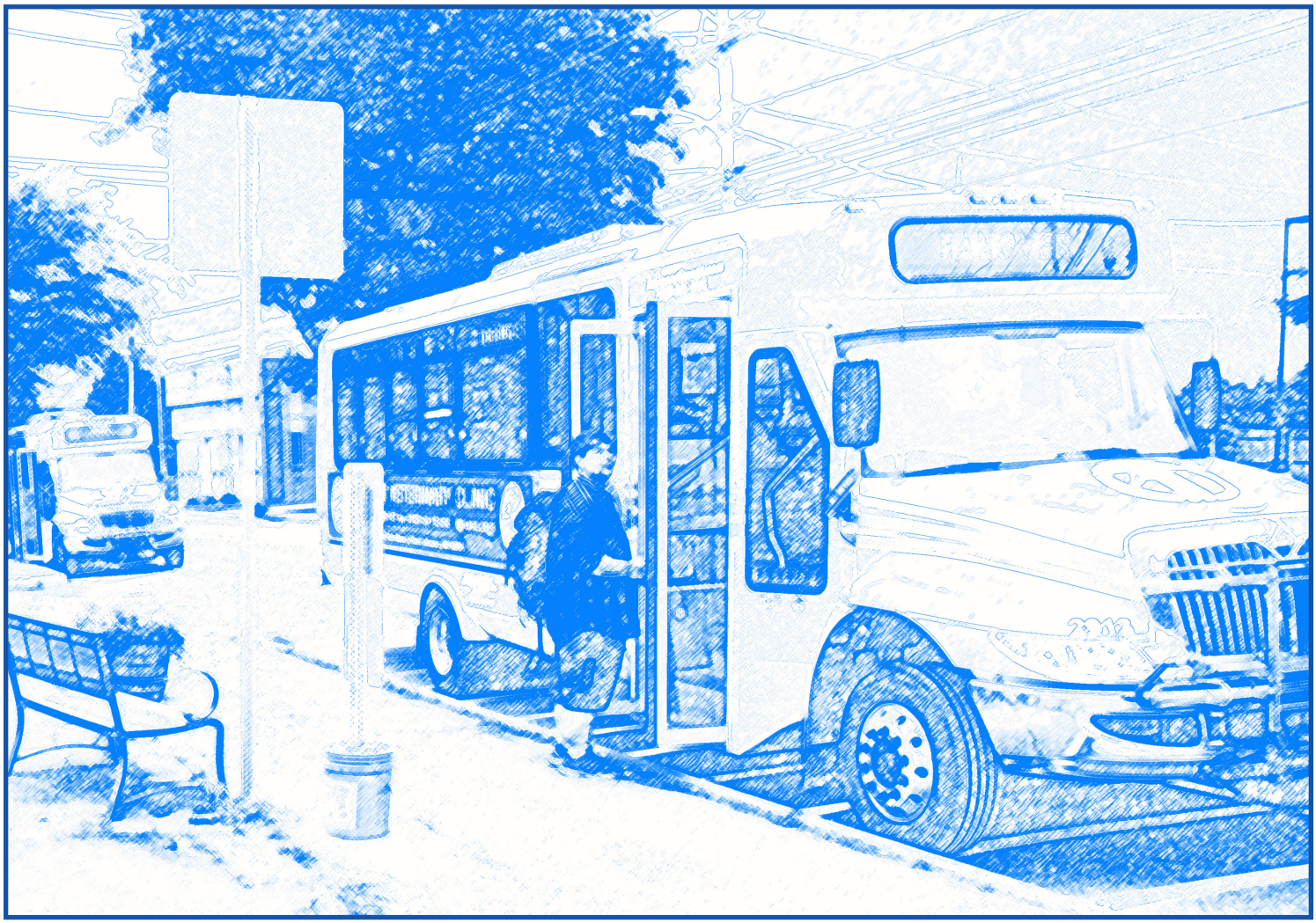
HARTFORD AND NORWICH BUS STOP STUDY 2016

ADVANCE TRANSIT



existing conditions

improvement options

level A stop

Two Rivers-Ottauquechee REGIONAL COMMISSION

Working to Get You There Vermont Agency of Transportation

Prepared for Advance Transit by the Two Rivers-Ottauquechee Regional Commission
with Public Transit Planning funds from the Vermont Agency of Transportation

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©Marysmn | Man at bus stop

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Smart Mobility and ORW, on behalf of Advance Transit, completed a bus stop study for the towns of Hanover and Lebanon in 2008 and 2010, respectively. The bus stop design configurations and general design considerations used in this study are replicated from the 2008 and 2010 studies to maintain consistency for Advance Transit.

