

# Technical Assistance Report

## Park and Ride Feasibility Study Charlotte VT - US 7 Corridor



Revised June 2016

Prepared for:  
CCRPC  
Town of Charlotte, Vermont

Prepared by:



28 North Main Street  
Randolph, Vermont 05060  
(802) 728-3376

## About this Report

The preparation of this report has been financed in part through grant[s] from the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation, under the State Planning and Research Program, Section 505 [or Metropolitan Planning Program, Section 104(f)] of Title 23, U.S. Code, as well as matching funds provided by Chittenden County's 18 municipalities and the Vermont Agency of Transportation. The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation.

This work has been guided by the following individuals:

Peter Keating, CCRPC

Dean Bloch and Jeannine McCrumb, Town of Charlotte

Tina Bohl, VTrans

David Armstrong, CCTA

## Introduction

This report has been prepared to explore alternatives and develop recommendations to establish a park and ride lot and CCTA transit stop in Charlotte, VT, in the vicinity of the US 7/Ferry Road intersection. The CCRPC prepared the *Chittenden County Park-and-Ride & Intercept Facility Plan* in 2011, which identified a park and ride along US 7 in Charlotte as a high priority for both ridesharing and CCTA use. While the former train station parking is available for park and ride use, its distance from US 7, lack of pedestrian facilities and lack of visibility make it a poor location for this use. The plan's recommendations for Charlotte are provided below, which resulted in the initiation of this scoping study:

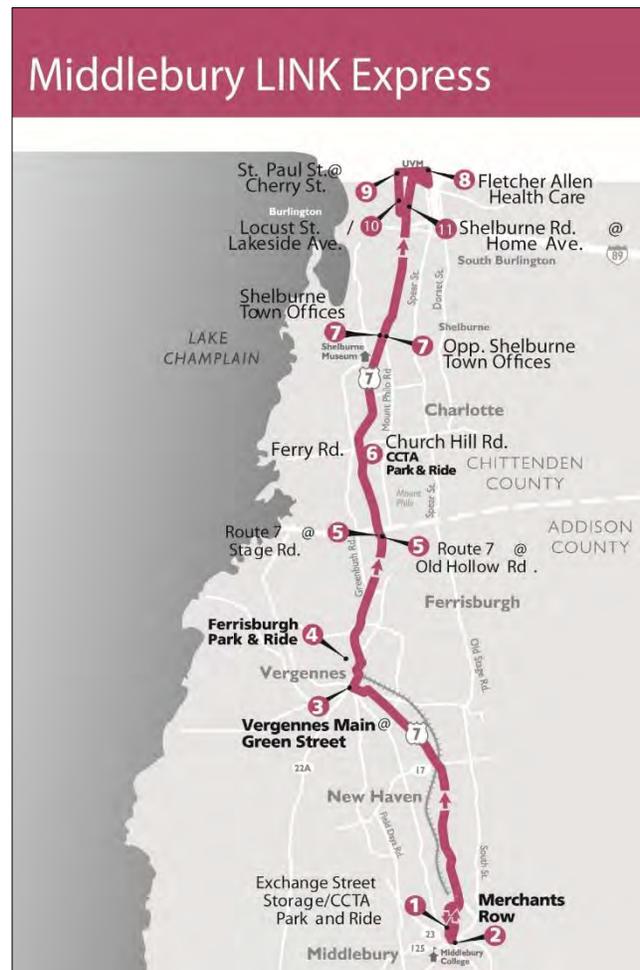
Establish a permanent park-and-ride facility. Although the CITGO station seems to be the preferred site it may not be available as a permanent, long-term location. Other sites should be identified and evaluated so options are available. Conduct scoping study to evaluate alternative sites and select preferred location.

## Existing Conditions

The intersection of US Route 7 and Ferry Road lies just east of the Charlotte's West Village area, about 13 miles south of Burlington and 12 miles north of Vergennes. US Route 7 carries high volumes of traffic, while Ferry Road runs through Charlotte's West Village past several community buildings including the town offices, town library, post office, fire department, daycare, senior center and village store before terminating at a ferry crossing to New York State. Figure 1 shows a base map of the project area.

## Transit Services

There is a transit stop located on the southeast corner of the intersection of US Route 7/Ferry Road/Church Hill Road (see following page) which is serviced by a partnership between the Chittenden County Transportation Authority (CCTA) from Monday through Friday and the Addison County Transit Resources (ACTR) on Saturdays. The stop is part of the Burlington-Middlebury LINK Express Commuter Route. From Monday through Friday, northbound buses make two morning stops, and stop by request in the afternoon and evening. Southbound buses do not stop in the morning and stop in the afternoon by request. On Saturdays, there are four stops over the course of the day in each direction.



# Charlotte Park and Ride Feasibility Study

Figure 1: Study Area Map



## Charlotte Park and Ride Feasibility Study

### Legend

- Contours (2 ft)
- Wetlands
- BuildingFootprints
- Parcels
- Ag Soils

0 0.025 0.05 0.1 0.15 0.2 Miles



### Roadway Network

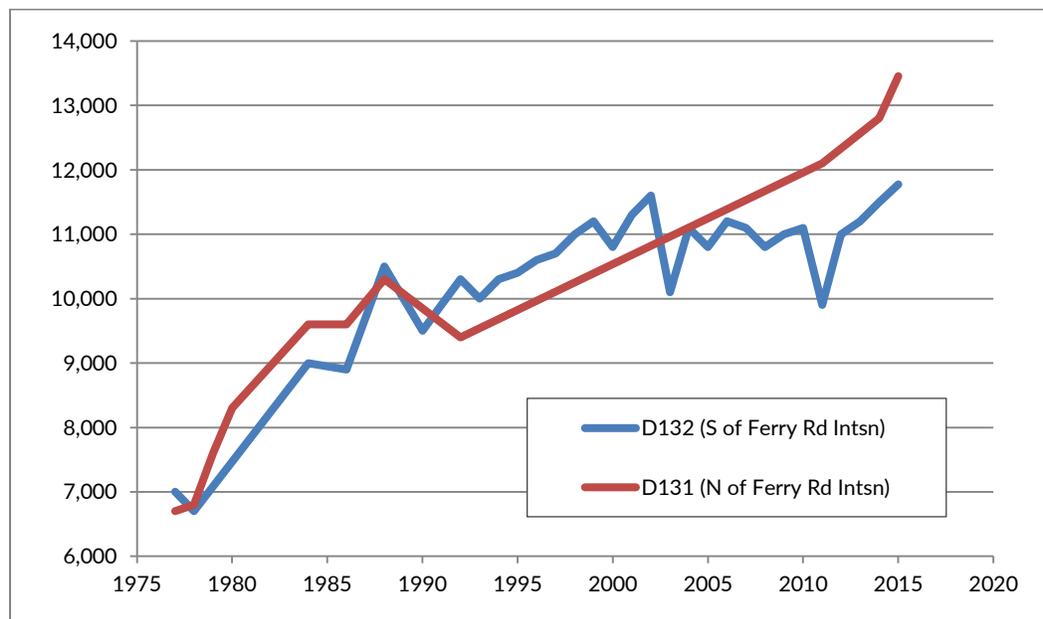
US Route 7 is a principal arterial, and is the primary north-south travel route along the west side of Vermont. In this area, the average annual daily traffic (AADT) is 11,200 vehicles per day. Ferry Road and Church Hill Road are classified as major collectors, under jurisdiction of the Town of Charlotte. The AADT is 1,900 on Church Hill Road, 3,100 on Ferry Road east of Greenbush Road, and 1,700 west of Greenbush Road.

At its intersection with Ferry Road and Church Hill Road, the US Route 7 northbound approach has two lanes: a dedicated left turn lane (525 feet long) and a shared through/right turn lane. The US Route 7 southbound approach has a dedicated right turn lane (200 feet long) and a shared through/left turn lane. Ferry Road and Church Hill Road both have one-lane approaches. The posted speed limit on US Route 7 is 50 mph, while Ferry Road and Church Hill Road have posted speed limits of 25 mph and 35 mph, respectively.

