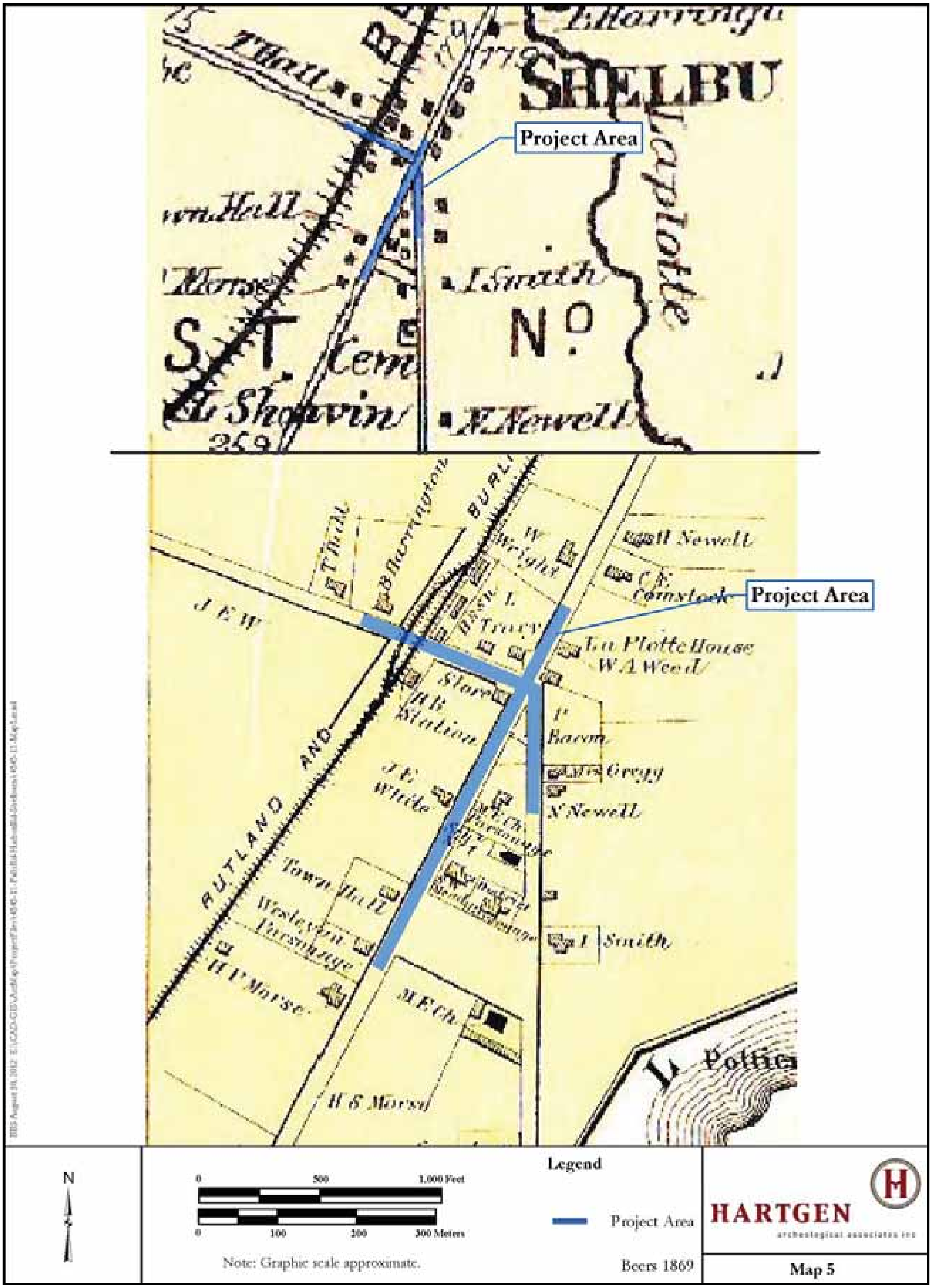
Historic Maps

A review of historic maps of the project area was conducted to attain an overview of the changing historical and environmental landscape within the project area. This review includes the study of historic structures that may be or may no longer be extant, alterations to road and rail systems, and changes in stream and river courses. The two 19th-century maps, the 1857 Walling map and the 1869 Beers map, depict the roadways and river and stream courses in the project area, as well as the names of the residents who lived there in those years (Maps 4 & 5).

The 1857 Walling map portrays Shelburne as a small settlement focused around the town green and the intersection of the three primary roads – present day US 7, Harbor Road and Falls Road. This map depicts a variety of structures located with the project area, including the G. B. Isham Hotel, a Congregational Church, the Wesleyan Parsonage, the Methodist parsonage, a school, a store, a blacksmith shop and seven domestic residences. This map also shows the presence of a railroad station, in preparation for the soon to be constructed railroad. The 1869 Beers suggests that there were few major changes to the village in the preceding decade, other than the construction of the Rutland and Burlington Railroad, and the establishment of the Town Hall.

The primary historical development within the project area is the construction of houses and associated driveways and utilities along the three major roadways. It is unlikely that significant historic deposits or features would be located in the front yards of houses situated on such prominent thoroughfares. Therefore, the project area is considered to have a low sensitivity for historical cultural resources.


SHELBURNE
Project Area
Scale 80
F Fletcher
J. Thayer
J. Mueck
B.S. Shop
R. R. Station
G. B. Isham
Hotel
Comstock
Store
Meth Parsonage
J. Simonds
Mrs O Holabird
H. A. Lyon
School
N. Newell
Cong Church
Wesleyan Parsonage
Dr Langdon
Wentworth
Meth. E. Church
Cemetery
N Newell
N
0
500
1,000 Feet
100
200
300 Meters
Note: Graphic scale approximate.
Legend
Project Area
Walling 1857
HARTGEN
archeological associates inc
Map 4


Project Area
Project Area
SHELBU
J. Smith
N. Newell
Cem
Wright
Newell
C. K. Comstock
La Plotte House
W A Weed
Tracy
Store
R R Station
Bacon
Gregg
N Newell
J. E. White
Town Hall
Wesleyan Parsonage
H P Morse
M E Ch
I Smith
H S Morse
RUTLAND AND BURLINGTON
N
0 500 1,000 Feet
0 100 200 300 Meters
Note: Graphic scale approximate.
Legend
Project Area
Beers 1869
HARTGEN
archeological associates inc
Map 5

ARCHEOLOGICAL POTENTIAL AND RECOMMENDATIONS

A site visit was made to the Shelburne project area on August 3, 2012 under sunny and warm conditions. Sidewalks are present throughout most of the project area alignment. Areas directly adjacent to the roadway are considered to be disturbed from the construction of roads, sidewalks, driveways, drainage ditches and utility lines. As discussed in the precontact section of this report, the areas which are considered archeologically sensitive are undisturbed areas of level terrain. Within the project area, these sensitivity areas include lawn and grass parcels located beyond the sidewalks. If the project plans entail ground disturbance beyond the limits of the sidewalks onto level lawns and green spaces, then further archeological investigation is recommended.

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APPENDIX 1: VDHP Archaeological Resources Assessment Form

Vermont Division for Historic Preservation
Archeological Resources Assessment Form
US7/Harbor Road/Falls Road, Shelburne, VT

DHP#
Organization & Recorder: **HAA. INC./ E. Manning**
Date: 8/29/2012

Envronmental Predictive Model				ArcheoMapTool GIS Model	Field Inspection Comments
Variable	Proximity	Value	Assigned Score	Variable	
A. Rivers and Streams (Existing or relict)					
1) Proximity to Rivers and Permanent Streams	0–90 m	12		Layer 1: Proximity to Rivers and Permanent Streams (0-180 m)	
	90-180 m	6			
2) Proximity to Intermittent Streams	0–90 m	12		-	
	90-180 m	6			
3) Proximity to Permanent River/Stream Confluences	0–90 m	8		Layer 6: Proximity to River/Stream Confluences (0-180 m)	
	90-180 m	4			
4) Proximity to Intermittent Stream Confluences	0–90 m	12		-	
	90-180 m	6			
5) Proximity to Waterfalls	0–90 m	8		Layer 7: Proximity to Waterfalls (0-180 m)	
	90-180 m	4			
6) Proximity to Heads of Drainages	0–90 m	8		Layer 5: Proximity to Heads of Permanent Drainages (0-300 m)	
	90-180 m	4			
7) Major Floodplain - Alluvial Terrace	0–90 m	8		Layer 10: Floodplain Soils Presence	
	90-180 m	4			
8) Knoll or Swamp Island		32		Layer 1: Proximity to Rivers and Permanent Streams (0-180 m)	
9) Stable Riverine Island		32		Layer 2: Proximity to Waterbodies (0-180 m)	
B. Lakes and Ponds					
10) Proximity to Pond or Lake	0–90 m	12		Layer 2: Proximity to Waterbodies (0-180 m)	
	90-180 m	6			
11) Proximity to Stream-Waterbody Confluences	0–90 m	12		Layer 4: Proximity to Stream-Waterbody Confluences (0-180 m)	
	90-180 m	6			
12) Lake Coves, Peninsulas, and Bayheads	0–90 m	12		Layer 2: Proximity to Waterbodies (0-180 m)	
	90-180 m	6			
C. Wetlands					
13) Proximity to Wetlands*	0–90 m	12		Layer 3: Proximity to Wetlands (0-180 m)	
	90-180 m	6			

Envronmental Predictive Model				ArcheoMapTool GIS Model	Field Inspection Comments
Variable	Proximity	Value	Assigned Score	Variable	
14) Knoll or Swamp Island		32		Layer 3: Proximity to Wetlands (0-180 m)	
D) Valley edge and Glacial Landforms					
15) High Elevated Landform (e.g. Knoll Top, Ridge Crest, Promontory)		12		See Landmarks (Info Layers) and Catchment layers (Water-related Layers)	
16) Valley Edge Features (e.g. Kame Outwash Terrace)		12	**12**	Layer 9 Glacial Outwash and Kame Terrace Soils	
17) Marine/Lake Delta Complexes		12		Layer 9 Glacial Outwash and Kame Terrace Soils Presence	
18) Champlain Sea or Glacial Lake Shore Line**		12		Layer 8: Paleo Lake Soils Proximity (0-180 m)	
E. Other Environmental Factors					
19) Caves and Rockshelters		32		-	
20) Natural Travel Corridors (e.g. Drainage Divides)		12	**12**	See Landmarks (Info Layers) and catchment layers (Water-related Layers)	
21) Existing or Relict Springs	0–90 m	8		-	
	90–180 m	4			
22) Potential or Apparent Prehistoric Quarry for Lithic Material Procurement	0–90 m	8		See Soils with "M" parent material (Under Construction)	
	90–180 m	4			
23) Special Environmental or Natural Area~	0–180 m	32		-	
F. Other High Sensitivity Layers					
24) High Likelihood of Burials		32		See VAI layer (Under Construction)	
25) High Recorded Archeological Site Density		32	**32**	See VAI layer (Under Construction)	
26) High likelihood of containing significant site based on recorded or archival data or oral tradition		32		See VAI layer (Under Construction)	

Envronmental Predictive Model				ArcheoMapTool GIS Model	Field Inspection Comments
Variable	Proximity	Value	Assigned Score	Variable	
G. Negative Factors					
27) Excessive (>15%) or Steep Erosional (>20%) Slopes		-32		See Slope Layer (Info Layers folder)	
28) Previously Disturbed Land***		-32	**-32**	See Land Use ND Building Footprint Layers (Info Layers folder)	
Total Score:			**24**		

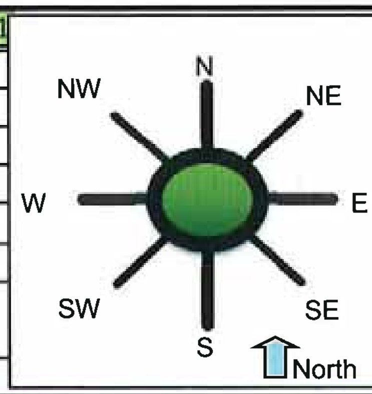
** remains incompletely mapped; digital layer includes paleo lakes and wetlands based on soils data
*** as evaluated by a qualified archeological professional or engineer based on coring, earlier as-built plans, or obvious surface evidence (such as a gravel pit)
~such as Milton acquifer, mountain top, etc. (historic or prehistoric sacred or traditional site locations, other prehistoric site types)
*Environmental predictive model limits wetlands to those > one acre in size; ArchSensMap

APPENDIX F

Traffic Analysis
Signal Warrant Analysis

General & Site Information v2.1

Analyst: David DeBaie
Agency/Co: Stantec
Date: 9/13/2012
Project or PI#: 195310774
Year, Peak Hour: 2012 DHV AM
County/District: Chittenden
Intersection Name: US 7 / Harbor Rd / Falls Rd