Introduction

Advance Transit (AT) is a fixed-route transit operator that serves the City of Lebanon and the Town of Hanover, New Hampshire, and the towns of Hartford and Norwich, Vermont. Previous bus stop feasibility studies have been completed for the City of Lebanon and the Town of Hanover. This feasibility study looks to inventory existing bus stops in the towns of Hartford and Norwich, identify improvements to amenities at specific locations and to recommend bus stop design concepts. This study will address pedestrian safety concerns and provide recommendations to improve bus stops attractiveness and encourage more passengers.

Study Goals

Advance Transit ranks first as a public transit agency in small-town boardings per hour in the State of Vermont. In 2014, Advance Transit recently added a second bus to the Green Route to increase frequency to every 30 minutes. There are also several projects that are in various stages of design, permitting and construction that can provide Advance Transit opportunity to weigh in and coordinate services and bus stop design elements.

- To increase visibility and attractiveness to the community
- To increase accessibility and overall passenger's experience
- To increase ridership and transit service

FIGURE 1: FULL AMENITY BUS STOP AT KING ARTHUR FLOUR ALONG THE GREEN ROUTE
Image: TRORC Staff

FIGURE 2: ADVANCE TRANSIT SYSTEM ROUTES
Image: Advance Transit

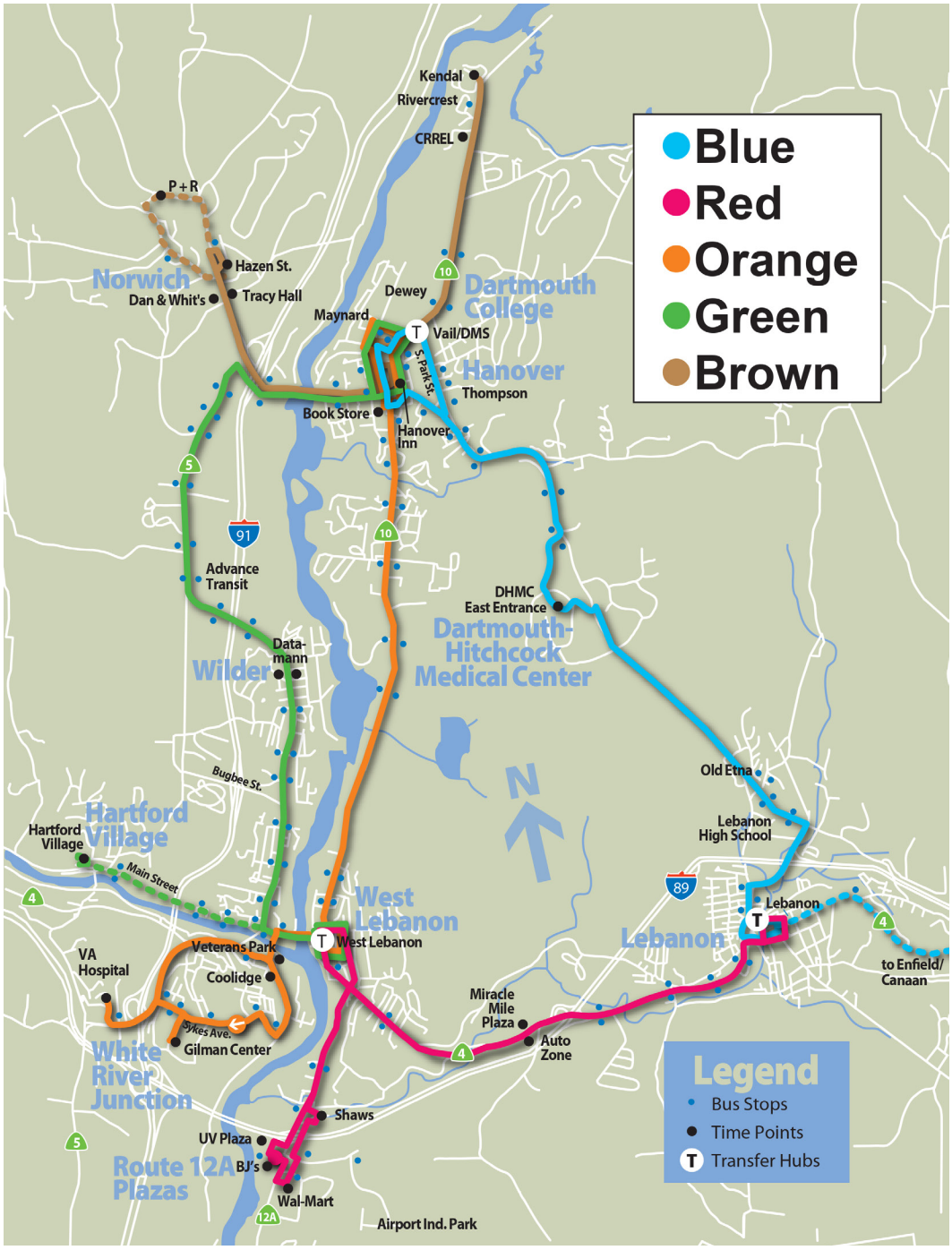


FIGURE 3: SYSTEM ROUTES IN VERMONT
Image: TRORC Staff

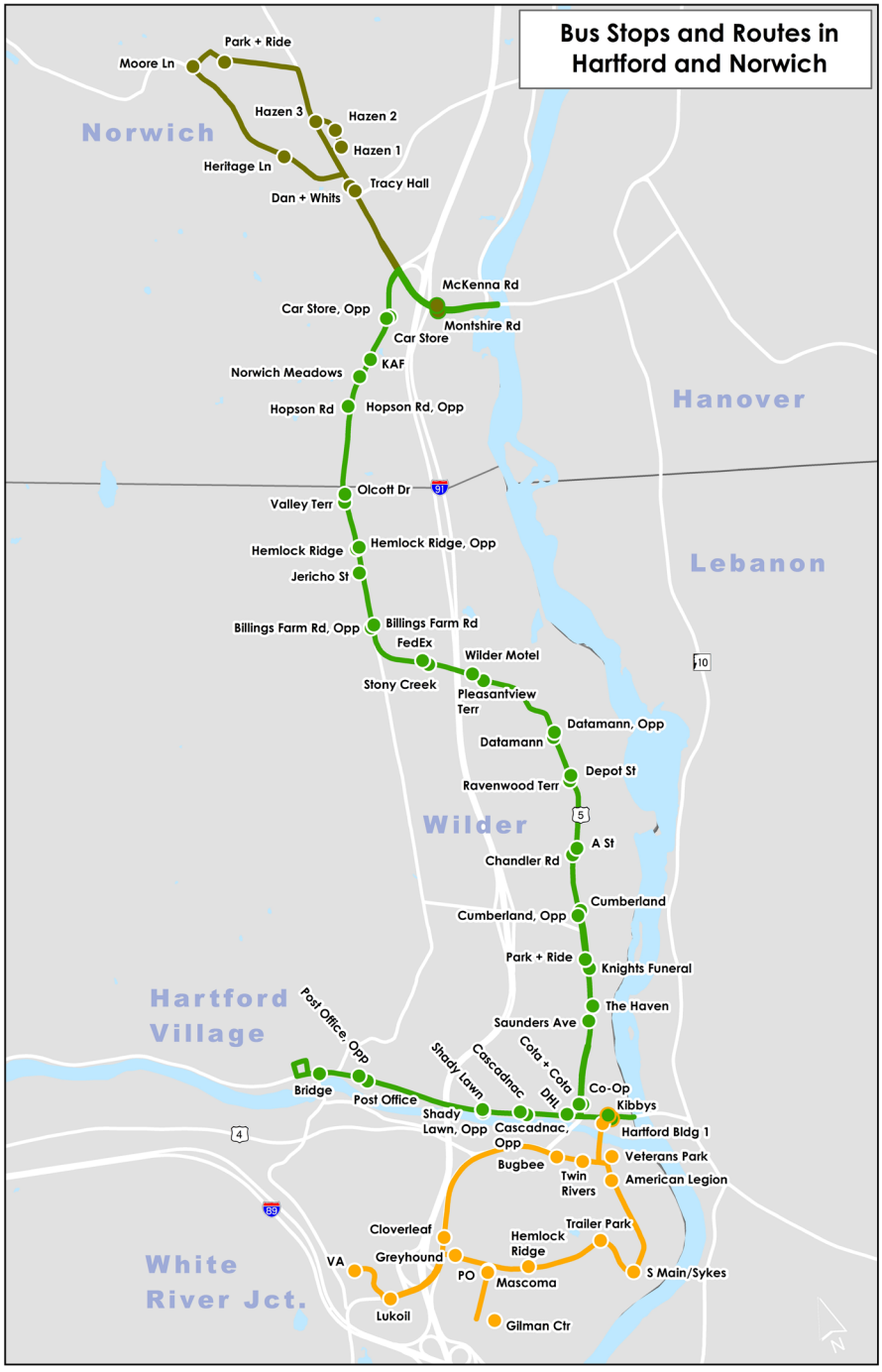


TABLE 1: DISTRIBUTION OF RIDERS BY TOWN & BY ROUTE
Source: Tom Crikelair, 2012 Advance Transit TDP

TOWN OF RESIDENCE	BUS ROUTE		
	GREEN	ORANGE	BROWN
HARTFORD	84%	31%	4%
NORWICH	2%	3%	67%
LEBANON	5%	48%	2%
HANOVER	5%	14%	24%
ENFIELD	0%	1%	0%
CANAAN	0%	0%	0%
OTHER	3%	3%	2%
TOTAL	100%	100%	100%