### Traffic and Pedestrian Volumes

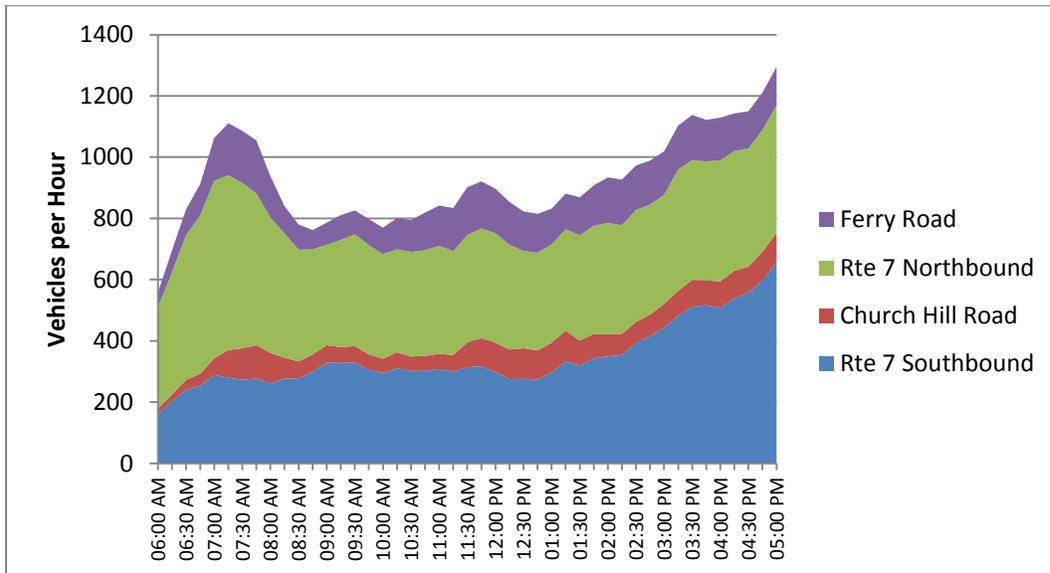
VTrans ATR data has been historically collected at two locations on US 7 in the vicinity of the project location. Figure 2 shows the trends in daily traffic counts (AADT – average annual daily traffic) since 1978. Volumes were relatively stable between 1998 and 2010, and have shown some growth in the most recent counts.

Figure 2: Historical Traffic Volumes (Source: VTrans)

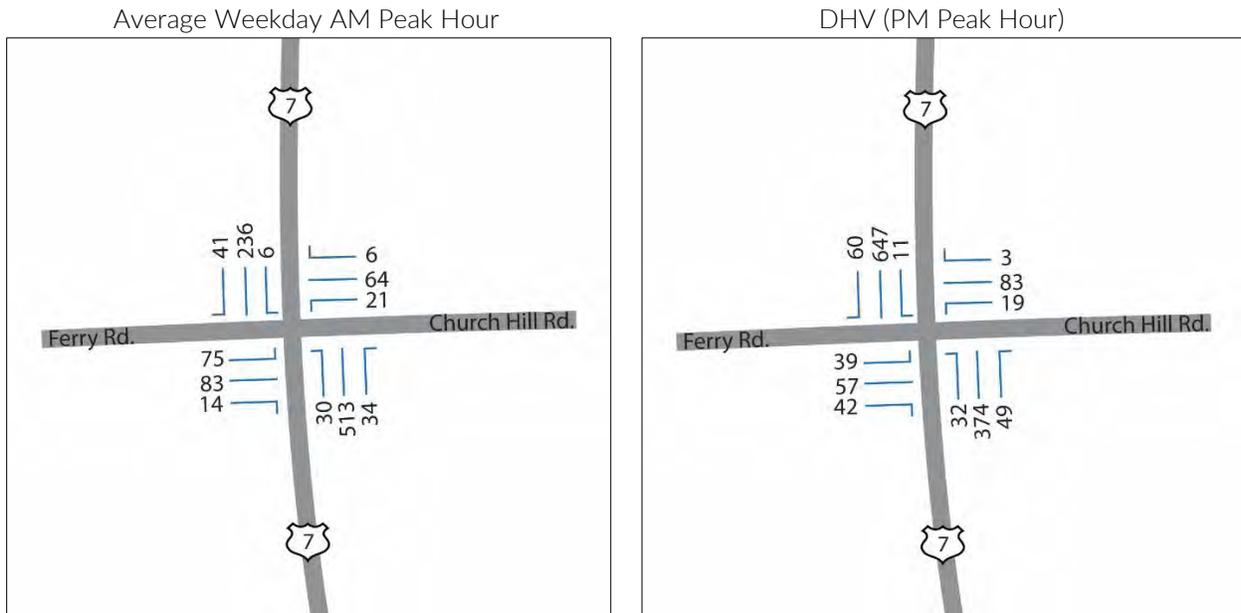


Turning movement traffic counts were conducted by CCRPC on September 21<sup>st</sup>, 2012. Figure 3 shows the traffic count on each intersection approach. There is a morning peak of traffic from 7:00 to 8:00 AM, and an afternoon peak from 5:00 to 6:00.

Figure 3: Hourly Traffic Volumes by Approach



In order to analyze the intersection operations, the count data was adjusted using the nearby continuous counter P6D132, on US Route 7 in Charlotte, to reflect the average weekday morning peak hour, and the 2013 Design Hour Volume (DHV), which is typically an afternoon peak hour. The DHV is traffic volume during the 30<sup>th</sup> highest hour of the year, and is used for traffic analysis and design. The adjusted 2013 AM peak hour and DHV turning movements at the intersection are shown below.



Pedestrians were not counted in the 2012 count, but data is available from a CCRPC count conducted from 7:00 AM to 7:00 PM on July 2<sup>nd</sup>, 2008 show a total of 14 pedestrian crossings.

After adjusting the traffic counts to reflect the 2012 design hour, the vehicular level of service was calculated using Synchro software, with the results summarized below.

**Table 1: Intersection Levels of Service for US 7 – Ferry Road – Church Hill Road**

	LOS	Delay	V/C
2012 AM Peak	B	18.5	0.76
2012 PM Peak	B	17.3	0.75

### Safety

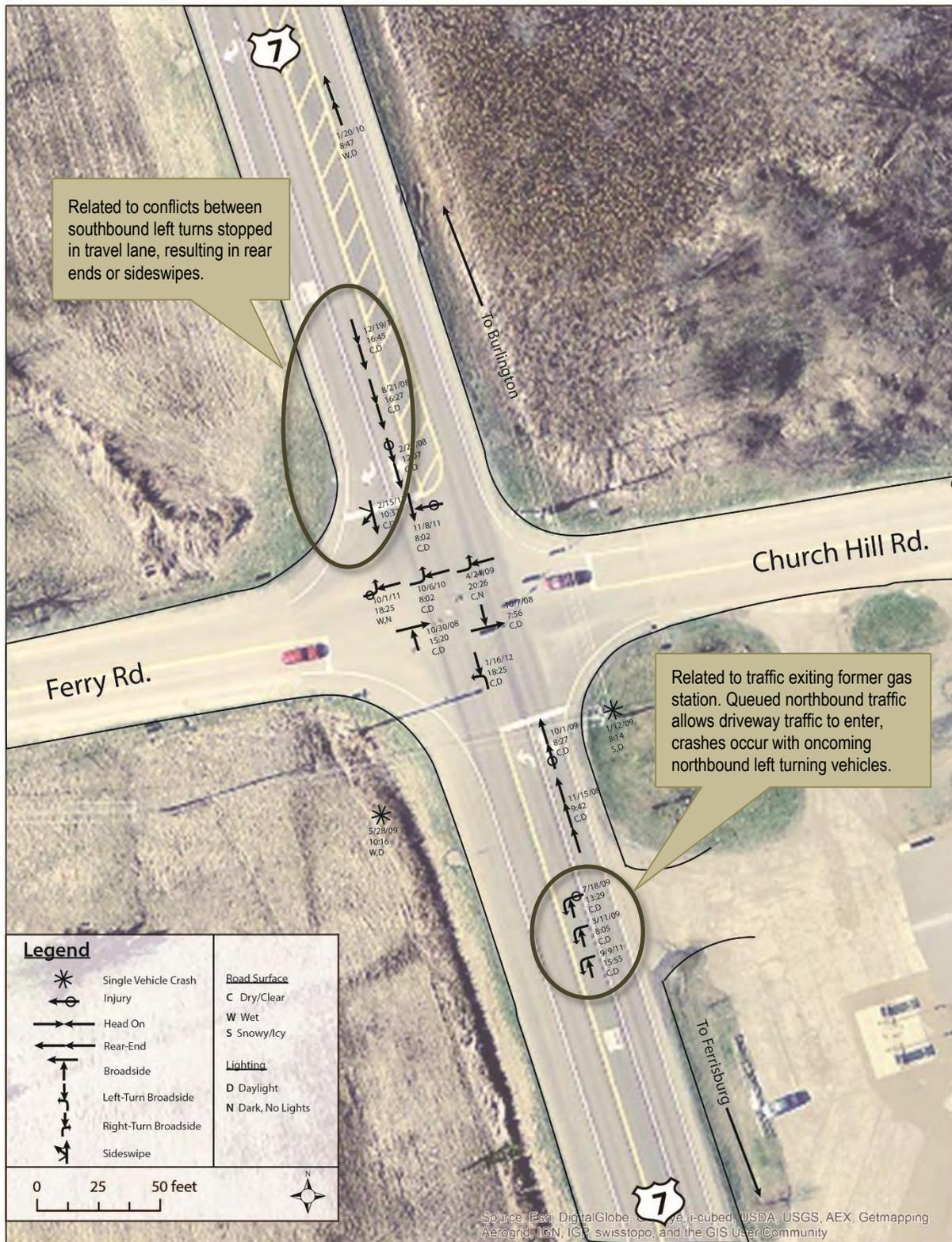
The intersection of US Route 7 and Ferry Road has been determined by VTrans to be a High Crash Location (HCL), based on the crash rate over the most recent five years for which data is available (2008 through 2012). In that period, there were 24 crashes in the vicinity of the intersection, 8 of which resulted in injuries, and 16 with property damage only. VTrans provides the crash locations to the nearest 0.01 mile post along the roadway. Figure 4 shows the crash locations and types of crashes.