Volumes		Entry Legs (FROM) N (1)	NE (2)	E (3)	SE (4)	S (5)	SW (6)	W (7)	NW (8)
	N (1), vph			255		672		149	
Exit	NE (2), vph								
Legs	E (3), vph	89				1		84	
(TO)	SE (4), vph								
	S (5), vph	558		6				79	
	SW (6), vph								
	W (7), vph	146		217		112			
	NW (8), vph								
Output	Total Vehicles	793	0	478	0	785	0	312	0

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	90%	100%	96%	100%	90%	100%	96%	100%
% Heavy Vehicles	10%	0%	4%	0%	10%	0%	4%	0%
% Bicycle	0%	0%	0%	0%	0%	0%	0%	0%
# of Pedestrians (ped/hr)	0	0	21	0	7	0	18	0
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
F_{HV}	0.909	1.000	0.962	1.000	0.909	1.000	0.962	1.000
F_{ped}	1.000	1.000	1.000	1.000	0.999	1.000	0.998	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to Leg # N (1), pcu/h	0	0	265	0	739	0	155	0
NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	98	0	0	0	1	0	87	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	614	0	6	0	0	0	82	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	161	0	226	0	123	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Entry flow, pcu/h	872	0	497	0	864	0	324	0
Conflicting flow, pcu/h	355	0	1017	0	340	0	718	0

Roundabout Type Standard Single Lane or Urban Compact

Enter type here... Standard Single Lane

Results: Approach Measures of Effectiveness

HCM 2010 Model (build)	N	NE	E	SE	S	SW	W	NW
Entry Capacity, vph	720	NA	393	NA	730	NA	529	NA
Entry Flow Rates, vph	793	NA	478	NA	785	NA	312	NA
V/C ratio	**1.10**		**1.22**		**1.07**		**0.59**	
Control Delay, s/veh	**87**		**149**		**78**		**19**	
LOS	F		F		F		C	
95th % Queue (ft)	**616**		**513**		**575**		**99**	
Calibrated Model (future)	**N**	**NE**	**E**	**SE**	**S**	**SW**	**W**	**NW**
Entry Capacity, vph	912	NA	568	NA	922	NA	720	NA
Entry Flow Rates, vph	793	NA	478	NA	785	NA	312	NA
V/C ratio	**0.96**		**0.88**		**0.94**		**0.45**	
Control Delay, sec/pcu	**41**		**40**		**37**		**11**	
LOS	E		E		E		B	
95th % Queue (ft)	**434**		**258**		**404**		**61**	

Notes: v2.1

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

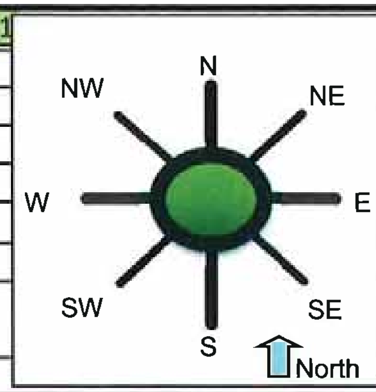
Bypass Lane Merge Point Analysis (if applicable)

Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)	**W (7)**					
Select Exit Leg for Bypass (TO)	**S (5)**					
Does the bypass have a dedicated receiving lane?	**No**					
Volumes						
Right Turn Volume removed from Entry Leg	**172**					
Volume Characteristics (for entry leg)						
PHF	1.00					
F_{HV}	0.96					
F_{ped}	1.00					
NOTE: Volume Characteristics for Exit Leg are already taken into account						
Entry/Conflicting Flows						
Entry Flow, pcu/hr	179					
Conflicting Flow, pcu/hr	702					
Bypass Lane Results (HCM 2010 Model)						
Entry Capacity of Bypass, vph	537					
Flow Rates of Exiting Traffic, vph	172					
V/C ratio	**0.32**					
Control Delay, s/veh	**11.4**					
LOS	B					
95th % Queue (ft)	**36**					
Approach w/Bypass Delay, s/veh	***16.4***					
Approach w/Bypass LOS	*C*					

General & Site Information

v2.1

Analyst:	David DeBaie
Agency/Co:	Stantec
Date:	9/13/2012
Project or PI#:	195310774
Year, Peak Hour:	2012 DHV AM Flare
County/District:	Chittenden
Intersection Name:	US 7 / Harbor Rd / Falls Rd



Volumes

Volumes		Entry Legs (FROM) N (1)	NE (2)	E (3)	SE (4)	S (5)	SW (6)	W (7)	NW (8)
	N (1), vph					672		149	
Exit	NE (2), vph								
Legs	E (3), vph	89				1		84	
(TO)	SE (4), vph								
	S (5), vph	558		6				79	
	SW (6), vph								
	W (7), vph			217		112			
	NW (8), vph								
Output	Total Vehicles	647	0	223	0	785	0	312	0

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	90%	100%	96%	100%	90%	100%	96%	100%
% Heavy Vehicles	10%	0%	4%	0%	10%	0%	4%	0%
% Bicycle	0%	0%	0%	0%	0%	0%	0%	0%
# of Pedestrians **(ped/hr)**	0	0	21	0	7	0	18	0
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
F_{HV}	0.909	1.000	0.962	1.000	0.909	1.000	0.962	1.000
F_{ped}	1.000	1.000	1.000	1.000	0.999	1.000	0.998	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to Leg # N (1), pcu/h	0	0	0	0	739	0	155	0
NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	98	0	0	0	1	0	87	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	614	0	6	0	0	0	82	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	0	0	226	0	123	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Entry flow, pcu/h	712	0	232	0	864	0	324	0
Conflicting flow, pcu/h	355	0	1017	0	340	0	718	0

Roundabout Type	Standard Single Lane or Urban Compact
Enter type here...	Standard Single Lane

Results: Approach Measures of Effectiveness

HCM 2010 Model (build)	N	NE	E	SE	S	SW	W	NW
Entry Capacity, vph	720	NA	393	NA	730	NA	529	NA
Entry Flow Rates, vph	647	NA	223	NA	785	NA	312	NA
V/C ratio	**0.90**		**0.57**		**1.07**		**0.59**	
Control Delay, s/veh	**37**		**23**		**78**		**19**	
LOS	E		C		F		C	
95th % Queue (ft)	**321**		**88**		**575**		**99**	
Calibrated Model (future)	**N**	**NE**	**E**	**SE**	**S**	**SW**	**W**	**NW**
Entry Capacity, vph	912	NA	568	NA	922	NA	720	NA
Entry Flow Rates, vph	647	NA	223	NA	785	NA	312	NA
V/C ratio	**0.78**		**0.41**		**0.94**		**0.45**	
Control Delay, sec/pcu	**20**		**13**		**37**		**11**	
LOS	C		B		E		B	
95th % Queue (ft)	**222**		**51**		**404**		**61**	

Notes:

v2.1

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

Bypass Lane Merge Point Analysis (if applicable)

Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)	W (7)					
Select Exit Leg for Bypass (TO)	S (5)					
Does the bypass have a dedicated receiving lane?	**No**					
Volumes						
Right Turn Volume removed from Entry Leg	**172**					
Volume Characteristics (for entry leg)						
PHF	1.00					
F_{HV}	0.96					
F_{ped}	1.00					
NOTE:* *Volume Characteristics for Exit Leg are already taken into account						
Entry/Conflicting Flows						
Entry Flow, pcu/hr	179					
Conflicting Flow, pcu/hr	702					
Bypass Lane Results (HCM 2010 Model)						
Entry Capacity of Bypass, vph	537					
Flow Rates of Exiting Traffic, vph	172					
V/C ratio	**0.32**					
Control Delay, s/veh	**11.4**					
LOS	B					
95th % Queue (ft)	**36**					
Approach w/Bypass Delay, s/veh	***16.4***					
Approach w/Bypass LOS	*C*					

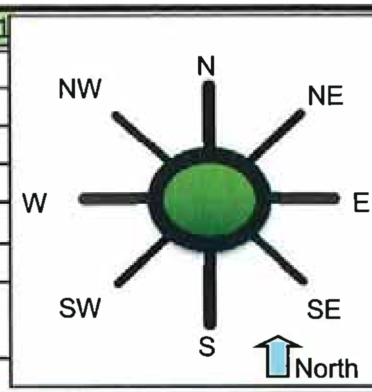
Roundabout Analysis Tool
Single Lane

3/24/2014
Version 2.1

General & Site Information

v2.1

Analyst:	David DeBaie
Agency/Co:	Stantec
Date:	9/13/2012
Project or PI#:	195310774
Year, Peak Hour:	2012 DHV PM Single Lane
County/District:	Chittenden
Intersection Name:	US 7 / Harbor Rd / Falls Rd



Volumes

		Entry Legs (FROM)							
		N (1)	NE (2)	E (3)	SE (4)	S (5)	SW (6)	W (7)	NW (8)
	N (1), vph	118		189		706		113	
Exit	NE (2), vph								
Legs	E (3), vph	158				11		113	
(TO)	SE (4), vph								
	S (5), vph	757		9					
	SW (6), vph							76	
	W (7), vph			206		65			
	NW (8), vph								
Output	Total Vehicles	1033	0	404	0	782	0	302	0

Volume Characteristics

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	95%	100%	99%	100%	94%	100%	99%	100%
% Heavy Vehicles	5%	0%	1%	0%	6%	0%	1%	0%
% Bicycle	0%	0%	0%	0%	0%	0%	0%	0%
# of Pedestrians (ped/hr)	0	0	18	0	21	0	7	0
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
F_{HV}	0.952	1.000	0.990	1.000	0.943	1.000	0.990	1.000
F_{ped}	1.000	1.000	1.000	1.000	0.997	1.000	1.000	1.000

Entry/Conflicting Flows

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to Leg # N (1), pcu/h	124	0	191	0	748	0	114	0
NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	166	0	0	0	12	0	114	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	795	0	9	0	0	0	0	0
SW (6), pcu/h	0	0	0	0	0	0	77	0
W (7), pcu/h	0	0	208	0	69	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Entry flow, pcu/h	1085	0	408	0	829	0	305	0
Conflicting flow, pcu/h	286	0	1055	0	518	0	1094	0

Roundabout Type

Roundabout Type	Standard Single Lane or Urban Compact
Enter type here...	Standard Single Lane

Results: Approach Measures of Effectiveness

HCM 2010 Model (build)	N	NE	E	SE	S	SW	W	NW
Entry Capacity, vph	808	NA	389	NA	633	NA	375	NA
Entry Flow Rates, vph	1033	NA	404	NA	782	NA	302	NA
V/C ratio	**1.28**		**1.04**		**1.24**		**0.81**	
Control Delay, s/veh	**152**		**89**		**141**		**43**	
LOS	F		F		F		E	
95th % Queue (ft)	**1003**		**335**		**763**		**177**	
Calibrated Model (future)	**N**	**NE**	**E**	**SE**	**S**	**SW**	**W**	**NW**
Entry Capacity, vph	1010	NA	567	NA	828	NA	550	NA
Entry Flow Rates, vph	1033	NA	404	NA	782	NA	302	NA
V/C ratio	**1.07**		**0.72**		**1.00**		**0.55**	
Control Delay, sec/pcu	**70**		**25**		**54**		**17**	
LOS	F		C		F		C	
95th % Queue (ft)	**666**		**150**		**468**		**85**	

Notes:

v2.1

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

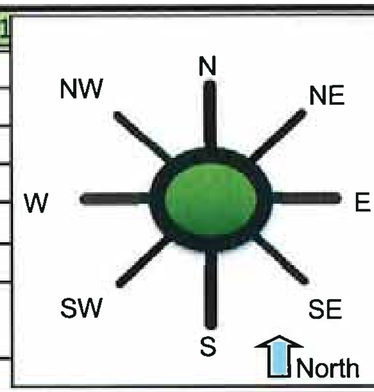
Bypass Lane Merge Point Analysis (if applicable)

Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)	**W (7)**					
Select Exit Leg for Bypass (TO)	**S (5)**					
Does the bypass have a dedicated receiving lane?	**No**					
Volumes						
Right Turn Volume removed from Entry Leg	**172**					
Volume Characteristics (for entry leg)						
PHF	1.00					
F_{HV}	0.99					
F_{ped}	1.00					
NOTE: Volume Characteristics for Exit Leg are already taken into account						
Entry/Conflicting Flows						
Entry Flow, pcu/hr	174					
Conflicting Flow, pcu/hr	804					
Bypass Lane Results (HCM 2010 Model)						
Entry Capacity of Bypass, vph	501					
Flow Rates of Exiting Traffic, vph	172					
V/C ratio	**0.34**					
Control Delay, s/veh	**12.6**					
LOS	B					
95th % Queue (ft)	**38**					
Approach w/Bypass Delay, s/veh	***32.2***					
Approach w/Bypass LOS	*D*					