Many of these crashes are characteristic of conflicts between waiting left turns and oncoming through movements (rear ends, same direction sideswipes), and vehicles making left turns with an inadequate gap or visibility (left turn/through angle broadside).

While a detailed study of intersection crashes is beyond the scope of this study, the following are possible countermeasures to address the high crash incidence at this intersection.

- Longer “all red” signal phase to allow traffic entering the intersection on a yellow light to clear the intersection (this has already been implemented by VTrans)
- Improved advanced notification signage on the northbound approach, such as a flashing beacon, could be helpful in alerting approaching traffic. (this type of notification already exists on the southbound approach).
- Closing the gas station driveways on US 7, particularly the northerly one, to exiting traffic.
- Consider adding a southbound left turn lane. This may be possible with little or no pavement widening.

Figure 4: Crash Diagram (Source: VTrans Crash Report Database, 2008-2012)



Related to conflicts between southbound left turns stopped in travel lane, resulting in rear ends or sideswipes.

Related to traffic exiting former gas station. Queued northbound traffic allows driveway traffic to enter, crashes occur with oncoming northbound left turning vehicles.

### Charlotte Town Plan – 2013

The Charlotte Town Plan contains several initiatives to establish multi-modal connections to existing and future infrastructure and promotes the establishment of park and ride lots in West Charlotte and East Charlotte Village. Several excerpts follow:

*p. 112*

6. Improvements to the intersection of US Route 7 and F5 are the responsibility of the State of Vermont. Though major improvements have been implemented, the Town, with the help of the State, will monitor this intersection to insure that safety problems are rectified. In addition, the Town will control land development in the vicinity to minimize traffic congestion and safety problems at this location. Pedestrian and bicycle safety will be given special attention when improvements are considered for this intersection.

*p. 113*

14. The Town is encouraging moderate densities and mixed uses in the two villages. This development pattern should promote the potential for pedestrian and bicycle access between homes, commercial services, and current or prospective public transportation services, including bus, rail, or other public service.

*p. 114*

5. The Town will improve pedestrian, bicycle and auto traffic safety throughout the Town, with specific attention in the West Village on Greenbush Road and Ferry Road. In the next year, accommodations for pedestrians will be made along Ferry Road between the Library and Greenbush Road.

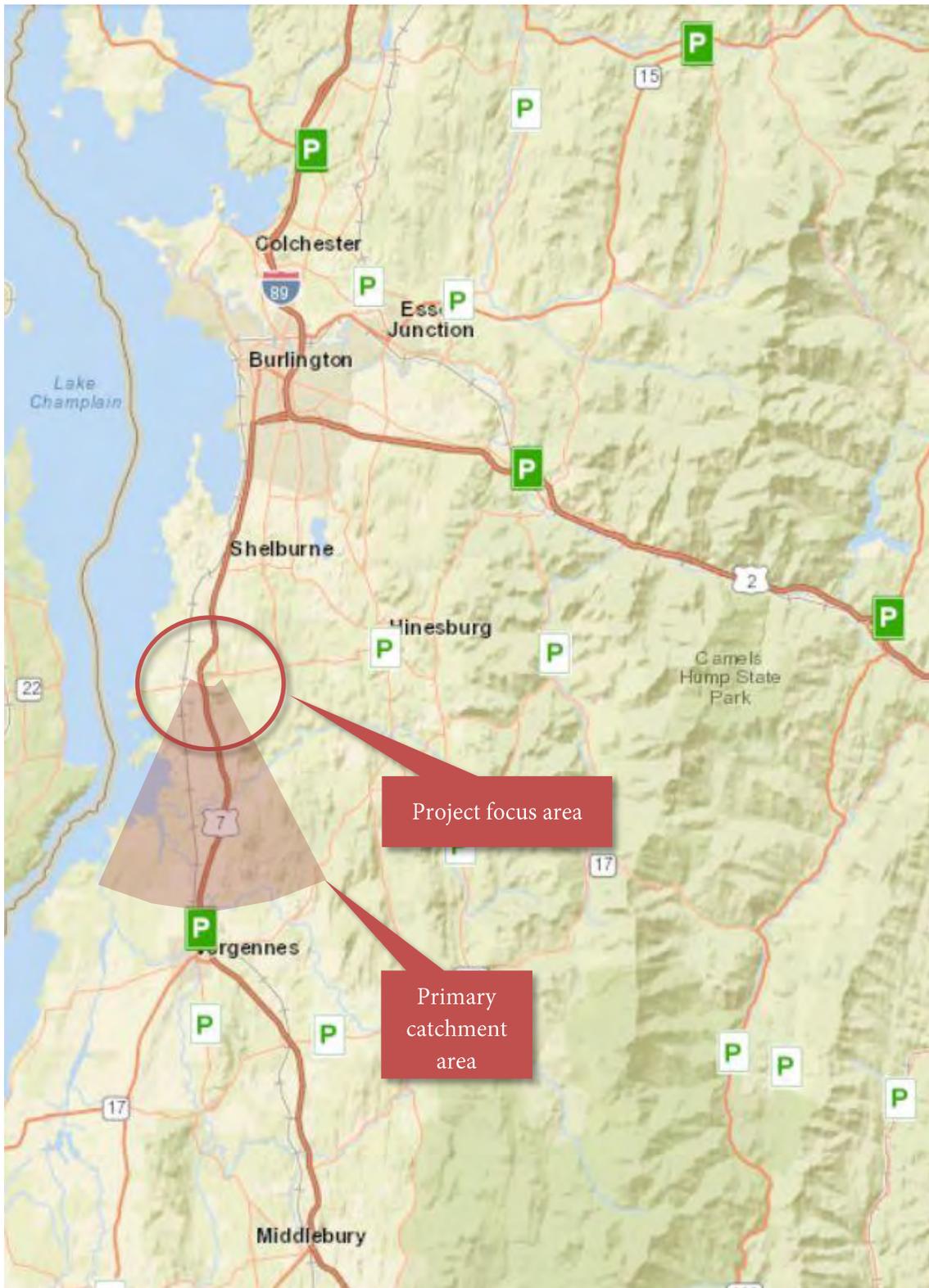
6. The Town will explore the creation of park and ride lots in the West Charlotte and East Charlotte villages; these may also serve as transit stops.

## Purpose and Need

The purpose of this project is to analyze the potential for developing a dedicated parking facility that promotes higher occupancy vehicles and transit use in the Southern Chittenden County area. There is currently a lack of convenient commuter parking along the US 7 corridor in Charlotte, which is a heavily traveled route. US Route 7 is highly congested to the north in Shelburne. Travel demand management strategies that will increase the use of non-single occupant vehicle modes (rideshare and bus transit) during the peak hours are an important component of the regional transportation plan.

The need exists as there are currently large gaps between existing park and ride locations along the critical US 7 corridor, as shown below.

Figure 5: Park and Ride Locations along the US 7 corridor



## US 7 Commuter Traffic

Park and ride lot users were found to predominantly live within 10 miles of the lot, so the main catchment area for the proposed lot in Charlotte would be residents from within Charlotte and Ferrisburgh. The existing park and ride lot in Vergennes should catch commuters from locations in Vergennes and to the south. Some potential users could come from Monkton, but residents are more likely to commute along Monkton Ridge Road rather than go out of direction to reach US 7.

The table below shows the most recent available journey to work data from the American Community Survey for residents of Charlotte and Ferrisburgh.