General & Site Information

v2.1

Analyst:	David DeBaie
Agency/Co:	Stantec
Date:	9/13/2012
Project or PI#:	195310774
Year, Peak Hour:	2012 DHV PM Single Lane Flare
County/District:	Chittenden
Intersection Name:	US 7 / Harbor Rd / Falls Rd



Volumes

		Entry Legs (FROM)							
		N (1)	NE (2)	E (3)	SE (4)	S (5)	SW (6)	W (7)	NW (8)
	N (1), vph					706		113	
Exit	NE (2), vph								
Legs	E (3), vph	158				11		113	
(TO)	SE (4), vph								
	S (5), vph	757		9					
	SW (6), vph								
	W (7), vph			206		65		76	
	NW (8), vph								
Output	Total Vehicles	915	0	215	0	782	0	302	0

Volume Characteristics

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	95%	100%	99%	100%	94%	100%	99%	100%
% Heavy Vehicles	5%	0%	1%	0%	6%	0%	1%	0%
% Bicycle	0%	0%	0%	0%	0%	0%	0%	0%
# of Pedestrians **(ped/hr)**	0	0	18	0	21	0	7	0
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
F_{HV}	0.952	1.000	0.990	1.000	0.943	1.000	0.990	1.000
F_{ped}	1.000	1.000	1.000	1.000	0.997	1.000	1.000	1.000

Entry/Conflicting Flows

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to Leg # N (1), pcu/h	0	0	0	0	748	0	114	0
NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	166	0	0	0	12	0	114	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	795	0	9	0	0	0	0	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	0	0	208	0	69	0	77	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Entry flow, pcu/h	961	0	217	0	829	0	305	0
Conflicting flow, pcu/h	363	0	1008	0	471	0	970	0

Roundabout Type

Standard Single Lane or Urban Compact

Enter type here...	Standard Single Lane

Results: Approach Measures of Effectiveness

HCM 2010 Model (build)	N	NE	E	SE	S	SW	W	NW
Entry Capacity, vph	749	NA	408	NA	664	NA	424	NA
Entry Flow Rates, vph	915	NA	215	NA	782	NA	302	NA
V/C ratio	**1.22**		**0.53**		**1.18**		**0.71**	
Control Delay, s/veh	**131**		**21**		**117**		**30**	
LOS	F		C		F		D	
95th % Queue (ft)	**830**		**75**		**690**		**138**	
Calibrated Model (future)	**N**	**NE**	**E**	**SE**	**S**	**SW**	**W**	**NW**
Entry Capacity, vph	950	NA	589	NA	860	NA	608	NA
Entry Flow Rates, vph	915	NA	215	NA	782	NA	302	NA
V/C ratio	**1.01**		**0.37**		**0.96**		**0.50**	
Control Delay, sec/pcu	**53**		**11**		**44**		**14**	
LOS	F		B		E		B	
95th % Queue (ft)	**517**		**43**		**418**		**71**	

Notes:

v2.1

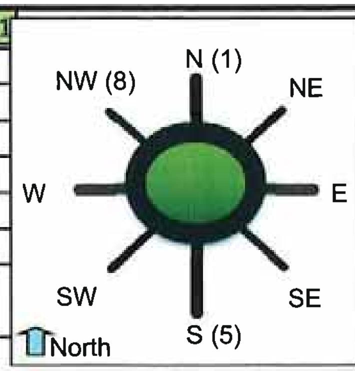
Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

Bypass Lane Merge Point Analysis (if applicable)

Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)	**W (7)**					
Select Exit Leg for Bypass (TO)	**S (5)**					
Does the bypass have a dedicated receiving lane?	**No**					
Volumes						
Right Turn Volume removed from Entry Leg	**172**					
Volume Characteristics (for entry leg)						
PHF	1.00					
F_{HV}	0.99					
F_{ped}	1.00					
NOTE:* *Volume Characteristics for Exit Leg are already taken into account						
Entry/Conflicting Flows						
Entry Flow, pcu/hr	174					
Conflicting Flow, pcu/hr	804					
Bypass Lane Results (HCM 2010 Model)						
Entry Capacity of Bypass, vph	501					
Flow Rates of Exiting Traffic, vph	172					
V/C ratio	**0.34**					
Control Delay, s/veh	**12.6**					
LOS	B					
95th % Queue (ft)	**38**					
Approach w/Bypass Delay, s/veh	***24.0***					
Approach w/Bypass LOS	*C*					

General & Site Information v2.1

Analyst:	David DeBaie
Agency/Co:	Stantec
Date:	9/13/2012
Project or PI#:	Shelburne - US 7 / Falls Road / Harbor Road Scoping Study
Year, Peak Hour:	2032 DHV AM Peak Hour
County/District:	Chittenden
Intersection:	US 7 / Falls Road / Harbor Road



Volumes

Entry Legs (FROM)	N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
Lane Designation	Right-Thru	Left-Thru	No Lane	No Lane	Left-Thru	Right only	No Lane	No Lane
Exit Legs (TO) N (1), vph						255		
NE (2), vph								
E (3), vph		89						
SE (4), vph								
S (5), vph	283	274			6			
SW (6), vph								
W (7), vph	146				217			
NW (8), vph								
Entry Volume, vph	429	363	0	0	223	255	0	0

	S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
Lane Designation	Left-Thru	Right-Thru	No Lane	No Lane	Lf-Th-Rt	No Lane	No Lane	No Lane
N (1), vph	257	415			149			
NE (2), vph								
E (3), vph		1			84			
SE (4), vph								
S (5), vph					79			
SW (6), vph								
W (7), vph	112							
NW (8), vph								
Entry Volume, vph	369	416	0	0	312	0	0	0

	N	NE	E	SE	S	SW	W	NW
# of Entry Flow Lanes	2	0	2	0	2	0	1	0
# of Conflict Flow Lanes	1		2		1		2	

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	89%	100%	95%	100%	89%	100%	95%	100%
% Heavy Vehicles	10%	0%	4%	0%	10%	0%	4%	0%
% Bicycles	1%	0%	1%	0%	1%	0%	1%	0%
# of Pedestrians (ped/hr)		0	18	0	21	0	7	0
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
F_{hv}	0.913	1.000	0.966	1.000	0.913	1.000	0.966	1.000
F_{ped}	1.000	1.000	1.000	1.000	0.983	1.000	0.998	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to N (1), pcu/h	0	0	264	0	736	0	154	0

Leg #								
NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	97	0	0	0	1	0	87	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	610	0	6	0	0	0	82	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	160	0	225	0	123	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Entry flow, pcu/h	867	0	495	0	860	0	323	0
Entry flow Lane 1, pcu/h	470	0	231	0	404	0	323	0
Entry flow Lane 2, pcu/h	397	0	264	0	456	0	0	0
Conflicting flow, pcu/h	353	0	1013	0	339	0	714	0

Results: Approach Measures of Effectiveness

HCM 2010 Model *(build yr)*	**N**		**E**		**S**		**W**	
Lane Designations	*Right-Thru*	*Left-Thru*	*Left-Thru*	*Right only*	*Left-Thru*	*Right-Thru*	*Lf-Th-Rt*	*No Lane*
Entry Capacity, veh/h	725	725	511	537	723	723	661	NA
Entry Flow Rates, veh/h	429	363	223	255	369	416	312	NA
V/C ratio	**0.59**	**0.50**	**0.44**	**0.47**	**0.51**	**0.58**	**0.47**	
Control Delay, s/veh	**14.9**	**12.4**	**14.6**	**15.0**	**12.6**	**14.4**	**12.6**	
LOS	B	B	B	B	B	B	B	
95th % Queue (ft)	**108**	**78**	**57**	**65**	**80**	**102**	**66**	
Approach Delay, LOS	13.7 sec, LOS B		14.8 sec, LOS B		13.6 sec, LOS B		12.6 sec, LOS B	
	NE		**SE**		**SW**		**NW**	
Lane Designations	*No Lane*	*No Lane*	*No Lane*	*No Lane*	*No Lane*	*No Lane*	*No Lane*	*No Lane*
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
V/C ratio								
Control Delay, sec/pcu								
LOS								
95th % Queue (ft)								
Approach Delay, LOS								

Calibrated Model *(future yr)*	**N**		**E**		**S**		**W**	
Lane Designations	*Right-Thru*	*Left-Thru*	*Left-Thru*	*Right only*	*Left-Thru*	*Right-Thru*	*Lf-Th-Rt*	*No Lane*
Entry Capacity, veh/h	924	924	576	637	921	921	832	NA
Entry Flow Rates, veh/h	429	363	223	255	369	416	312	NA
V/C ratio	**0.46**	**0.39**	**0.39**	**0.40**	**0.40**	**0.45**	**0.38**	
Control Delay, s/veh	**9.6**	**8.4**	**12.1**	**11.4**	**8.5**	**9.3**	**8.8**	
LOS	A	A	B	B	A	A	A	
95th % Queue (ft)	**68**	**52**	**47**	**50**	**53**	**65**	**45**	
Approach Delay, LOS	9 sec, LOS A		11.7 sec, LOS B		8.9 sec, LOS A		8.8 sec, LOS A	
	NE		**SE**		**SW**		**NW**	
Lane Designations	*No Lane*	*No Lane*	*No Lane*	*No Lane*	*No Lane*	*No Lane*	*No Lane*	*No Lane*
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
V/C ratio								
Control Delay, sec/pcu								
LOS								
95th % Queue (ft)								
Approach Delay, LOS								

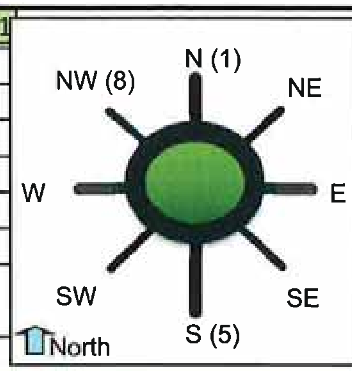
v2.1

Bypass Lane Merge Point Analysis (if applicable)

Bypass Characteristics	**Bypass #1**	**Bypass #2**	**Bypass #3**	**Bypass #4**	**Bypass #5**	**Bypass #6**
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Does the bypass have a dedicated receiving lane?						
# of Conflicting Exit Flow Lanes	**2**	**2**	**2**	**2**	**2**	**2**
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: ***(Select Input Method)***						
*Lane Flow in Exit Leg****						
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)						
F_{HV} (Entry Leg)						
F_{ped}						
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
*******Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.***						
Entry/Conflicting Flows						
Entry Flow						
Conflicting Critical Flow						
Bypass Lane Results						
Entry Capacity of Bypass, veh/h						
Flow Rates of Exiting Traffic, veh/h						
V/C ratio						
Control Delay, sec/pcu						
LOS						
95th % Queue (ft)						

General & Site Information v2.1

Analyst:	David DeBaie
Agency/Co:	Stantec
Date:	9/13/2012
Project or PI#:	Shelburne - US 7 / Falls Road / Harbor Road Scoping Study
Year, Peak Hour:	2032 DHV PM Peak Hour
County/District:	Chittenden
Intersection:	US 7 / Falls Road / Harbor Road



Volumes

Entry Legs (FROM)	N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
Lane Designation	Left-Thru	Right-Thru	No Lane	No Lane	Left-Thru	Right only	No Lane	No Lane
Exit Legs (TO) N (1), vph						189		
NE (2), vph								
E (3), vph	158							
SE (4), vph								
S (5), vph	327	430			9			
SW (6), vph								
W (7), vph		118			206			
NW (8), vph								
Entry Volume, vph	485	548	0	0	215	189	0	0

	S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
Lane Designation	Left-Thru	Right-Thru	No Lane	No Lane	Lf-Th-Rt	No Lane	No Lane	No Lane
N (1), vph	303	403			113			
NE (2), vph								
E (3), vph		11			113			
SE (4), vph								
S (5), vph					76			
SW (6), vph								
W (7), vph	65							
NW (8), vph								
Entry Volume, vph	368	414	0	0	302	0	0	0

	N	NE	E	SE	S	SW	W	NW
# of Entry Flow Lanes	2	0	2	0	2	0	1	0
# of Conflict Flow Lanes	1		2		1		2	

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	94%	100%	98%	100%	93%	100%	98%	100%
% Heavy Vehicles	5%	0%	1%	0%	6%	0%	1%	0%
% Bicycles	1%	0%	1%	0%	1%	0%	1%	0%
# of Pedestrians (ped/hr)		0	18	0	21	0	7	0
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
F_{hv}	0.957	1.000	0.995	1.000	0.948	1.000	0.995	1.000
F_{ped}	1.000	1.000	1.000	1.000	0.984	1.000	1.000	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to N (1), pcu/h	0	0	190	0	745	0	114	0

Leg #								
NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	165	0	0	0	12	0	114	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	791	0	9	0	0	0	76	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	123	0	207	0	69	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Entry flow, pcu/h	1079	0	406	0	825	0	304	0
Entry flow Lane 1, pcu/h	507	0	216	0	388	0	304	0
Entry flow Lane 2, pcu/h	573	0	190	0	437	0	0	0
Conflicting flow, pcu/h	285	0	927	0	392	0	965	0

Results: Approach Measures of Effectiveness

HCM 2010 Model *(build yr)*	**N**		**E**		**S**		**W**	
Lane Designations	*Left-Thru*	*Right-Thru*	*Left-Thru*	*Right only*	*Left-Thru*	*Right-Thru*	*Lf-Th-Rt*	*No Lane*
Entry Capacity, veh/h	813	813	561	588	712	712	572	NA
Entry Flow Rates, veh/h	485	548	215	189	368	414	302	NA
V/C ratio	**0.60**	**0.67**	**0.38**	**0.32**	**0.52**	**0.58**	**0.53**	
Control Delay, s/veh	**13.7**	**16.4**	**12.3**	**10.6**	**12.9**	**14.7**	**15.7**	
LOS	B	C	B	B	B	B	C	
95th % Queue (ft)	**105**	**139**	**45**	**35**	**79**	**100**	**77**	
Approach Delay, LOS	15.2 sec, LOS C		11.5 sec, LOS B		13.9 sec, LOS B		15.7 sec, LOS C	
	NE		**SE**		**SW**		**NW**	
Lane Designations	*No Lane*	*No Lane*	*No Lane*	*No Lane*	*No Lane*	*No Lane*	*No Lane*	*No Lane*
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
V/C ratio								
Control Delay, sec/pcu								
LOS								
95th % Queue (ft)								
Approach Delay, LOS								

Calibrated Model *(future yr)*	**N**		**E**		**S**		**W**	
Lane Designations	*Left-Thru*	*Right-Thru*	*Left-Thru*	*Right only*	*Left-Thru*	*Right-Thru*	*Lf-Th-Rt*	*No Lane*
Entry Capacity, veh/h	1037	1037	646	709	907	907	685	NA
Entry Flow Rates, veh/h	485	548	215	189	368	414	302	NA
V/C ratio	**0.47**	**0.53**	**0.33**	**0.27**	**0.41**	**0.46**	**0.44**	
Control Delay, s/veh	**8.8**	**9.9**	**10.0**	**8.3**	**8.7**	**9.5**	**11.5**	
LOS	A	A	A	A	A	A	B	
95th % Queue (ft)	**66**	**84**	**37**	**27**	**52**	**64**	**57**	
Approach Delay, LOS	9.4 sec, LOS A		9.2 sec, LOS A		9.1 sec, LOS A		11.5 sec, LOS B	
	NE		**SE**		**SW**		**NW**	
Lane Designations	*No Lane*	*No Lane*	*No Lane*	*No Lane*	*No Lane*	*No Lane*	*No Lane*	*No Lane*
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
V/C ratio								
Control Delay, sec/pcu								
LOS								
95th % Queue (ft)								
Approach Delay, LOS								

v2.1

Bypass Lane Merge Point Analysis (if applicable)

Bypass Characteristics	**Bypass #1**	**Bypass #2**	**Bypass #3**	**Bypass #4**	**Bypass #5**	**Bypass #6**
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Does the bypass have a dedicated receiving lane?						
# of Conflicting Exit Flow Lanes	**2**	**2**	**2**	**2**	**2**	**2**
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: ***(Select Input Method)***						
*Lane Flow in Exit Leg****						
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)						
F_{HV} (Entry Leg)						
F_{ped}						
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
*******Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.***						
Entry/Conflicting Flows						
Entry Flow						
Conflicting Critical Flow						
Bypass Lane Results						
Entry Capacity of Bypass, veh/h						
Flow Rates of Exiting Traffic, veh/h						
V/C ratio						
Control Delay, sec/pcu						
LOS						
95th % Queue (ft)						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	133	76	72	6	197	228	101	596	1	75	490	130
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1900	1900	1750	1900	1900	1750	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.98			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.93		1.00	1.00		1.00	0.97	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1739			2231		1641	1591		1641	1527	
Flt Permitted		0.98			1.00		0.16	1.00		0.18	1.00	
Satd. Flow (perm)		1739			2231		268	1591		308	1527	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	133	76	72	6	197	228	101	596	1	75	490	130
RTOR Reduction (vph)	0	14	0	0	45	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	267	0	0	386	0	101	597	0	75	610	0
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	10%	10%	0%	10%	10%	10%
Turn Type	Split	NA		Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	3		4	4		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		12.2			14.0		39.0	35.1		39.0	35.1	
Effective Green, g (s)		12.2			14.0		39.0	35.1		39.0	35.1	
Actuated g/C Ratio		0.14			0.16		0.44	0.39		0.44	0.39	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		237			350		177	626		192	600	
v/s Ratio Prot		c0.15			c0.17		c0.02	0.38		0.02	c0.40	
v/s Ratio Perm							0.22			0.15		
v/c Ratio		1.13			1.10		0.57	0.95		0.39	1.02	
Uniform Delay, d1		38.5			37.6		18.3	26.3		17.5	27.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		97.0			79.0		4.4	24.8		1.3	40.8	
Delay (s)		135.5			116.6		22.7	51.1		18.8	67.9	
Level of Service		F			F		C	D		B	E	
Approach Delay (s)		135.5			116.6			47.0			62.6	
Approach LOS		F			F			D			E	

Intersection Summary			
HCM 2000 Control Delay	78.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	89.2	Sum of lost time (s)	24.0
Intersection Capacity Utilization	97.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	1	1	2	0	11	6	723	17	47	492	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	1	1	2	0	11	6	723	17	47	492	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											927	
pX, platoon unblocked	0.75	0.75	0.75	0.75	0.75		0.75					
vC, conflicting volume	1344	1342	496	1335	1338	732	500			740		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1293	1290	165	1281	1284	732	170			740		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	98	100	97	99			95		
cM capacity (veh/h)	98	116	662	101	117	421	1058			867		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	3	13	746	547
Volume Left	1	2	6	47
Volume Right	1	11	17	8
cSH	147	284	1058	867
Volume to Capacity	0.02	0.05	0.01	0.05
Queue Length 95th (ft)	2	4	0	4
Control Delay (s)	30.0	18.3	0.2	1.5
Lane LOS	D	C	A	A
Approach Delay (s)	30.0	18.3	0.2	1.5
Approach LOS	D	C		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	18	42	16	455	131	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	18	42	16	455	131	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1102	
pX, platoon unblocked						
vC, conflicting volume	620	132	134			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	620	132	134			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	95	99			
cM capacity (veh/h)	447	917	1451			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	60	471	134
Volume Left	18	16	0
Volume Right	42	0	3
cSH	697	1451	1700
Volume to Capacity	0.09	0.01	0.08
Queue Length 95th (ft)	7	1	0
Control Delay (s)	10.7	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	10.7	0.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	103	70	8	187	158	59	592	10	80	679	98
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1900	1900	1750	1900	1900	1750	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.98			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.94		1.00	1.00		1.00	0.98	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1731			2323		1703	1646		1719	1626	
Flt Permitted		0.98			1.00		0.10	1.00		0.21	1.00	
Satd. Flow (perm)		1731			2323		188	1646		378	1626	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	96	103	70	8	187	158	59	592	10	80	679	98
RTOR Reduction (vph)	0	14	0	0	32	0	0	1	0	0	6	0
Lane Group Flow (vph)	0	255	0	0	321	0	59	601	0	80	771	0
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	5%	5%	5%	1%	1%	1%	6%	6%	0%	5%	5%	5%
Turn Type	Split	NA		Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	3		4	4		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		12.2			11.4		42.0	38.1		42.0	38.1	
Effective Green, g (s)		12.2			11.4		42.0	38.1		42.0	38.1	
Actuated g/C Ratio		0.14			0.13		0.47	0.43		0.47	0.43	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		235			295		154	699		235	691	
v/s Ratio Prot		c0.15			c0.14		c0.02	0.37		0.01	c0.47	
v/s Ratio Perm							0.16			0.14		
v/c Ratio		1.09			1.09		0.38	0.86		0.34	1.12	
Uniform Delay, d1		38.7			39.1		19.5	23.3		15.7	25.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		83.5			77.7		1.6	10.5		0.9	70.8	
Delay (s)		122.2			116.8		21.1	33.9		16.6	96.5	
Level of Service		F			F		C	C		B	F	
Approach Delay (s)		122.2			116.8			32.7			89.0	
Approach LOS		F			F			C			F	

Intersection Summary			
HCM 2000 Control Delay	80.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	89.6	Sum of lost time (s)	24.0
Intersection Capacity Utilization	100.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	3	1	17	2	16	2	686	42	58	668	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	3	1	17	2	16	2	686	42	58	668	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											927	
pX, platoon unblocked	0.63	0.63	0.63	0.63	0.63		0.63					
vC, conflicting volume	1516	1520	672	1501	1502	707	675			728		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1525	1531	184	1502	1503	707	189			728		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	96	100	70	97	96	100			93		
cM capacity (veh/h)	54	68	540	57	71	434	872			871		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	35	730	733
Volume Left	1	17	2	58
Volume Right	1	16	42	7
cSH	78	97	872	871
Volume to Capacity	0.06	0.36	0.00	0.07
Queue Length 95th (ft)	5	36	0	5
Control Delay (s)	54.3	61.9	0.1	1.7
Lane LOS	F	F	A	A
Approach Delay (s)	54.3	61.9	0.1	1.7
Approach LOS	F	F		