**Table 2: American Community Survey data for Charlotte and Ferrisburgh**

	Charlotte	Ferrisburgh
Mean Travel time of commute (minutes)	27.9	25.6
Mode share: drive alone	69.5%	79.9%
Mode share: Carpool	9.3%	9.0%
Public Transit	0.5%	1.1%
# in labor force	2,192	1,676
<i>Potential carpoolers within the Town (mode share x population)</i>	204	151
<i>Potential transit patrons within the Town (mode share x population)</i>	11	19

## Park and Ride Demand

The CCRPC developed a park-and-ride plan<sup>1</sup> which identified the need for commuter parking along the US 7 corridor in the vicinity of Charlotte's West Village. The plan included an estimate of needed capacity of 50 spaces. DuBois & King verified the demand with current data. The following formula was used to estimate the size for the park and ride lot, based on guidelines published by the Institute for Transportation Engineers<sup>2</sup>:

$$\text{Park and Ride Capacity} = 1\% \times (\text{total peak hour traffic of the primary road and adjacent intersecting roads}) + (3\% \times \text{peak hour traffic on the primary road})$$

The table below summarizes the Institute of Transportation Engineers (ITE) Capacity Calculation:

**Table 3: Park and Ride Demand in Charlotte**

	US 7	Ferry Rd	Size
AM	957	316	41.4
PM	1209	354	51.9

<sup>1</sup> Chittenden County Park-and-Ride & Intercept Facility Plan, Prepared by RSG Inc. for the CCRPC, June 2011.

<sup>2</sup> Burns, E. *Priority Rating of Potential Park-and-Ride Sites*, ITE Journal, Washington DC, 1979.

VTrans regression growth factors indicate that for this location on US 7, traffic is projected to increase by 5% between 2014 and 2034. While future use of a park-and-ride lot will depend on numerous factors beyond background traffic, including transit service levels, prices of fuel and parking, and incentives that may be provided for ridesharing, it is possible that demand for park-and-ride spaces could increase significantly more than the growth forecast.

For purposes of planning, it is assumed that a desirable lot size for commuter park-and-ride use is about 60 spaces, which is consistent with the findings of the CCRPC park-and-ride plan. However, with the potential for further increases, a site would be most desirable if it could accommodate 80 spaces, allowing for increase in usage.

## Desirable Site Characteristics

The project included public involvement and consultation with the Town of Charlotte to ensure that the recommendations arising from this study have the support of the community, and fully consider unique conditions and opportunities in the study area.

- CCTA is leasing a small number of spaces for bus patron parking on a parcel of land that is currently listed for sale, and does not have a long term location for a bus stop and commuter parking. The parking facility should provide safe and efficient access to CCTA's commuter service in a parking location that is visible and secure. The site should also provide safe circulation for buses.
- The potential for future expansion should be a factor in the selection of a location for the park-and-ride lot.
- The lot should be safe and secure, with appropriate lighting and landscaping design.
- The project should be compatible with local land uses and zoning codes.
- The development of the project (site grading, stormwater facilities etc) should minimize impacts to environmental resources (wetlands, floodplains, significant natural communities, wildlife habitat) and cultural resources.

Based in these features, the following are proposed as desirable characteristics for a park and ride site.

### Proximity and visibility to US Route 7

The ideal site should close to and visible from US 7, both for transit use and commuter parking convenience.

### Safety and security

The site should be well lit and visible from public roads so that commuters and transit patrons feel safe, and can see their way between their car and the drop-off point.

### Passenger and commuter amenities

Park-and-ride lots and transit stops that provide amenities such as shelters and lighting can be more welcoming to patrons, and add to the feeling of safety and security. For transit stops that do not provide a heated, sheltered space to wait, transit patrons typically wait in their car during cold or rainy weather, so a line of sight between parked cars and the transit vehicles is desirable. Additional amenities to enhance multimodal connectivity and transportation efficiency include as bike storage and electric vehicle hookups.

### Bus circulation

The site should allow for the circulation of transit buses, either on site or conveniently on the local street network.

### Pedestrian and bicycle access

Charlotte's West Village includes both residential neighborhoods and numerous destinations as noted earlier and shown in Figure 1. In addition, Charlotte's East Village is within easy bicycling distance to these sites, so it should be assumed that potential bicyclists could arrive at the park and ride via Church Hill Road.

Pedestrian and bicycle access to the transit stop could both reduce the parking demand and provide greater transportation choices to village residents. Currently there are no pedestrian facilities along Ferry Road, but the Town has considered their development in recent years. The safety of pedestrians potentially crossing US 7 to access the park and ride is a concern, and was the subject of a previous CCPRC study, *US Route 7/Ferry Road Pedestrian Crossing Feasibility Study*, December, 2014.

## Park and Ride Site Alternatives

A site identification process was conducted with input and collaboration of planning and administrative staff from the Town of Charlotte, the Chittenden County Regional Planning Commission, and a review of property listed for sale on the multiple listing service websites. From this process, the following sites have been identified as candidates for consideration, also shown in Figure 4. The sites were selected from an inventory of vacant or underutilized sites that are within walking distance of the intersection of US 7/Ferry Road. An additional screening criterion was that the property was either publicly owned, listed for sale, or has an owner that is not opposed to the development of a park-and-ride lot. The table below summarizes some key information, which is also shown on the attached map. These sites all have the minimum developable area of 0.6 acres, which is more than sufficient to accommodate 50 parking spaces with circulation if appropriately configured. Some sites offer significantly more developable area, as noted in the table.

**Table 4: Candidate Site Descriptions**

Site	A	B	C	D	E	F	G
Description/ Land Use	Agricultural Parcel	Village Residential Site	Town Office	Village Residential Site	Former Gas Station	Commer- cial Property	Former Flea Market
Parcel ID	00061-0140	00061- 0251	00061- 0159	00061-0065	00100-3171	00044- 0343	00004- 3205
Ownership	Private	Private- for sale	Town	Private- for sale	Private- for sale	Private	Town
Developable Area (acres outside mapped wetlands)	0.6	0.6	0.6	0.7	1.2	0.7	1.8

## Alternatives Analysis

Table 5 shows the scoring system for a site evaluation that is based on typical scoring by VTrans for Park and Ride projects, and adapted to this project. Table 6 shows the features of each candidate site in relation to the desired characteristics identified above, and Table 7 summarizes impacts and potential land costs. Following that, Table 8 summarizes the scoring of the candidate sites.

### Wetlands

Charlotte's West Village is laced with wetlands and hydric soils. D&K' wetlands biologist visited the sites, and a memorandum is attached to this report with the findings. Based on this, the likelihood of wetlands impacts is shown in Table 7.

### Hazardous Wastes

Site E is a former gas station, and is currently has an approved remediation plan with the Vermont Agency of Natural Resources. Monitoring is ongoing, and the need for clean-up depends on the future use of the site. A park and ride lot would be compatible with the potential contamination, as minimal excavation would be required.

Figure 6: Map of Site Candidates



West Charlotte Park and Ride and Transit Stop Study

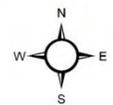
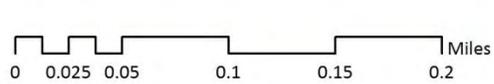


Table 5: Site Evaluation Scoring

CRITERIA	POINTS	ASSUMPTIONS
<b>Economic Considerations (33%)</b>		
Ease of Acquisition	20	Purchase possible
	10	Lease possible
	0	Condemnation may be necessary
Development Cost	10	Reasonable/Less
	5	Major
	0	Excessive
<b>TOTAL POTENTIAL POINTS</b>	<b>30</b>	
<b>Location Criteria (33%)</b>		
Proximity to intersection of US 7 and Ferry Road	20	Access within 500 feet
	10	Access within 1000 feet
	0	Access farther than 1000 feet
Transit Service Access	10	On existing route, easy access
	5	On existing route, difficult access
	0	Off existing route
Visibility from US 7	10	Very visible from a major roadway/major activity
	5	Minimal visibility from a roadway/major activity
	0	Not visible from any roadway/major activity
Access Convenience, Safety & Congestion	20	Good ingress and egress
	10	Fair ingress/egress
	0	Poor ingress/egress
<b>TOTAL POTENTIAL POINTS</b>	<b>60</b>	
<b>Site Considerations (33%)</b>		
Impact to Environmental Resources	10	Minimal Impacts
	5	Some impacts
	0	Serious impacts
Compatibility with adjacent or planned land use	10	Very compatible
	5	Some compatibility
	0	No compatibility
Number of Spaces & Expansion Potential	20	Site large enough with expansion potential
	10	Site large enough to handle 50 spaces
	0	Site unable to handle 50 spaces
Permitability	10	Good
	5	Some issues
	0	Permitting questionable
<b>TOTAL POTENTIAL POINTS</b>	<b>50</b>	