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	46	51	30	322	354	23
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	46	51	30	322	354	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1102	
pX, platoon unblocked						
vC, conflicting volume	748	366	377			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	748	366	377			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	92	97			
cM capacity (veh/h)	371	680	1187			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	97	352	377
Volume Left	46	30	0
Volume Right	51	0	23
cSH	487	1187	1700
Volume to Capacity	0.20	0.03	0.22
Queue Length 95th (ft)	18	2	0
Control Delay (s)	14.2	0.9	0.0
Lane LOS	B	A	
Approach Delay (s)	14.2	0.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	84	79	6	217	255	80	704	1	89	558	146
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1000	1900	1750	1900	1900	1750	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.98			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.93		1.00	1.00		1.00	0.97	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1736			2229		1641	1591		1641	1527	
Flt Permitted		0.98			1.00		0.12	1.00		0.12	1.00	
Satd. Flow (perm)		1736			2229		210	1591		209	1527	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	149	84	79	6	217	255	80	704	1	89	558	146
RTOR Reduction (vph)	0	12	0	0	41	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	300	0	0	437	0	80	705	0	89	694	0
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	10%	10%	0%	10%	10%	10%
Turn Type	Split	NA		Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	3		4	4		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		13.0			15.0		47.0	43.1		47.0	43.1	
Effective Green, g (s)		13.0			15.0		47.0	43.1		47.0	43.1	
Actuated g/C Ratio		0.13			0.15		0.47	0.44		0.47	0.44	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		227			337		156	692		155	664	
v/s Ratio Prot		c0.17			c0.20		0.02	0.44		c0.02	c0.45	
v/s Ratio Perm							0.22			0.25		
v/c Ratio		1.32			1.30		0.51	1.02		0.57	1.05	
Uniform Delay, d1		43.0			42.0		19.5	27.9		19.7	27.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		171.8			154.1		2.8	39.0		5.1	47.5	
Delay (s)		214.8			196.1		22.3	67.0		24.7	75.4	
Level of Service		F			F		C	E		C	E	
Approach Delay (s)		214.8			196.1			62.4			69.7	
Approach LOS		F			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	111.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	99.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	104.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	1	1	3	0	13	6	811	19	51	561	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	1	1	3	0	13	6	811	19	51	561	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											927	
pX, platoon unblocked	0.68	0.68	0.68	0.68	0.68		0.68					
vC, conflicting volume	1513	1510	566	1502	1504	820	570			830		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1519	1514	127	1502	1507	820	134			830		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	99	100	95	100	97	99			94		
cM capacity (veh/h)	61	76	628	64	77	375	988			802		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	3	16	836	621
Volume Left	1	3	6	51
Volume Right	1	13	19	9
cSH	96	196	988	802
Volume to Capacity	0.03	0.08	0.01	0.06
Queue Length 95th (ft)	2	7	0	5
Control Delay (s)	43.8	25.0	0.2	1.7
Lane LOS	E	D	A	A
Approach Delay (s)	43.8	25.0	0.2	1.7
Approach LOS	E	D		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	20	46	18	504	150	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	46	18	504	150	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1102	
pX, platoon unblocked						
vC, conflicting volume	692	152	154			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	692	152	154			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	95	99			
cM capacity (veh/h)	405	894	1426			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	66	522	154
Volume Left	20	18	0
Volume Right	46	0	4
cSH	654	1426	1700
Volume to Capacity	0.10	0.01	0.09
Queue Length 95th (ft)	8	1	0
Control Delay (s)	11.1	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	11.1	0.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	113	76	9	206	189	65	706	11	80	815	118
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1900	1900	1750	1900	1900	1750	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.98			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.94		1.00	1.00		1.00	0.98	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1729			2316		1703	1646		1719	1626	
Flt Permitted		0.98			1.00		0.09	1.00		0.12	1.00	
Satd. Flow (perm)		1729			2316		163	1646		222	1626	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	113	113	76	9	206	189	65	706	11	80	815	118
RTOR Reduction (vph)	0	12	0	0	31	0	0	1	0	0	5	0
Lane Group Flow (vph)	0	290	0	0	373	0	65	716	0	80	928	0
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	5%	5%	5%	1%	1%	1%	6%	6%	0%	5%	5%	5%
Turn Type	Split	NA		Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	3		4	4		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		14.0			13.0		48.0	44.1		48.0	44.1	
Effective Green, g (s)		14.0			13.0		48.0	44.1		48.0	44.1	
Actuated g/C Ratio		0.14			0.13		0.48	0.45		0.48	0.45	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		244			304		139	733		166	724	
v/s Ratio Prot		c0.17			c0.16		0.02	0.44		c0.02	c0.57	
v/s Ratio Perm							0.21			0.21		
v/c Ratio		1.19			1.23		0.47	0.98		0.48	1.28	
Uniform Delay, d1		42.5			43.0		22.1	27.0		19.0	27.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		118.2			127.4		2.5	27.4		2.2	137.2	
Delay (s)		160.7			170.4		24.6	54.3		21.2	164.7	
Level of Service		F			F		C	D		C	F	
Approach Delay (s)		160.7			170.4			51.9			153.4	
Approach LOS		F			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	125.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	99.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	113.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	4	1	19	3	18	3	810	46	64	801	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	4	1	19	3	18	3	810	46	64	801	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											927	
pX, platoon unblocked	0.59	0.59	0.59	0.59	0.59		0.59					
vC, conflicting volume	1792	1795	805	1775	1776	833	809			856		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1992	1998	327	1964	1966	833	334			856		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	88	100	19	91	95	100			92		
cM capacity (veh/h)	22	33	423	24	34	367	726			780		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	6	40	859	873
Volume Left	1	19	3	64
Volume Right	1	18	46	8
cSH	35	42	726	780
Volume to Capacity	0.17	0.94	0.00	0.08
Queue Length 95th (ft)	13	93	0	7
Control Delay (s)	127.1	267.6	0.1	2.2
Lane LOS	F	F	A	A
Approach Delay (s)	127.1	267.6	0.1	2.2
Approach LOS	F	F		

Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	102.8%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	46	51	30	322	354	23
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	46	51	30	322	354	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1102	
pX, platoon unblocked						
vC, conflicting volume	748	366	377			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	748	366	377			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	92	97			
cM capacity (veh/h)	371	680	1187			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	97	352	377
Volume Left	46	30	0
Volume Right	51	0	23
cSH	487	1187	1700
Volume to Capacity	0.20	0.03	0.22
Queue Length 95th (ft)	18	2	0
Control Delay (s)	14.2	0.9	0.0
Lane LOS	B	A	
Approach Delay (s)	14.2	0.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	84	79	19	217	266	112	672	1	89	558	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1750	1900	1900	1750	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97			1.00	1.00	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.93			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1647			1812	1553	1640	1591		1640	1591	1434
Flt Permitted	0.25	1.00			0.96	1.00	0.23	1.00		0.12	1.00	1.00
Satd. Flow (perm)	454	1647			1748	1553	399	1591		213	1591	1434
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	149	84	79	19	217	266	112	672	1	89	558	146
RTOR Reduction (vph)	0	27	0	0	0	212	0	0	0	0	0	75
Lane Group Flow (vph)	149	136	0	0	236	54	112	673	0	89	558	71
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	10%	10%	0%	10%	10%	10%
Turn Type	pm+pt	NA		custom	NA	custom	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	8				1	5	2		1	6	3
Permitted Phases	8	8		4	4	4	2	2		6	6	6
Actuated Green, G (s)	30.3	30.3			17.2	22.2	50.4	45.4		50.4	45.4	52.5
Effective Green, g (s)	30.3	30.3			17.2	22.2	50.4	45.4		50.4	45.4	52.5
Actuated g/C Ratio	0.28	0.28			0.16	0.20	0.46	0.42		0.46	0.42	0.48
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	210	459			277	403	242	665		164	665	693
v/s Ratio Prot	c0.05	0.08				0.01	0.02	c0.42		c0.02	0.35	0.01
v/s Ratio Perm	0.15				c0.13	0.03	0.19			0.23		0.04
v/c Ratio	0.71	0.30			0.85	0.14	0.46	1.01		0.54	0.84	0.10
Uniform Delay, d1	32.2	30.7			44.4	35.3	19.4	31.6		21.7	28.3	15.2
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.5	0.4			21.5	0.2	1.4	37.9		3.6	9.1	0.1
Delay (s)	42.7	31.1			65.9	35.4	20.8	69.5		25.4	37.4	15.3
Level of Service	D	C			E	D	C	E		C	D	B
Approach Delay (s)		36.6			49.8			62.5			32.0	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	46.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	108.5	Sum of lost time (s)	27.0
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	113	76	9	228	193	65	706	11	158	757	118
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1900	1900	1750	1900	1900	1750	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98			1.00	1.00	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	1717			2465	1599	1703	1648		1718	1667	1504
Flt Permitted	0.21	1.00			0.98	1.00	0.16	1.00		0.15	1.00	1.00
Satd. Flow (perm)	373	1717			2423	1599	279	1648		278	1667	1504
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	113	113	76	9	228	193	65	706	11	158	757	118
RTOR Reduction (vph)	0	19	0	0	0	155	0	1	0	0	0	50
Lane Group Flow (vph)	113	170	0	0	237	38	65	716	0	158	757	68
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	5%	5%	5%	1%	1%	1%	6%	6%	0%	5%	5%	5%
Turn Type	pm+pt	NA		custom	NA	custom	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	8				1	5	2		1	6	3
Permitted Phases	8			4	4	4	2	2		6	6	6
Actuated Green, G (s)	27.4	27.4			13.5	19.5	51.3	47.3		55.3	49.3	57.2
Effective Green, g (s)	27.4	27.4			13.5	19.5	51.3	47.3		55.3	49.3	57.2
Actuated g/C Ratio	0.28	0.28			0.14	0.20	0.52	0.48		0.56	0.50	0.58
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	211	476			331	413	202	789		243	832	963
v/s Ratio Prot	c0.04	0.10				0.01	0.01	0.43		c0.04	c0.45	0.01
v/s Ratio Perm	0.11				c0.10	0.02	0.15			0.32		0.04
v/c Ratio	0.54	0.36			0.72	0.09	0.32	0.91		0.65	0.91	0.07
Uniform Delay, d1	28.5	28.6			40.8	32.4	16.2	23.7		16.4	22.7	9.1
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.6	0.5			7.2	0.1	0.9	14.1		6.1	13.7	0.0
Delay (s)	31.1	29.1			48.0	32.5	17.1	37.8		22.5	36.4	9.1
Level of Service	C	C			D	C	B	D		C	D	A
Approach Delay (s)		29.8			41.0			36.1			31.1	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	98.7	Sum of lost time (s)	27.0
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	84	79	19	217	266	112	672	1	89	558	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1750	1900	1900	1750	1900
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		0.99			1.00	1.00	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		0.97			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected		0.98			1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1700			1815	1553	1640	1591		1641	1591	1432
Flt Permitted		0.40			0.95	1.00	0.20	1.00		0.09	1.00	1.00
Satd. Flow (perm)		690			1733	1553	347	1591		163	1591	1432
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	149	84	79	19	217	266	112	672	1	89	558	146
RTOR Reduction (vph)	0	10	0	0	0	199	0	0	0	0	0	82
Lane Group Flow (vph)	0	302	0	0	236	67	112	673	0	89	558	64
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	10%	10%	0%	10%	10%	10%
Turn Type	pm+pt	NA		custom	NA	custom	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	8				1	5	2		1	6	3
Permitted Phases	8	8		4	4	4	2	2		6	6	6
Actuated Green, G (s)		33.3			22.3	27.3	47.4	42.4		47.4	42.4	47.4
Effective Green, g (s)		33.3			22.3	27.3	47.4	42.4		47.4	42.4	47.4
Actuated g/C Ratio		0.31			0.21	0.25	0.44	0.39		0.44	0.39	0.44
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		258			356	476	211	621		139	621	625
v/s Ratio Prot		c0.05				0.01	0.02	c0.42		c0.03	0.35	0.00
v/s Ratio Perm		c0.31			0.14	0.04	0.21			0.25		0.04
v/c Ratio		1.17			0.66	0.14	0.53	1.08		0.64	0.90	0.10
Uniform Delay, d1		37.6			39.6	31.5	21.5	33.1		24.0	31.0	18.0
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		110.5			4.6	0.1	2.6	60.9		9.7	15.7	0.1
Delay (s)		148.1			44.2	31.6	24.0	93.9		33.7	46.8	18.1
Level of Service		F			D	C	C	F		C	D	B
Approach Delay (s)		148.1			37.6			84.0			40.0	
Approach LOS		F			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	68.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	108.5	Sum of lost time (s)	27.0
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	113	76	9	228	193	65	706	11	158	757	118
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1900	1900	1750	1900	1900	1750	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		0.99			1.00	1.00	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		0.97			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected		0.98			1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1750			2467	1599	1703	1648		1718	1667	1502
Flt Permitted		0.41			0.98	1.00	0.11	1.00		0.13	1.00	1.00
Satd. Flow (perm)		726			2423	1599	206	1648		238	1667	1502
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	113	113	76	9	228	193	65	706	11	158	757	118
RTOR Reduction (vph)	0	10	0	0	0	146	0	1	0	0	0	56
Lane Group Flow (vph)	0	292	0	0	237	47	65	716	0	158	757	62
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	5%	5%	5%	1%	1%	1%	6%	6%	0%	5%	5%	5%
Turn Type	pm+pt	NA		custom	NA	custom	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	8				1	5	2		1	6	3
Permitted Phases	8			4	4	4	2	2		6	6	6
Actuated Green, G (s)		31.0			19.4	24.4	49.2	45.2		51.2	46.2	51.8
Effective Green, g (s)		31.0			19.4	24.4	49.2	45.2		51.2	46.2	51.8
Actuated g/C Ratio		0.31			0.20	0.25	0.50	0.46		0.52	0.47	0.52
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		284			473	490	162	750		197	776	875
v/s Ratio Prot		c0.06				0.00	0.02	0.43		c0.04	c0.45	0.00
v/s Ratio Perm		c0.26			0.10	0.02	0.18			0.37		0.04
v/c Ratio		1.03			0.50	0.10	0.40	0.96		0.80	0.98	0.07
Uniform Delay, d1		34.1			35.6	28.9	18.6	26.0		18.9	25.9	11.8
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		61.2			0.8	0.1	1.6	22.3		20.5	26.1	0.0
Delay (s)		95.3			36.4	29.0	20.2	48.4		39.4	52.1	11.8
Level of Service		F			D	C	C	D		D	D	B
Approach Delay (s)		95.3			33.1			46.0			45.5	
Approach LOS		F			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	99.2	Sum of lost time (s)	27.0
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	84	79	19	217	266	112	672	1	89	558	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1750	1900	1900	1750	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97			1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.93			0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1652			1691		1640	1591		1640	1591	1431
Flt Permitted	0.13	1.00			0.98		0.18	1.00		0.10	1.00	1.00
Satd. Flow (perm)	241	1652			1666		307	1591		171	1591	1431
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	149	84	79	19	217	266	112	672	1	89	558	146
RTOR Reduction (vph)	0	27	0	0	33	0	0	0	0	0	0	85
Lane Group Flow (vph)	149	136	0	0	469	0	112	673	0	89	558	61
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	10%	10%	0%	10%	10%	10%
Turn Type	pm+pt	NA		custom	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	8					5	2		1	6	3
Permitted Phases	8	8		4	4		2	2		6	6	6
Actuated Green, G (s)	35.3	35.3			24.3		45.4	40.4		45.4	40.4	45.4
Effective Green, g (s)	35.3	35.3			24.3		45.4	40.4		45.4	40.4	45.4
Actuated g/C Ratio	0.33	0.33			0.22		0.42	0.37		0.42	0.37	0.42
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	147	537			373		189	592		139	592	598
v/s Ratio Prot	c0.05	0.08					0.03	c0.42		c0.03	0.35	0.00
v/s Ratio Perm	0.28				c0.28		0.22			0.24		0.04
v/c Ratio	1.01	0.25			1.26		0.59	1.14		0.64	0.94	0.10
Uniform Delay, d1	35.5	26.9			42.1		22.9	34.0		25.4	32.9	19.2
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	77.9	0.2			136.4		4.9	80.8		9.7	23.6	0.1
Delay (s)	113.3	27.2			178.5		27.9	114.9		35.0	56.5	19.2
Level of Service	F	C			F		C	F		D	E	B
Approach Delay (s)		68.3			178.5			102.5			47.2	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	95.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	108.5	Sum of lost time (s)	27.0
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	113	76	9	228	193	65	706	11	158	757	118
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1900	1900	1750	1900	1900	1750	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98			1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94			0.94		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	1719			2320		1703	1648		1718	1667	1504
Flt Permitted	0.18	1.00			0.99		0.13	1.00		0.14	1.00	1.00
Satd. Flow (perm)	329	1719			2301		229	1648		259	1667	1504
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	113	113	76	9	228	193	65	706	11	158	757	118
RTOR Reduction (vph)	0	19	0	0	23	0	0	1	0	0	0	52
Lane Group Flow (vph)	113	170	0	0	407	0	65	716	0	158	757	66
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	5%	5%	5%	1%	1%	1%	6%	6%	0%	5%	5%	5%
Turn Type	pm+pt	NA		custom	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	8					5	2		1	6	3
Permitted Phases	8			4	4		2	2		6	6	6
Actuated Green, G (s)	29.8	29.8			16.0		50.2	46.2		52.2	47.2	55.0
Effective Green, g (s)	29.8	29.8			16.0		50.2	46.2		52.2	47.2	55.0
Actuated g/C Ratio	0.30	0.30			0.16		0.51	0.47		0.53	0.48	0.56
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	208	517			371		175	769		210	794	926
v/s Ratio Prot	c0.04	0.10					0.01	0.43		c0.04	c0.45	0.01
v/s Ratio Perm	0.12				c0.18		0.17			0.36		0.04
v/c Ratio	0.54	0.33			1.10		0.37	0.93		0.75	0.95	0.07
Uniform Delay, d1	27.6	26.8			41.5		17.7	24.9		18.0	24.8	10.2
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.9	0.4			75.0		1.3	17.9		14.1	21.2	0.0
Delay (s)	30.5	27.2			116.5		19.1	42.8		32.1	46.1	10.2
Level of Service	C	C			F		B	D		C	D	B
Approach Delay (s)		28.5			116.5			40.8			39.8	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM 2000 Control Delay	51.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	99.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	99.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	84	79	19	217	266	112	672	1	89	558	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1750	1900	1900	1750	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97			1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.93			1.00	0.85	1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1643			1811	1553	1641	1591		1640	1533	
Flt Permitted	0.21	1.00			0.96	1.00	0.14	1.00		0.17	1.00	
Satd. Flow (perm)	379	1643			1743	1553	243	1591		288	1533	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	149	84	79	19	217	266	112	672	1	89	558	146
RTOR Reduction (vph)	0	27	0	0	0	216	0	0	0	0	7	0
Lane Group Flow (vph)	149	136	0	0	236	50	112	673	0	89	697	0
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	10%	10%	0%	10%	10%	10%
Turn Type	pm+pt	NA		custom	NA	custom	pm+pt	NA		pm+pt	NA	
Protected Phases	3	8				1	5	2		1	6	
Permitted Phases	8	8		4	4	4	2	2		6	6	
Actuated Green, G (s)	26.3	26.3			15.3	20.3	54.5	49.5		54.5	49.5	
Effective Green, g (s)	26.3	26.3			15.3	20.3	54.5	49.5		54.5	49.5	
Actuated g/C Ratio	0.24	0.24			0.14	0.19	0.50	0.46		0.50	0.46	
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	154	397			245	376	186	725		206	698	
v/s Ratio Prot	c0.04	0.08				0.01	c0.03	0.42		0.02	c0.45	
v/s Ratio Perm	c0.19				0.14	0.03	0.27			0.20		
v/c Ratio	0.97	0.34			0.96	0.13	0.60	0.93		0.43	1.00	
Uniform Delay, d1	39.7	34.0			46.4	36.8	20.1	27.9		18.8	29.5	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	62.1	0.5			47.0	0.2	5.4	18.0		1.5	33.4	
Delay (s)	101.8	34.5			93.3	37.0	25.5	45.9		20.2	62.9	
Level of Service	F	C			F	D	C	D		C	E	
Approach Delay (s)		66.7			63.5			43.0			58.1	
Approach LOS		E			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	55.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	108.6	Sum of lost time (s)	27.0
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	113	76	9	228	193	65	706	11	158	757	118
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1900	1900	1750	1900	1900	1750	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98			1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.94			1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1716			2465	1599	1703	1648		1718	1627	
Flt Permitted	0.21	1.00			0.98	1.00	0.08	1.00		0.16	1.00	
Satd. Flow (perm)	383	1716			2422	1599	149	1648		291	1627	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	113	113	76	9	228	193	65	706	11	158	757	118
RTOR Reduction (vph)	0	19	0	0	0	156	0	1	0	0	4	0
Lane Group Flow (vph)	113	170	0	0	237	37	65	716	0	158	871	0
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	5%	5%	5%	1%	1%	1%	6%	6%	0%	5%	5%	5%
Turn Type	pm+pt	NA		custom	NA	custom	pm+pt	NA		pm+pt	NA	
Protected Phases	3	8				1	5	2		1	6	
Permitted Phases	8			4	4	4	2	2		6	6	
Actuated Green, G (s)	26.8	26.8			12.9	18.9	52.2	48.2		56.2	50.2	
Effective Green, g (s)	26.8	26.8			12.9	18.9	52.2	48.2		56.2	50.2	
Actuated g/C Ratio	0.27	0.27			0.13	0.19	0.53	0.49		0.57	0.51	
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	210	464			315	402	141	802		251	825	
v/s Ratio Prot	c0.04	0.10				0.01	0.02	0.43		c0.04	c0.54	
v/s Ratio Perm	0.10				c0.10	0.02	0.22			0.32		
v/c Ratio	0.54	0.37			0.75	0.09	0.46	0.89		0.63	1.06	
Uniform Delay, d1	29.1	29.2			41.5	33.0	19.6	23.1		15.9	24.4	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.6	0.5			9.7	0.1	2.4	12.3		4.9	47.1	
Delay (s)	31.8	29.7			51.2	33.1	22.0	35.4		20.8	71.5	
Level of Service	C	C			D	C	C	D		C	E	
Approach Delay (s)		30.5			43.1			34.3			63.8	
Approach LOS		C			D			C			E	

Intersection Summary			
HCM 2000 Control Delay	47.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	99.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	96.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1	1	8	0	473	6	810	22	51	568	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.95			1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1750			1770	1583	1770	1752		1770	1680	
Flt Permitted		0.89			0.89	1.00	0.45	1.00		0.14	1.00	
Satd. Flow (perm)		1576			1656	1583	833	1752		265	1680	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	1	1	8	0	473	6	810	22	51	568	9
RTOR Reduction (vph)	0	1	0	0	0	104	0	1	0	0	0	0
Lane Group Flow (vph)	0	2	0	0	8	369	6	831	0	51	577	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	8%	8%	2%	13%	0%
Parking (#/hr)												0
Turn Type	Perm	NA		Perm	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		4.5			4.5	25.4	57.4	56.6		83.5	76.7	
Effective Green, g (s)		4.5			4.5	25.4	57.4	56.6		83.5	76.7	
Actuated g/C Ratio		0.04			0.04	0.25	0.57	0.57		0.84	0.77	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		70			74	497	485	991		535	1288	
v/s Ratio Prot						c0.15	0.00	c0.47		0.02	0.34	
v/s Ratio Perm		0.00			0.00	0.08	0.01			0.06		
v/c Ratio		0.03			0.11	0.74	0.01	0.84		0.10	0.45	
Uniform Delay, d1		45.7			45.8	34.3	9.1	17.9		8.9	4.1	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.6	5.9	0.0	8.5		0.1	1.1	
Delay (s)		45.8			46.5	40.2	9.1	26.4		9.0	5.3	
Level of Service		D			D	D	A	C		A	A	
Approach Delay (s)		45.8			40.3			26.3			5.6	
Approach LOS		D			D			C			A	

Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	91.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	23	46	478	48	154	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	23	46	478	48	154	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1102	
pX, platoon unblocked						
vC, conflicting volume	1162	158	163			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1162	158	163			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	84	95	66			
cM capacity (veh/h)	143	887	1416			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	69	526	163
Volume Left	23	478	0
Volume Right	46	0	9
cSH	324	1416	1700
Volume to Capacity	0.21	0.34	0.10
Queue Length 95th (ft)	20	38	0
Control Delay (s)	19.1	8.3	0.0
Lane LOS	C	A	
Approach Delay (s)	19.1	8.3	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	117	76	0	0	0	240	840	18	134	762	153
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1900	1900	1750	1900	1900	1750	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0					6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00					1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98					1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00					1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94					1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	1718					1703	1646		1718	1667	1538
Flt Permitted	0.95	1.00					0.12	1.00		0.22	1.00	1.00
Satd. Flow (perm)	1719	1718					222	1646		399	1667	1538
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	113	117	76	0	0	0	240	840	18	134	762	153
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	0	0	0	50
Lane Group Flow (vph)	113	174	0	0	0	0	240	858	0	134	762	103
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	5%	5%	5%	1%	1%	1%	6%	6%	0%	5%	5%	5%
Turn Type	pm+pt	NA					pm+pt	NA		pm+pt	NA	pt+ov
Protected Phases	3	8					5	2		1	6	3 6
Permitted Phases	8	8					2			6		
Actuated Green, G (s)	15.3	15.3					71.1	71.1		65.1	65.1	80.4
Effective Green, g (s)	15.3	15.3					71.1	71.1		65.1	65.1	80.4
Actuated g/C Ratio	0.13	0.13					0.59	0.59		0.54	0.54	0.67
Clearance Time (s)	6.0	6.0					6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	219	219					267	975		271	904	1030
v/s Ratio Prot	0.07	c0.10					0.08	c0.52		0.02	c0.46	0.07
v/s Ratio Perm							c0.45			0.25		
v/c Ratio	0.52	0.79					0.90	0.88		0.49	0.84	0.10
Uniform Delay, d1	48.9	50.8					24.2	20.8		31.0	23.1	7.0
Progression Factor	1.00	1.00					1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.0	17.7					29.8	11.2		1.4	9.4	0.0
Delay (s)	50.9	68.5					54.0	32.0		32.4	32.6	7.0
Level of Service	D	E					D	C		C	C	A
Approach Delay (s)		62.0			0.0			36.8			28.8	
Approach LOS		E			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	4	1	25	3	333	3	811	53	64	797	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1806			1766	1568	1770	1846		1752	1842	
Flt Permitted		0.94			0.86	1.00	0.34	1.00		0.20	1.00	
Satd. Flow (perm)		1702			1587	1568	639	1846		369	1842	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	4	1	25	3	333	3	811	53	64	797	8
RTOR Reduction (vph)	0	1	0	0	0	157	0	2	0	0	0	0
Lane Group Flow (vph)	0	5	0	0	28	176	3	862	0	64	805	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	3%	3%	0%
Parking (#/hr)												0
Turn Type	Perm	NA		Perm	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		4.4			4.4	14.9	68.1	67.1		83.6	76.6	
Effective Green, g (s)		4.4			4.4	14.9	68.1	67.1		83.6	76.6	
Actuated g/C Ratio		0.04			0.04	0.15	0.68	0.67		0.84	0.77	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		74			69	327	446	1238		453	1410	
v/s Ratio Prot						c0.06	0.00	c0.47		0.01	c0.44	
v/s Ratio Perm		0.00			0.02	0.06	0.00			0.10		
v/c Ratio		0.07			0.41	0.54	0.01	0.70		0.14	0.57	
Uniform Delay, d1		45.8			46.5	39.4	5.2	10.2		6.5	4.9	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			3.9	1.7	0.0	3.3		0.1	1.7	
Delay (s)		46.2			50.4	41.1	5.2	13.4		6.7	6.5	
Level of Service		D			D	D	A	B		A	A	
Approach Delay (s)		46.2			41.8			13.4			6.6	
Approach LOS		D			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	53	51	310	51	362	34
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	53	51	310	51	362	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1102	
pX, platoon unblocked						
vC, conflicting volume	1050	379	396			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1050	379	396			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	71	92	73			
cM capacity (veh/h)	185	668	1168			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	104	361	396
Volume Left	53	310	0
Volume Right	51	0	34
cSH	286	1168	1700
Volume to Capacity	0.36	0.27	0.23
Queue Length 95th (ft)	40	27	0
Control Delay (s)	24.6	8.2	0.0
Lane LOS	C	A	
Approach Delay (s)	24.6	8.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	6.4		
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	86	79	13	0	18	342	899	3	75	558	146
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1000	1900	1750	1900	1900	1750	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98			1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.93		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.93			0.92		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1709			2018		1640	1590		1640	1591	1468
Flt Permitted	0.59	1.00			0.95		0.17	1.00		0.13	1.00	1.00
Satd. Flow (perm)	1084	1709			1950		285	1590		218	1591	1468
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	149	86	79	13	0	18	342	899	3	75	558	146
RTOR Reduction (vph)	0	33	0	0	30	0	0	0	0	0	0	72
Lane Group Flow (vph)	149	132	0	0	1	0	342	902	0	75	558	74
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	10%	10%	0%	10%	10%	10%
Turn Type	custom	NA		custom	NA		pm+pt	NA		pm+pt	NA	pt+ov
Protected Phases	3						5	2		1	6	3 6
Permitted Phases	8	8		4	4		2			6		
Actuated Green, G (s)	15.7	15.7			3.0		51.7	51.7		43.7	43.7	50.4
Effective Green, g (s)	15.7	15.7			3.0		51.7	51.7		43.7	43.7	50.4
Actuated g/C Ratio	0.16	0.16			0.03		0.52	0.52		0.44	0.44	0.50
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	213	268			58		309	822		152	695	739
v/s Ratio Prot	c0.05						0.13	c0.57		0.02	c0.35	0.05
v/s Ratio Perm	c0.06	0.08			0.00		c0.44			0.20		
v/c Ratio	0.70	0.49			0.02		1.11	1.10		0.49	0.80	0.10
Uniform Delay, d1	39.7	38.5			47.1		21.4	24.1		37.6	24.4	13.0
Progression Factor	1.00	1.00			1.00		1.41	1.29		1.00	1.00	1.00
Incremental Delay, d2	9.6	1.4			0.1		69.5	54.8		2.5	9.5	0.1
Delay (s)	49.3	39.9			47.2		99.7	85.8		40.1	33.9	13.0
Level of Service	D	D			D		F	F		D	C	B
Approach Delay (s)		44.4			47.2			89.6			30.6	
Approach LOS		D			D			F			C	