Table 6: Site Characteristics for Park and Ride Lots and Transit Stops

Site	A	B	C	D	E	F	G
Potential for Shared Use Parking	Yes	Yes	Yes	Yes	Possible	Possible	No
Proximity to Village District (feet)	0 (in village)	0 (in village)	0 (in village)	0 (in village)	440	890	2,200
Proximity to Route 7 (feet)	580	920	690	480	50	422	50
Accommodation of Bus Turnaround	No; Requires connector to adjacent property	No; Requires connector to adjacent property	Yes	No; Requires connector to adjacent property	Yes	No; Requires connector to adjacent property	Yes
Visibility from US 7	No	No	No	No	Yes	Yes	Yes
Safety and security	Good	Good	Good	Good	Very Good	Poor	Poor
Visibility from US 7	Poor	Poor	Poor	Poor	Excellent	Good	Excellent

Table 7: Impact and Costs

<i>Potential impacts to natural resources</i>							
Site	A	B	C	D	E	F	G
Wetlands (see memo for complete description)	Minimal	Hydric Soils, borderline wetland vegetation	Hydric soils; hydrophytic vegetation; impacted by mowing	Wetlands on site	Primarily non-wetland, small wetlands on edge of site.	Primarily non-wetland, small wetlands on edge of site.	None observed
Agricultural soils	land is in active agricultural use	impact to agricultural soils	impact to agricultural soils	impact to agricultural soils	None (site is developed)	None (site is developed)	impact to agricultural soils
Cultural Resources	Potential archaeological sensitivity	Potential archaeological sensitivity	Potential archaeological sensitivity	Potential archaeological sensitivity	Disturbed site is not sensitive	Disturbed site is not sensitive	Potential archaeological sensitivity
Site Hazard	none known	none known	none known	none known	Monitoring and possible clean up with ANR participation	none known	none known
<i>Cost and Valuation Information</i>							
Assessed Value	\$296,000	\$1,048,300	\$587,300	\$366,700	\$644,200	\$183,500	\$382,600
Size (Acres)	38	54	2.9	2	2.9	1.5	53
Assessed value per acre	\$7,789	\$ 19,413	\$199,085	\$ 183,350	\$ 218,373	\$ 122,333	\$ 7,219
Cost to purchase site or value of 1 acre	\$7,789	\$ 19,413	\$ 0	\$366,700	\$644,200	\$183,500	\$ 0

Table 8: Screening Evaluation of Alternatives

Site	A	B	C	D	E	F	G
Ease of Acquisition	10	20	20	10	20	10	20
Development Cost	5	5	5	5	-	5	5
<b>Economic Subtotal</b>	<b>15</b>	<b>25</b>	<b>25</b>	<b>15</b>	<b>20</b>	<b>15</b>	<b>25</b>
<i>Normalized Economic Score</i>	<i>0.50</i>	<i>0.83</i>	<i>0.83</i>	<i>0.50</i>	<i>0.67</i>	<i>0.50</i>	<i>0.83</i>
Proximity to US 7/Ferry Rd Intersection	10	5	10	20	20	20	-
Transit Service Access	5	5	5	5	10	10	10
Visibility/Security	5	5	5	5	10	-	5
Access Convenience. Safety & Congestion	10	10	20	10	20	10	20
<b>Location Subtotal</b>	<b>30</b>	<b>25</b>	<b>40</b>	<b>40</b>	<b>60</b>	<b>40</b>	<b>35</b>
<i>Normalized Location Score</i>	<i>0.50</i>	<i>0.42</i>	<i>0.67</i>	<i>0.67</i>	<i>1.00</i>	<i>0.67</i>	<i>0.58</i>
Impact to Environmental Resources	5	5	5	5	5	10	10
Compatibility with adjacent or planned land use	10	10	10	10	10	10	5
Capacity and Expansion Potential	10	10	10	10	20	10	20
Permitability	10	5	5	5	5	10	10
<b>Site Conditions Subtotal</b>	<b>35</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>40</b>	<b>40</b>	<b>45</b>
<i>Normalized Site Conditions Score</i>	<i>0.70</i>	<i>0.60</i>	<i>0.60</i>	<i>0.60</i>	<i>0.80</i>	<i>0.80</i>	<i>0.90</i>
<b>FINAL SCORE</b>	<b>1.70</b>	<b>1.85</b>	<b>2.10</b>	<b>1.77</b>	<b>2.47</b>	<b>1.97</b>	<b>2.32</b>

The scores in Table 8 were set using the scoring system outlined in Table 6, and information on each site summarized in Table 7. The scores for each of the three areas (Economic, Location and Site Conditions) were each normalized to a scale of 1.0, and then combined for a final score. The top 3 sites based on this analysis are:

- 1) Site E-Former Steve's Citgo
- 2) Site G-Former Flea Market
- 3) Site C-Behind Town Offices

## Additional Considerations

### Traffic safety implications

A traffic impact assessment and safety analysis is beyond the scope of this feasibility study. However, with the high crash location status of the US 7/Ferry Road intersection, the impacts of additional bus and vehicular traffic should be considered:

- Sites E would increase southbound left turns on US 7, which could increase the frequency of southbound rear-end crashes and broadside east-west crashes.
- Development of Site E should include closure of both access onto US 7 for access management, given the history of crashes for exiting vehicles. An alternative with in-line bus stops should be considered, as it would reduce transit delays and turning movement conflicts.

### Potential for joint use

Parking is a resource, and in many communities there are periods of time where parking demand exceeds supply. The Town of Charlotte is interested in increasing the supply of parking in the West Village area for use during peak events (most often during evenings or weekends). The potential for the parking spaces to be shared with other uses increases their benefit to the community, who may be willing to take on some level of responsibility for maintenance.

### Public and Stakeholder Outreach

A public meeting was held on August 21, 2014. In general, the concept of a park and ride/transit stop was supported. Concerns included traffic impact from buses and parking in the village, safety at the intersection, and lack of pedestrian facilities in the village. There was support for having a transit stop with amenities, to support multimodal transportation. Meeting notes are attached to this report.

## Analysis of Screened Alternatives

From the evaluation of seven sites, three are selected for the alternatives analysis, along with the no build alternative. Site designs are attached to provide approximately 60 parking spaces and bus circulation.

### Conceptual Site Design

Principles of park and ride design were applied to the three selected options. That is, form follows function and the activity zones of transit, the needs of pedestrians and cyclists, universal access, facility management and the integration into the surrounding community are considered in balance throughout the design process. The three sites were also designed to reduce circulation challenges with short aisles, to provide pedestrians visibility of transit as it arrives on site – providing riders the option to wait in their cars during cold/hot spells protecting them from the elements – and pedestrian passages through the longer parking aisles to reduce pedestrian/vehicle conflict zones. In addition, a bus shelter and bicycle facilities were located together on the site to provide parking for cyclists wanting to commute from this point forward. Landscaped areas were also provided on each site which could be used for stormwater retention, or at the very least, heat island reduction / wind breaks on the otherwise open sites. While two of the options are either within the community or nearby, one of the options (the flea market site), is distant from other amenities while having the most potential for parking expansion in the future.

For each of the three finalist sites, conceptual designs have been developed that include the following program:

- Paved parking for 60 spaces (size approximately 9' x 18'), potentially using permeable pavement under the parking stalls and conventional pavement for the traffic circulation area. (Permeable pavement may not be suitable for site C due to the hydric soils and low water table)
- Traffic circulation sufficient to allow a CCTA bus to turn around in the lot without backing up
- Lighting
- Bus shelter
- Covered bicycle parking
- Green infrastructure to mitigate increased runoff (bioretention system preferred where feasible)

The conceptual designs and cost estimates are attached to this report.

### Alternatives Analysis

The following table summarizes objective information about each site.

	No Build	C – Town Office	E-Steve's Citgo	G-Flea Market
Cost	\$0	\$550,000 +/-	\$1,458,000 +/-	\$518,000 +/-
Utility Conflicts	None	None	Possible Lighting Remaining from Gas Pumps	Light Pole in Center of Site / Overhead Wires to Building
Environmental	None	Proximate to Wetland	Proximate to Wetland	Ag Soils, Wetlands
Site capacity for expansion to 60 spaces	n/a	Yes	Yes	Yes
Expansion to larger than 60 spaces? (total capacity)		Yes (95)	Yes (120)	Yes (214)

### Site C – Town Office

Located adjacent to the Town Office, Site C meets several of the design criteria for Park and Ride facilities. Located on an existing 'loop' road that circles the Town Office and passes other town buildings along the way would increase the visibility of the service. With existing vegetation lining the northern portion of the site and some pedestrian scale lighting, the design language could be carried into the park and ride area and used to create the tone of the space. Bus circulation is already possible on the site and expansion of spaces is possible, although it is constrained by the narrow passage available on the easterly driveway access. This site is located behind a building which functions during normal business hours, and occasionally in the evenings, but would not provide 24/7 'eyes on the site' desired for personal safety. In addition, the site is a greenfield and establishing a park and ride at this location would mean site disturbance and possible unforeseen environmental impacts.

### Site E – Former Steve’s Citgo

Located adjacent to US 7 and Church Hill Road/ Ferry Road, Site E meets several of the design criteria for Park and Ride facilities. While it is less integrated into the community than Site C, it is nevertheless located within a reasonable walking/cycling distance from central town amenities. A walkway has been designed from the intersection to the transit stop to provide a direct connection for pedestrians and cyclists to access the bus shelter/stop. As it is a previously developed site, establishing a park and ride on this site would pose less additional environmental impacts, although building and concrete pad removals would be necessary. Although located next to wetland areas, these were not disturbed with the previous use of the site and the park and ride design adheres to state regulations in terms of setbacks.

Configuration of the transit stops to provide “in line” access were considered, and would only be feasible if the design speed along US Route 7 was reduced to 30 mph or less. This type of transition would be difficult to achieve unless the intersection of Ferry Road/US 7 was converted to a modern roundabout. Given that this intersection is a high crash location, redesign as a modern roundabout would address both vehicular safety and greatly improve pedestrian safety and transit access.

### Site G – Former Flea Market

Located adjacent to US 7, Site G meets several of the design criteria for Park and Ride facilities except for community integration and personal security/safety. It is far removed from other town amenities or a major intersection to be considered integrated in the community. However, this site has the most potential for expansion (over 200 spaces) and does already have a curb cut to allow for bus entry and exit on US 7. A bus shelter and bicycle facilities have also been provided and they are located in the corner back of the site, like several other existing Park and Rides in Vermont (Montpelier, for example), where the bus would loop around the parking lot prior to arriving at the stop, allowing drivers to again, wait in their cars during non-optimal weather and for safety. Located away from all existing amenities and along a fast-moving road, this site is not well suited for park and ride use in terms of personal safety.

## Recommendations

This analysis suggests that that site E has the greatest potential for a park and ride/transit stop. However, it also has by far the highest cost due to the need to acquire private property that is zoned for commercial use along a major state highway corridor, and also to provide for pedestrian access from the West Village. In addition, the VTrans site analysis methodology, which was used to screen the sites, does not provide consideration to the opportunities for joint use and development, which could significantly expand the utility of the parking facility by serving other community uses. Public and Town of Charlotte input should be considered by VTrans in the final site selection.

## Complete Streets Reporting

The CCRPC, in collaboration with its member municipalities, state and local partners, have historically taken a multimodal approach to transportation planning. The Vermont Legislature sought to further encourage these best practices with the passing of Complete Streets Legislation (Act 34) which became effective on July 1, 2011. Its purpose is to ensure the needs of all transportation users, regardless of their age, ability or preferred mode of transportation, be considered in all transportation projects. By developing a range of alternatives that would improve conditions for walkers and bikers, this project is in compliance with the complete streets legislation.

## Attachments

- Wetlands review memo, 10-1-14
- Public meeting notes, 8-21-14
- Conceptual Designs
  - Site C – Town Office
  - Site E – Former Steve’s Citgo, option 1
  - Site E – Former Steve’s Citgo, option 2
  - Site G – Former Flea Market
- Conceptual Cost Estimates



**Charlotte W. Brodie**  
Field Naturalist

34 Blair Park Road, Suite 10  
P.O. Box 1257  
Williston, Vermont 05495  
(802) 878-7661  
Fax (802) 878-2907  
cbrodie@dubois-king.com

**ENGINEERING** **PLANNING** **SURVEY**  
**PROGRAM MANAGEMENT**

**MEMORANDUM**

622386P1

**TO: Lucy Gibson, Project File**  
**SUBJECT: Charlotte Park & Ride**  
**DATE: October 1, 2014**

1. The Town of Charlotte is looking at several potential locations for a proposed Park & Ride project in the vicinity of the intersection of Ferry Road and US Route 7, as shown on the attached Location Map.
2. I visited the project area on September 18, 2014 to do a planning-level review of the wetlands in the area. Following is a description potential sites A through G.
3. Area A has very little wetland. The soil ranges from just barely hydric to non-hydric, and wetland vegetation is limited. A detailed delineation would be required to determine the actual amount of wetland.
4. Area B has common hydric soil and common wetland vegetation, although both are close to the borderline of wetland/non-wetland. A detailed delineation would be required to determine the actual amount of wetland, but it is likely to be quite extensive.
5. Area C includes maintained lawn with hydric soil, with strongly hydrophytic vegetation bordering the lawn. Thus, most of the area will be likely to qualify as wetland upon delineation.
6. Area D includes an existing road fill and mowed banks, most of which could be excluded from wetland designation, but the remainder is wetland.
7. Area E includes a very narrow fringe of wetland around the pond, wetland south of the pond, and wetland at the edge of the mowed lawn at the southwestern end of the site.
8. Area F is dry, mostly previously-filled land at the northern end of the site, with dry forest to the east. There is a small drainageway with some wetland vegetation which cuts through the fill soil, but it would not be considered jurisdictional wetland since it is a ditch in otherwise upland.

## MEETING NOTES

**Introduction.** The workshop included two elements: consideration of the draft town plan transportation and energy chapters, and the initial public meeting for the park-and-ride feasibility study. Following a short presentation summarizing the town planning process, and key findings and recommendations related to transportation in the draft plan, Brandy Saxton turned the meeting over to Lucy Gibson to discuss the park-and-ride study.

**Park-and-Ride.** Lucy Gibson reviewed the existing conditions along the Route 7 corridor generally and more specifically at the Ferry Road intersection. VTrans and CCTA are interested in locating a park-and-ride facility and bus stop along Route 7 within or close to the village center. Seven sites have been identified as potential locations for a 20- to 50-space commuter parking lot (shown as sites A-G on the attached map). There is also the opportunity that this parking could be shared with other functions or activities if located in the village with suitable pedestrian access. After her presentation, Lucy facilitated a discussion of the park-and-ride concept generally and the seven potential locations in particular, which is summarized below:

- There were several comments related to multi-modal access to the park-and-ride/bus stop. Bike lanes, shoulders, and/or sidewalks would allow people to access transit or carpooling without having to drive at all.
- There was considerable discussion of school traffic, both during this session and later in the meeting. The number of children being driven to school rather than riding the bus is generating a lot of excess traffic and congestion. The Energy Committee has identified this as something to work on. Scheduling of school and extracurricular activities outside of normal school hours is one reason some parents drive their children. Other parents find it more convenient to drop their kids off given their work schedules and the bus schedule. Some do not feel the bus is a good environment for their children or some children do not like to ride the bus. The bus routes are long and some children are on the bus for 45 minutes or more. This is an issue that should be discussed further in the town plan.
- Given the congestion and safety concerns at the Route 7-Ferry Road intersection, is it a good idea to increase traffic by building a park-and-ride? It could end up serving mostly people from out-of-town and bring more traffic to the area. Adding additional bus traffic on Ferry Road in the village could also make traffic and safety conditions worse.
- A bus stop needs to have more facilities than just parking spaces. It should have bathrooms and a heated place for people to wait. More elderly residents may be using the bus in the future, so accessibility, snowplowing and proximity to emergency services also need to be considered.
- Several people asked about funding and any costs to the town. There were concerns about losing the taxes from prime developable if VTrans purchases it for a parking lot. If the lot were on one of the town properties, who would be responsible for maintenance? The final report should include an analysis that looks not only at the upfront costs, but the long-term costs and benefits to the town.
- There was interest in learning more about the other park-and-rides on Route 7. How well-used are they? How have they impacted local traffic and circulation patterns? This should also be addressed in the final report.

## TRANSPORTATION AND ENERGY

21 Aug 2014

---

- There was a suggestion to look for opportunities to use the site to generate solar power. There are examples out there of parking lots that use solar panels to create a sort of “carport” that provides shelter to the parked cars while also generating power. There are parking lots going in with electric charging stations and some of those also incorporate solar panels. Should consider solar orientation as part of the criteria for determining the best site.
- Several people discussed the merits of a more localized, community-based ride-sharing and/or car-sharing program. That could achieve the same goal of reducing single-occupant vehicle trips without requiring large, expensive infrastructure like a park-and-ride. The state has tried to do this in the past, but it has never really taken off. It needs to be local – people don’t want to ride with strangers. Look at Front Porch Forum as a model.
- The roads around the town buildings were not designed to carry the weight of a bus. The roads would have to be rebuilt if the park-and-ride brought a lot of traffic and buses into the village.
- There was a suggestion that the bus route be relocated onto Greenbush Road, which would bypass the Route 7 and Ferry Road intersection and make it more feasible to have the park-and-ride at the train station.
- There was discussion of re-activating commuter train service during this session and later in the meeting. This is something the town plan should support. It is the best solution to the congestion problems on Route 7. With the growth occurring in Shelburne, congestion is going to reach a critical point. In the past, there has been talk of a Shelburne bypass – that would likely go through Charlotte and impact the town greatly. Transit and park-and-rides are not going to reduce traffic congestion as much as train service would. The train is also more energy efficient. The infrastructure already exists.
- One resident expressed a preference for a loop created by combining sites B-C-D with a series of smaller parking lots. Another thought that the locations directly on Route 7 were preferable because that would keep traffic out of the village.
- A question was raised about whether smaller buses could be used to provide transit, particularly for seniors.
- There were concerns that a park-and-ride would be a major change in the character of the village. It needs to be carefully considered and that will take more than 6 months. All the concerns raised need to be balanced and the bigger picture considered. The city is coming closer to Charlotte. We need to think about the changes that is causing and how the town will respond.