Intersection Summary			
HCM 2000 Control Delay	63.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	117	76	13	70	20	205	840	18	134	749	118
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1900	1900	1750	1900	1900	1750	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98			1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.99		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94			0.97		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	1727			2371		1703	1646		1719	1667	1538
Flt Permitted	0.33	1.00			0.92		0.10	1.00		0.10	1.00	1.00
Satd. Flow (perm)	603	1727			2196		187	1646		188	1667	1538
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	113	117	76	13	70	20	205	840	18	134	749	118
RTOR Reduction (vph)	0	24	0	0	8	0	0	1	0	0	0	59
Lane Group Flow (vph)	113	169	0	0	95	0	205	857	0	134	749	59
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	5%	5%	5%	1%	1%	1%	6%	6%	0%	5%	5%	5%
Turn Type	pm+pt	NA		custom	NA		pm+pt	NA		pm+pt	NA	pt+ov
Protected Phases	3	8					5	2		1	6	3 6
Permitted Phases	8	8		4	4		2			6		
Actuated Green, G (s)	18.0	18.0			6.0		47.4	47.4		44.4	44.4	50.4
Effective Green, g (s)	18.0	18.0			6.0		47.4	47.4		44.4	44.4	50.4
Actuated g/C Ratio	0.18	0.18			0.06		0.47	0.47		0.44	0.44	0.50
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	175	310			131		225	780		175	740	775
v/s Ratio Prot	0.04	c0.10					0.08	c0.52		0.05	c0.45	0.04
v/s Ratio Perm	c0.08				0.04		0.35			0.29		
v/c Ratio	0.65	0.55			0.72		0.91	1.10		0.77	1.01	0.08
Uniform Delay, d1	36.3	37.3			46.2		24.5	26.3		39.5	27.8	12.8
Progression Factor	1.00	1.00			1.00		1.10	1.09		1.00	1.00	1.00
Incremental Delay, d2	7.9	2.0			17.7		31.5	59.4		17.9	36.1	0.0
Delay (s)	44.3	39.2			63.9		58.4	88.2		57.4	63.9	12.8
Level of Service	D	D			E		E	F		E	E	B
Approach Delay (s)		41.1			63.9			82.4			57.0	
Approach LOS		D			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	66.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	84	79	0	0	266	329	672	1	89	558	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1750	1900	1900	1750	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0				6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00				1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97				1.00	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00				1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.93				0.86	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00				1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1693				1580	1641	1591		1639	1591	1444
Flt Permitted	0.95	1.00				1.00	0.14	1.00		0.21	1.00	1.00
Satd. Flow (perm)	1736	1693				1580	249	1591		365	1591	1444
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	149	84	79	0	0	266	329	672	1	89	558	146
RTOR Reduction (vph)	0	30	0	0	0	225	0	0	0	0	0	62
Lane Group Flow (vph)	149	133	0	0	0	41	329	673	0	89	558	84
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	10%	10%	0%	10%	10%	10%
Turn Type	Prot	NA				custom	pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8				1 4	5	2		1	6	3 8
Permitted Phases							2			6		6
Actuated Green, G (s)	10.9	21.1				15.3	55.6	44.5		40.5	35.4	56.5
Effective Green, g (s)	10.9	21.1				15.3	55.6	44.5		40.5	35.4	56.5
Actuated g/C Ratio	0.11	0.21				0.16	0.57	0.45		0.41	0.36	0.57
Clearance Time (s)	6.0	6.0					6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	192	363				245	341	719		216	572	829
v/s Ratio Prot	c0.09	c0.08				0.03	c0.14	c0.42		0.02	0.35	0.02
v/s Ratio Perm							c0.41			0.15		0.04
v/c Ratio	0.78	0.37				0.17	0.96	0.94		0.41	0.98	0.10
Uniform Delay, d1	42.6	33.0				36.0	23.9	25.6		19.7	31.1	9.5
Progression Factor	1.00	1.00				1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	17.6	0.6				0.3	39.1	19.4		1.3	31.2	0.1
Delay (s)	60.2	33.6				36.4	63.0	45.0		21.0	62.2	9.5
Level of Service	E	C				D	E	D		C	E	A
Approach Delay (s)		46.3			36.4			50.9			47.9	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	98.4	Sum of lost time (s)	27.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	1	1	17	0	220	6	811	19	51	561	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	1	1	17	0	220	6	811	19	51	561	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											927	
pX, platoon unblocked	0.70	0.70	0.70	0.70	0.70		0.70					
vC, conflicting volume	1720	1510	566	1502	1504	820	570			830		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1815	1514	162	1502	1506	820	168			830		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	99	100	74	100	41	99			94		
cM capacity (veh/h)	16	78	617	65	79	375	984			802		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	3	17	220	836	621
Volume Left	1	17	0	6	51
Volume Right	1	0	220	19	9
cSH	40	65	375	984	802
Volume to Capacity	0.08	0.26	0.59	0.01	0.06
Queue Length 95th (ft)	6	23	90	0	5
Control Delay (s)	102.4	78.3	27.4	0.2	1.7
Lane LOS	F	F	D	A	A
Approach Delay (s)	102.4	31.0		0.2	1.7
Approach LOS	F	D			

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	20	46	233	293	150	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	46	233	293	150	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1102	
pX, platoon unblocked						
vC, conflicting volume	911	152	154			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	911	152	154			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	95	84			
cM capacity (veh/h)	255	894	1426			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	66	526	154
Volume Left	20	233	0
Volume Right	46	0	4
cSH	508	1426	1700
Volume to Capacity	0.13	0.16	0.09
Queue Length 95th (ft)	11	15	0
Control Delay (s)	13.1	4.4	0.0
Lane LOS	B	A	
Approach Delay (s)	13.1	4.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	113	76	0	0	189	271	706	11	158	757	118
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1900	1900	1750	1900	1900	1750	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0				6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00				1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98				1.00	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00				1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94				0.86	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00				1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	1718				1627	1703	1648		1718	1667	1508
Flt Permitted	0.95	1.00				1.00	0.13	1.00		0.20	1.00	1.00
Satd. Flow (perm)	1719	1718				1627	228	1648		370	1667	1508
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	113	113	76	0	0	189	271	706	11	158	757	118
RTOR Reduction (vph)	0	21	0	0	0	174	0	0	0	0	0	44
Lane Group Flow (vph)	113	168	0	0	0	15	271	717	0	158	757	74
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	5%	5%	5%	1%	1%	1%	6%	6%	0%	5%	5%	5%
Turn Type	Prot	NA				custom	pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8				1 4	5	2		1	6	3 8
Permitted Phases							2			6		6
Actuated Green, G (s)	15.0	15.0				8.2	65.3	54.1		59.3	51.1	66.1
Effective Green, g (s)	15.0	15.0				8.2	65.3	54.1		59.3	51.1	66.1
Actuated g/C Ratio	0.14	0.14				0.08	0.62	0.52		0.57	0.49	0.63
Clearance Time (s)	6.0	6.0					6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	246	246				127	299	851		315	813	952
v/s Ratio Prot	0.07	c0.10				0.01	c0.10	0.43		0.04	0.45	0.01
v/s Ratio Perm							c0.47			0.24		0.04
v/c Ratio	0.46	0.68				0.12	0.91	0.84		0.50	0.93	0.08
Uniform Delay, d1	41.1	42.6				44.9	22.7	21.6		14.5	25.1	7.5
Progression Factor	1.00	1.00				1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	7.7				0.4	29.0	7.6		1.3	17.1	0.0
Delay (s)	42.5	50.3				45.3	51.7	29.2		15.8	42.3	7.5
Level of Service	D	D				D	D	C		B	D	A
Approach Delay (s)		47.4			45.3			35.4			34.2	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	37.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	104.7	Sum of lost time (s)	27.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	4	1	36	3	211	3	810	46	64	801	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	4	1	36	3	211	3	810	46	64	801	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											927	
pX, platoon unblocked	0.59	0.59	0.59	0.59	0.59		0.59					
vC, conflicting volume	1962	1795	805	1771	1776	833	809			856		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2287	2003	314	1962	1971	833	321			856		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	87	100	0	91	43	100			92		
cM capacity (veh/h)	6	32	426	23	33	367	726			780		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	6	39	211	3	856	64	809
Volume Left	1	36	0	3	0	64	0
Volume Right	1	0	211	0	46	0	8
cSH	20	24	367	726	1700	780	1700
Volume to Capacity	0.29	1.63	0.57	0.00	0.50	0.08	0.48
Queue Length 95th (ft)	21	122	86	0	0	7	0
Control Delay (s)	242.5	660.8	27.3	10.0	0.0	10.0	0.0
Lane LOS	F	F	D	A		B	
Approach Delay (s)	242.5	126.1		0.0		0.7	
Approach LOS	F	F					