---

Charlotte Town Plan Workshop Series  
**TRANSPORTATION AND ENERGY**

21 Aug 2014

---

**Town Plan Transportation Chapter.** Lucy Gibson then turned the discussion back over to Brandy Saxton. She summarized some of the other transportation policies included in the draft plan and asked for feedback, which is summarized below:

- There was considerable discussion of speeding, particularly on Ferry Road. Some felt that posting the 50 MPH speed sign has increased speeding, not reduced it. Some felt that the town should not have supported the 50 MPH speed and should seek to get it lowered. There are no shoulders and a lot of people bike and walk on the road. Traffic increases greatly in summer. Tourists are not familiar with the road. Trucks and commuters are taking the ferry. All of these are combining to create dangerous conditions on Ferry Road.
- A lot of people ride horses on town roads. There should be signs letting people know to expect horses.
- Something needs to be done about the speed issues rather than just talking about it. What about speed humps (may just installed in the summer) or radar speed signs? What about wildlife crossing signs? Do signs have any affect on how people drive?
- Dean responded to some of the speed-related questions. The town does not have a large budget for enforcement but has been trying to work with the state police to increase the number of patrols. As road work is being done there are efforts being made to stripe more roads and narrow the travel lanes in an effort to calm traffic.
- Several people spoke about the need to widen shoulders to provide space for people to safely walk or bike. There was also interest in developing more off-road trails.

**Town Plan Energy Chapter.** Discussion moved next to the energy chapter of the town plan. Brandy Saxton made a short presentation summarizing the main findings and recommendations of the plan. In particular, she spoke about the role of the town plan in the state Section 248 process for permitting energy projects. The town's land use regulations are not considered and those projects do not require a permit. The town plan is considered by the Public Service Board, but to be effective it needs to be very specific about the community does and does not want. She shared examples of what some other Vermont towns have done recently to amend their plans to provide more specific language related to siting of energy projects. She then opened the floor for further discussion:

- There was a suggestion that the town focus more on energy retrofits than new construction/development. This is also an affordability issue. Lowering energy costs could allow residents on a fixed income to stay in their homes. Perhaps the affordable housing fund could be used for this purpose. It doesn't seem likely that any significant amount of new affordable housing will be built in Charlotte, but the existing housing stock could be preserved and made more affordable.
- Others felt that the focus should be on making new construction highly energy-efficient. It is more cost-effective. It can be very expensive to retrofit old buildings.
- There was discussion of siting solar on existing buildings, particularly larger structures like the school and barns, rather than taking up productive land with ground-mounted panels. There could be an inventory of suitable structures. Some people may want solar, but not have a place for it on their property. Others may have a suitable structure, but not want or

---

Charlotte Town Plan Workshop Series  
**TRANSPORTATION AND ENERGY**

21 Aug 2014

---

be able to afford installing solar. If these folks could be matched up, everyone would benefit and the power could be net-metered.

- The issue of reliance on net-metering was raised. It may not be the best solution for the long-term. It is not reliable – the rates and rules can change. A more community-based system should be explored that would generate and share power locally.
- There was general consensus that the town plan should include siting guidelines. There was discussion of considering energy facilities in the broader discussion of land use.
- The size of the project is important. Utility-scale projects need proximity to three-phase power and the electric transmission grid. Those are not available everywhere. We should determine where in town it is feasible to put such projects.
- There was a preference for multiple, small systems rather than the larger, utility-type projects. The small projects have fewer impacts, they require less infrastructure, and they improve the resiliency and security of the power grid.
- In general, there were concerns about the language in the energy section being overly mandatory (require vs. encourage). Several of the policies could be restated as a positive rather than a negative. These comments also apply to other chapters of the plan.



**Legend**

- Parcels
- Contour Lines
- Wetlands
- Agricultural Soils
- Walkway
- Landscaping
- Shelter
- Concrete Pad
- Bicycle Rack
- Future Parking Expansion
- Bus Stop
- Bus Route

N

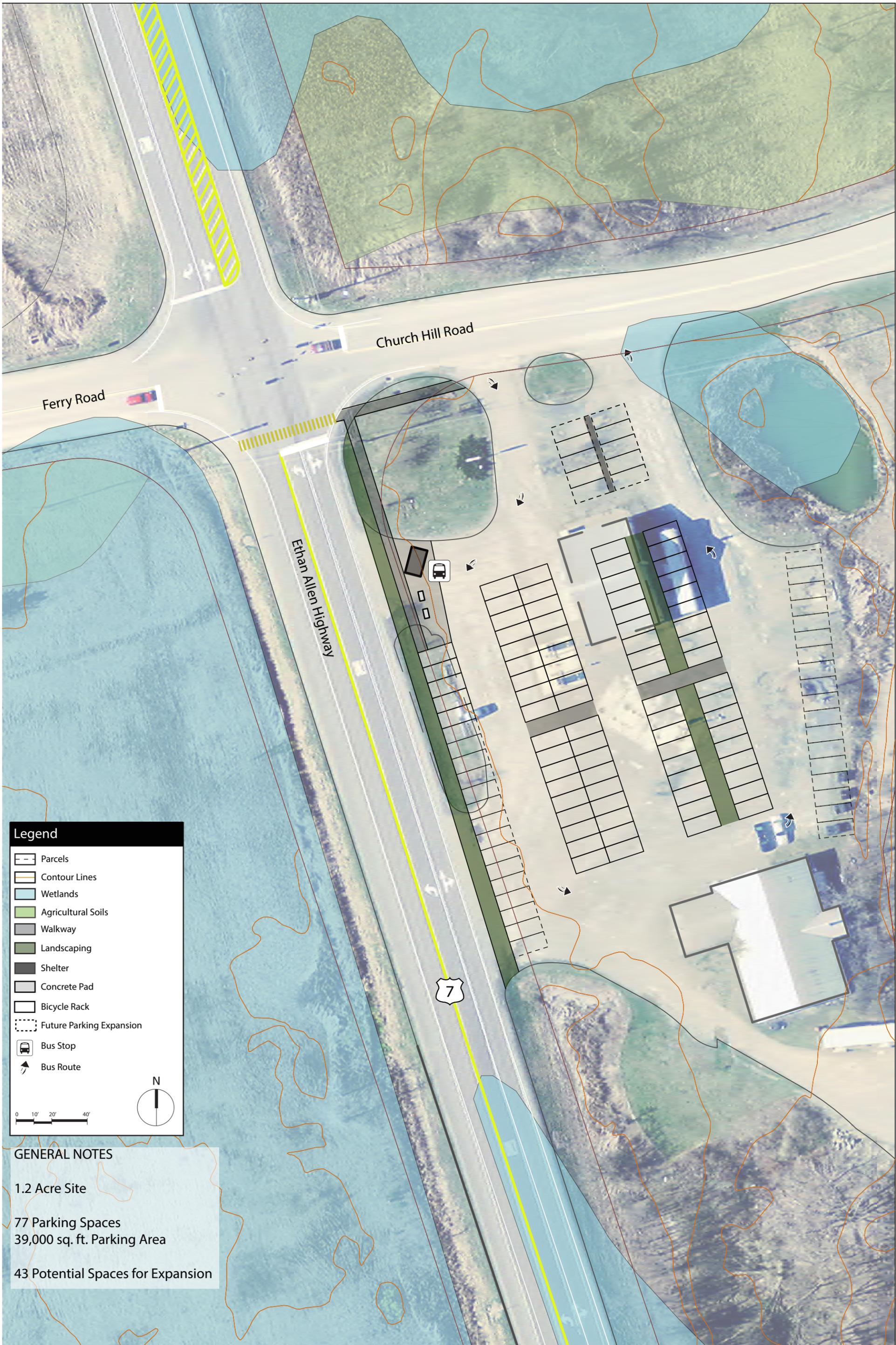
0 10' 20' 40'

**GENERAL NOTES**

0.6 Acre Site

69 Parking Spaces  
29,000 sq. ft. Parking Area

25 Potential Spaces for Expansion



**Legend**

- Parcels
- Contour Lines
- Wetlands
- Agricultural Soils
- Walkway
- Landscaping
- Shelter
- Concrete Pad
- Bicycle Rack
- Future Parking Expansion
- Bus Stop
- Bus Route

N

0 10' 20' 40'

**GENERAL NOTES**

1.2 Acre Site

77 Parking Spaces  
39,000 sq. ft. Parking Area

43 Potential Spaces for Expansion



**Legend**

- Wetlands
- Agricultural Soils
- Shelter
- Pedestrian Walkway
- Landscaping
- Bicycle Rack
- Future Parking Expansion
- Bus Stop
- Bus Route

N

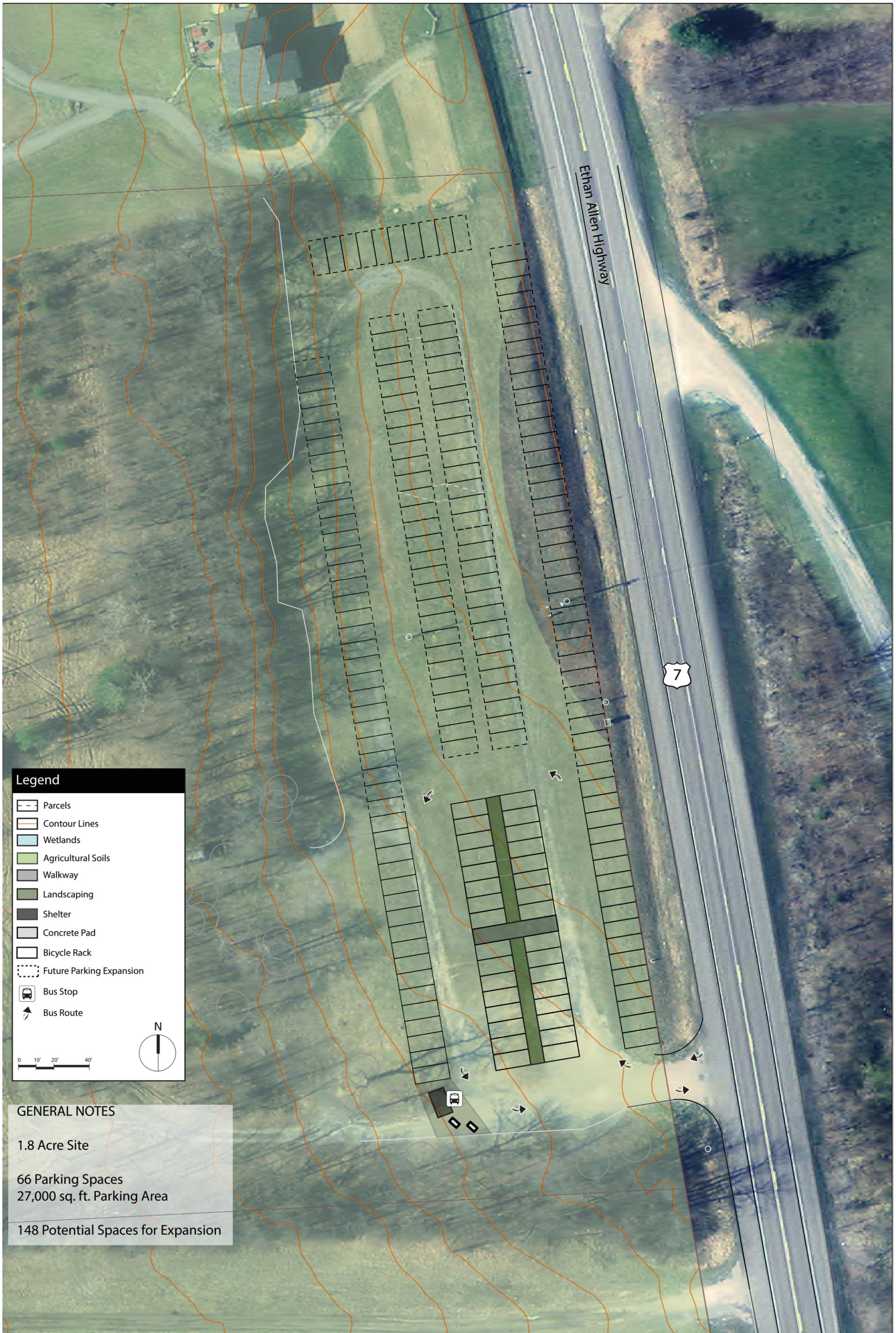
0 20' 40' 800'

**GENERAL NOTES**

1.2 Acre Site

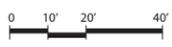
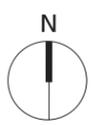
70 Parking Spaces  
29,000 sq. ft. Parking Area

47 Potential Spaces for Expansion



**Legend**

-  Parcels
-  Contour Lines
-  Wetlands
-  Agricultural Soils
-  Walkway
-  Landscaping
-  Shelter
-  Concrete Pad
-  Bicycle Rack
-  Future Parking Expansion
-  Bus Stop
-  Bus Route



**GENERAL NOTES**

1.8 Acre Site

66 Parking Spaces  
27,000 sq. ft. Parking Area

148 Potential Spaces for Expansion

CONCEPTUAL COST ESTIMATES

0 Include local project management?  
 0 Include construction inspection?

Site E - Former Steve's Citgo

	Quantity	Units	\$/unit	\$ per item
New Pavement (permeable)	1100	tons	\$ 180	\$ 198,000
Drainage allowance	1		10%	\$ 19,800
Green stormwater/Landscape	1		10%	\$ 19,800
Lighting	9	fixtures	\$ 15,000	\$ 135,000
Concrete pad/shelter/bike racl	1	ea	\$ 20,000	\$ 20,000
Sidewalk access	2000	sq ft	\$ 35	\$ 70,000
Pedestrian crossing	1		\$ 60,000	\$ 60,000
<b>Construction total</b>				<b>\$ 522,600</b>
Contingency	15%			\$ 78,390
ROW purchase				\$ 700,000
Design allowance	30%			\$ 156,780
Project Mgt allowance	0%			\$ -
Construction inspection	0%			\$ -
<b>Grand total</b>				<b>\$ 1,457,770</b>

Pavement Calc

29000  
 0.5  
 14500 cu ft  
 537.037 cu yd  
 1090.185 tons  
 2.024209 tons per cu yd

Aggregate Calcs

N/A

Site C - Town Hall

	Quantity	Units	\$/unit	\$ per item
New Pavement	730	tons	\$ 150	\$ 109,500
Drainage allowance	1		10%	\$ 10,950
Green stormwater/Landscape	1		20%	\$ 21,900
Aggregate	540	cu yd	\$ 40	\$ 21,600
Lighting	7	fixtures	\$ 15,000	\$ 105,000
Excavation	540	cu yd	\$ 22	\$ 11,880
Concrete pad/shelter/bike racl	1	ea	\$ 20,000	\$ 20,000
<b>Construction total</b>				<b>\$ 300,830</b>
Contingency	15%			\$ 78,390
Phase 1B Archaeology	1			\$ 15,000
Design allowance	30%			\$ 156,780
Project Mgt allowance	0%			\$ -
Construction inspection	0%			\$ -
<b>Grand total</b>				<b>\$ 551,000</b>

Pavement Calc

29000  
 0.333  
 9657 cu ft  
 357.6667 cu yd  
 726.0633 tons  
 2.024209 tons per cu yd

Aggregate Calcs

29000  
 0.5  
 14500 cu ft  
 537.037 cu yd

\* more challenging sc

Site G - Former Flea Market

	Quantity	Units	\$/unit	\$ per item
New Pavement	680	tons	\$ 150	\$ 102,000
Drainage allowance	1		10%	\$ 10,200
Green stormwater/Landscape	1		10%	\$ 10,200
Aggregate	500	cu yd	\$ 40	\$ 20,000
Excavation	500	cu yd	\$ 22	\$ 11,000
Lighting	8	fixtures	\$ 15,000	\$ 120,000
Concrete pad/shelter/bike racl	1	ea	\$ 20,000	\$ 20,000
<b>Construction total</b>				<b>\$ 293,400</b>
Contingency	15%			\$ 78,390
Phase 1B Archaeology	1			\$ 15,000
Design allowance	25%			\$ 130,650
Project Mgt allowance	0%			\$ -
Construction inspection	0%			\$ -
<b>Grand total</b>				<b>\$ 517,440</b>

Pavement Calc

27000  
 0.333  
 8991 cu ft  
 333 cu yd  
 675.99 tons  
 2.024209 tons per cu yd

Aggregate Calcs

27000  
 0.5  
 13500 cu ft  
 500 cu yd

Lower design fee reflects simpler permitting situation