Intersection Summary			
Average Delay	16.9		
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	46	51	211	150	354	39
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	46	51	211	150	354	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1102	
pX, platoon unblocked						
vC, conflicting volume	946	374	393			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	946	374	393			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	81	92	82			
cM capacity (veh/h)	238	673	1171			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	97	361	393
Volume Left	46	211	0
Volume Right	51	0	39
cSH	361	1171	1700
Volume to Capacity	0.27	0.18	0.23
Queue Length 95th (ft)	27	16	0
Control Delay (s)	18.6	5.8	0.0
Lane LOS	C	A	
Approach Delay (s)	18.6	5.8	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	84	79	19	217	266	112	672	1	89	558	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1750	1900	1900	1750	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97			1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.93			1.00	0.85	1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1643			1811	1553	1641	1591		1640	1533	
Flt Permitted	0.21	1.00			0.96	1.00	0.14	1.00		0.17	1.00	
Satd. Flow (perm)	379	1643			1743	1553	243	1591		288	1533	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	149	84	79	19	217	266	112	672	1	89	558	146
RTOR Reduction (vph)	0	27	0	0	0	216	0	0	0	0	7	0
Lane Group Flow (vph)	149	136	0	0	236	50	112	673	0	89	697	0
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	10%	10%	0%	10%	10%	10%
Turn Type	pm+pt	NA		custom	NA	custom	pm+pt	NA		pm+pt	NA	
Protected Phases	3	8				1	5	2		1	6	
Permitted Phases	8	8		4	4	4	2	2		6	6	
Actuated Green, G (s)	26.3	26.3			15.3	20.3	54.5	49.5		54.5	49.5	
Effective Green, g (s)	26.3	26.3			15.3	20.3	54.5	49.5		54.5	49.5	
Actuated g/C Ratio	0.24	0.24			0.14	0.19	0.50	0.46		0.50	0.46	
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	154	397			245	376	186	725		206	698	
v/s Ratio Prot	c0.04	0.08				0.01	c0.03	0.42		0.02	c0.45	
v/s Ratio Perm	c0.19				0.14	0.03	0.27			0.20		
v/c Ratio	0.97	0.34			0.96	0.13	0.60	0.93		0.43	1.00	
Uniform Delay, d1	39.7	34.0			46.4	36.8	20.1	27.9		18.8	29.5	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	62.1	0.5			47.0	0.2	5.4	18.0		1.5	33.4	
Delay (s)	101.8	34.5			93.3	37.0	25.5	45.9		20.2	62.9	
Level of Service	F	C			F	D	C	D		C	E	
Approach Delay (s)		66.7			63.5			43.0			58.1	
Approach LOS		E			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	55.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	108.6	Sum of lost time (s)	27.0
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	113	76	9	228	193	65	706	11	158	757	118
Ideal Flow (vphpl)	1900	1900	1900	1900	2500	1900	1900	1750	1900	1900	1750	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98			1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.94			1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1716			2465	1599	1703	1648		1718	1627	
Flt Permitted	0.21	1.00			0.98	1.00	0.08	1.00		0.16	1.00	
Satd. Flow (perm)	383	1716			2422	1599	149	1648		291	1627	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	113	113	76	9	228	193	65	706	11	158	757	118
RTOR Reduction (vph)	0	19	0	0	0	156	0	1	0	0	4	0
Lane Group Flow (vph)	113	170	0	0	237	37	65	716	0	158	871	0
Confl. Peds. (#/hr)			21	21			7		18	18		7
Heavy Vehicles (%)	5%	5%	5%	1%	1%	1%	6%	6%	0%	5%	5%	5%
Turn Type	pm+pt	NA		custom	NA	custom	pm+pt	NA		pm+pt	NA	
Protected Phases	3	8				1	5	2		1	6	
Permitted Phases	8			4	4	4	2	2		6	6	
Actuated Green, G (s)	26.8	26.8			12.9	18.9	52.2	48.2		56.2	50.2	
Effective Green, g (s)	26.8	26.8			12.9	18.9	52.2	48.2		56.2	50.2	
Actuated g/C Ratio	0.27	0.27			0.13	0.19	0.53	0.49		0.57	0.51	
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	210	464			315	402	141	802		251	825	
v/s Ratio Prot	c0.04	0.10				0.01	0.02	0.43		c0.04	c0.54	
v/s Ratio Perm	0.10				c0.10	0.02	0.22			0.32		
v/c Ratio	0.54	0.37			0.75	0.09	0.46	0.89		0.63	1.06	
Uniform Delay, d1	29.1	29.2			41.5	33.0	19.6	23.1		15.9	24.4	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.6	0.5			9.7	0.1	2.4	12.3		4.9	47.1	
Delay (s)	31.8	29.7			51.2	33.1	22.0	35.4		20.8	71.5	
Level of Service	C	C			D	C	C	D		C	E	
Approach Delay (s)		30.5			43.1			34.3			63.8	
Approach LOS		C			D			C			E	

Intersection Summary			
HCM 2000 Control Delay	47.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	99.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	96.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Traffic Signal WARRANTS ANALYSIS Summary Sheet

STANTEC

Location : Church Street at Shelburne Road US 7 Shelburne, VT — Project 195310774 — Prepared by: DJD — Date: 3/28/2013

Conclusion :Thresholds met for Four hour Warrant 2 (Four-Hour Vehicular Volume) and Warrant 3 (Peak Hour).

IMPROVEMENTS STRATEGY 2 - Church St (1 lane)

Speed Limit: 30 mph — Volumes: 6 / 6 / 2012 count

Warrant 1, Eight- Hour Vehicular Volume:

				Minimum*
Warrant 1A	MINIMUM VEHICULAR VOLUME			
	Major Street :	(500 or 600 with 1 or 2 lanes)	1 Lane(s) on each approach	500
	Minor Street :	(150 or 200 with 1 or 2 lanes)	1 Lane(s) on each approach	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC			
	Major Street :	(750 or 900 with 1 or 2 lanes)	1 Lane(s) on each approach	750
	Minor Street :	(75 or 100 with 1 or 2 lanes)	1 Lane(s) on each approach	75
Warrant 1A\1B	COMBINED WARRANT 1A AND WARRANT 1B (See Condition Percentages)			
	Major Street :		1 Lane(s) on each approach	NA
	Minor Street :		1 Lane(s) on each approach	NA

Warrant 2, Four-Hour Vehicular Volume

		Minimum*
Major Street (2 approaches	1 Lane(s) per approach	1000
Minor Street (highest) :	1 Lane(s) per approach	100

Warrant 3, Peak-Hour Vehicular Volume

Major Street (2 approaches	1 Lane(s) per approach	1000
Minor Street (highest) :	1 Lane(s) per approach	200

Warrants 1A, 1B, 1C, 2, 3:

Study Hours	Highest Entering Volume on Minor Road (Church Street) WB Lefts	WB thru	WB Rights	Tot. Ent. Vol. On Minor Rd	Entering Volume on Major Road (US 7) NB	SB	Tot. Ent. Vol. On Major Rd	Ped Volumes Across	Ped Volumes Across	Meets the following warrants? 1A	1B	% (1A\1B)	2	3
7:00 - 8:00 AM	5	1	289	295	517	573	1090			Yes	Yes	NA	No	
8:00 - 9:00 AM	8	1	308	317	634	584	1218	NA	NA	Yes	Yes	NA	No	No
9:00 - 10:00 AM				0			0	NA	NA	No	No	NA	No	No
10:00 - 11:00 AM				0			0	NA	NA	No	No	NA	No	No
11:00 - 12:00 PM				0			0	NA	NA	No	No	NA	No	No
12:00 - 1:00 PM				0			0	NA	NA	No	No	NA	No	No
1:00 - 2:00 PM				0			0	NA	NA	No	No	NA	No	No
2:00 - 3:00 PM	11	1	254	266	630	525	1155	NA	NA	Yes	Yes	NA	Yes	Yes
3:00 - 4:00 PM	7	1	271	279	597	612	1209	NA	NA	Yes	Yes	NA	Yes	Yes
4:00 - 5:00 PM	5	1	245	251	713	636	1349	NA	NA	Yes	Yes	NA	Yes	Yes
5:00 - 6:00 PM	7	1	290	298	770	556	1326	NA	NA	Yes	Yes	NA	Yes	Yes
6:00 - 7:00 PM				0			0	NA	NA	No	No	NA	No	No
										6 yes	6 yes	NA	Yes	Yes
											1		2	3
								Are Warrants met?			6 of 8 yes		Yes	Yes

Warrant 4, Four Hours with Minimum Pedestrian Volume of 100: No
Peak Four Hour Pedestrian Volumes:
(across major road)

Warrant 5, School Crossing No

Warrant 7, Crash Experience NA
accidents signalization would
mitigate per year (Avg =5) + % vol.

Warrant 6, Coordinated Signal System: N/A

Warrant 8, Roadway Network: N/A

Condition	Percentages	
a	**100%**	Basic minimum hourly volume
b	**80%**	Warrant 1 combination after all other measures
c	**70%**	Speeds > 40 mph or isolated pop. < 10,000
d	**56%**	c after all other measures

Source: MUTCD. 2009 Edition

Traffic Signal WARRANTS ANALYSIS Summary Sheet

STANTEC

Location : **Church Street at Shelburne Road US 7 Shelburne, VT**

Project 195310774 | Prepared by: DJD | Date: 3/28/2013

Conclusion :Thresholds are met for Four hour Warrant 2 (Four-Hour Vehicular Volume) and Warrant 3 (Peak Hour).

IMPROVEMENTS STRATEGY 3 - Church St (2 lanes)

Speed Limit: 30 mph **Volumes: 6 / 6 / 2012** count

Warrant 1, Eight- Hour Vehicular Volume:

				Minimum*
Warrant 1A	MINIMUM VEHICULAR VOLUME			
	Major Street :	(500 or 600 with 1 or 2 lanes)	1 Lane(s) on each approach	500
	Minor Street :	(150 or 200 with 1 or 2 lanes)	2 Lane(s) on each approach	200
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC			
	Major Street :	(750 or 900 with 1 or 2 lanes)	1 Lane(s) on each approach	750
	Minor Street :	(75 or 100 with 1 or 2 lanes)	2 Lane(s) on each approach	100
Warrant 1A\1B	COMBINED WARRANT 1A AND WARRANT 1B (See Condition Percentages)			
	Major Street :		1 Lane(s) on each approach	NA
	Minor Street :		2 Lane(s) on each approach	NA

Warrant 2, Four-Hour Vehicular Volume

		Minimum*
Major Street (2 approaches	1 Lane(s) per approach	1000
Minor Street (highest) :	2 Lane(s) per approach	150

Warrant 3, Peak-Hour Vehicular Volume

Major Street (2 approaches	1 Lane(s) per approach	1000
Minor Street (highest) :	2 Lane(s) per approach	290

Warrants 1A, 1B, 1C, 2, 3:

Study Hours	Highest Entering Volume on Minor Road (**Church Street**) WB Lefts	WB thru	WB Rights	Tot. Ent. Vol. On Minor Rd	Entering Volume on Major Road (**US 7**) NB	SB	Tot. Ent. Vol. On Major Rd	Ped Volumes Across	Ped Volumes Across	Meets the following warrants? 1A	1B	% (1A\1B)	2	3
7:00 - 8:00 AM	5	1	289	295	517	573	1090			Yes	Yes	NA	Yes	Yes
8:00 - 9:00 AM	8	1	308	317	634	584	1218	NA	NA	Yes	Yes	NA	Yes	Yes
9:00 - 10:00 AM				0			0	NA	NA	No	No	NA	No	No
10:00 - 11:00 AM				0			0	NA	NA	No	No	NA	No	No
11:00 - 12:00 PM				0			0	NA	NA	No	No	NA	No	No
12:00 - 1:00 PM				0			0	NA	NA	No	No	NA	No	No
1:00 - 2:00 PM				0			0	NA	NA	No	No	NA	No	No
2:00 - 3:00 PM	11	1	254	266	630	525	1155	NA	NA	Yes	Yes	NA	Yes	No
3:00 - 4:00 PM	7	1	271	279	597	612	1209	NA	NA	Yes	Yes	NA	Yes	No
4:00 - 5:00 PM	5	1	245	251	713	636	1349	NA	NA	Yes	Yes	NA	Yes	No
5:00 - 6:00 PM	7	1	290	298	770	556	1326	NA	NA	Yes	Yes	NA	Yes	Yes
6:00 - 7:00 PM				0			0	NA	NA	No	No	NA	No	No
										6 yes	6 yes	NA	Yes	Yes
											1		2	3
								Are Warrants met?			6 of 8 yes		Yes	Yes

Warrant 4, Four Hours with Minimum Pedestrian Volume of 100: No
Peak Four Hour Pedestrian Volumes:
(across major road)

Warrant 5, School Crossing No

Warrant 7, Crash Experience NA
accidents signalization would mitigate per year (Avg =5) + % vol.

Warrant 6, Coordinated Signal System: N/A

Warrant 8, Roadway Network: N/A

Condition	Percentages	
a	**100%**	Basic minimum hourly volume
b	**80%**	Warrant 1 combination after all other measures
c	**70%**	Speeds > 40 mph or isolated pop. < 10,000
d	**56%**	c after all other measures

Source: MUTCD. 2009 Edition