TABLE 2: RESIDENCE OF PASSENGERS
Source: Tom Crikelair, 2012 Advance Transit TDP

TOWN	PERCENT
HARTFORD	18%
NORWICH	6%
LEBANON	43%
HANOVER	18%
ENFIELD	4%
CANAAN	4%
OTHER	6%
TOTAL	100%

In 2012, a Transit Development Plan (TDP) was prepared which identified possible service design strategies for the next five years for Advance Transit. A passenger survey was conducted as part of this study. From the survey, Hartford and Norwich passengers make up 86% of the Green Route, 34% of the Orange Route and 71% of the Brown Route. Only 24% of Advance Transit's riders live in Vermont. The Green Route has the highest ridership of Hartford residents and serves Hartford village and Wilder up to VT10A in Norwich. The Brown Route that serves mostly the Norwich village naturally sees the highest ridership in Norwich residents. Although the Orange Route serves 62% in Lebanon and Hanover, the service connection over to White River Junction in Hartford indicate a high ridership with Hartford residents at 31%.

The map in Figure 4 details all three Advance Transit routes that operate in Vermont, each stop, and the number of boardings at each stop. The larger and darker the dot is at each spot, the more boarding's that particular stop experiences in any given month indicating the usage.

FIGURE 4: MONTHLY BOARDINGS BY ADVANCE TRANSIT STOPS
Image: TRORC Staff

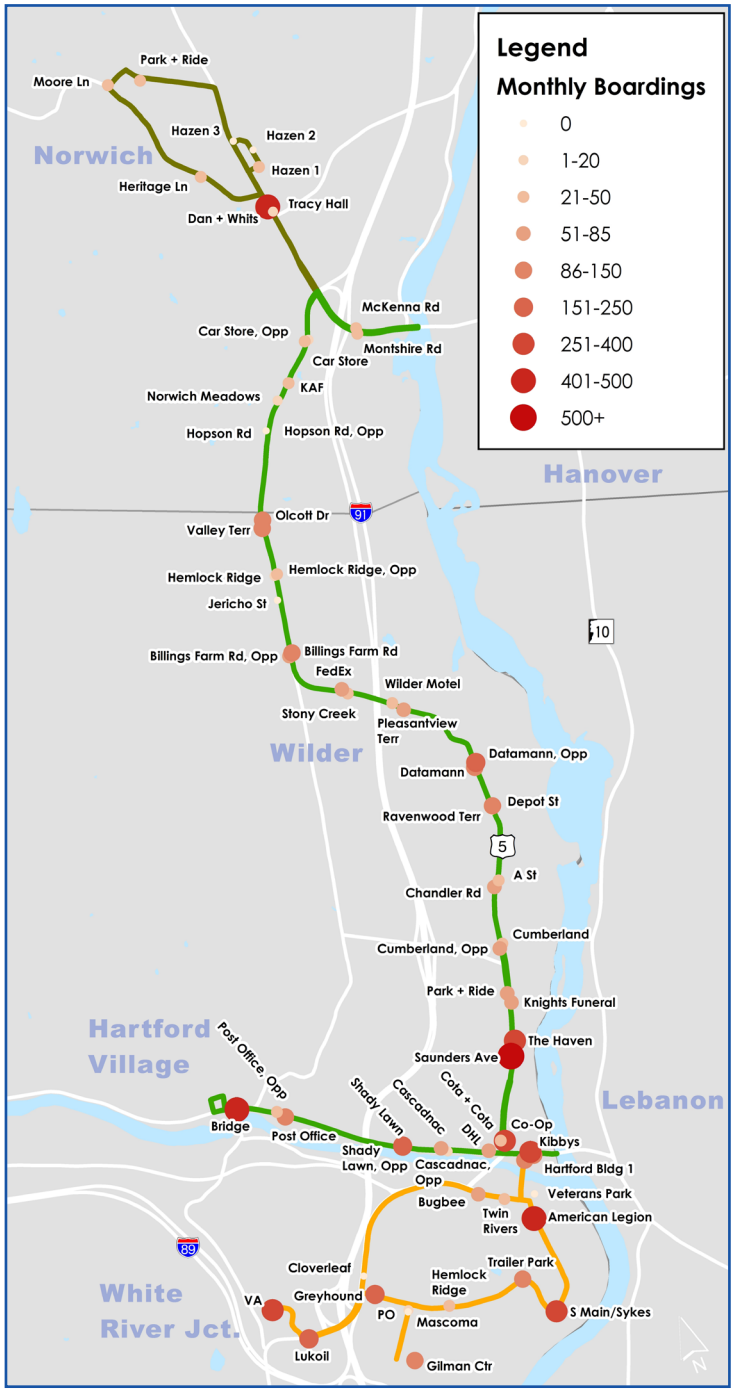


FIGURE 5: ADVANCE TRANSIT SYSTEM BOARDINGS 2005-2015
Source: Advance Transit Ridership Data

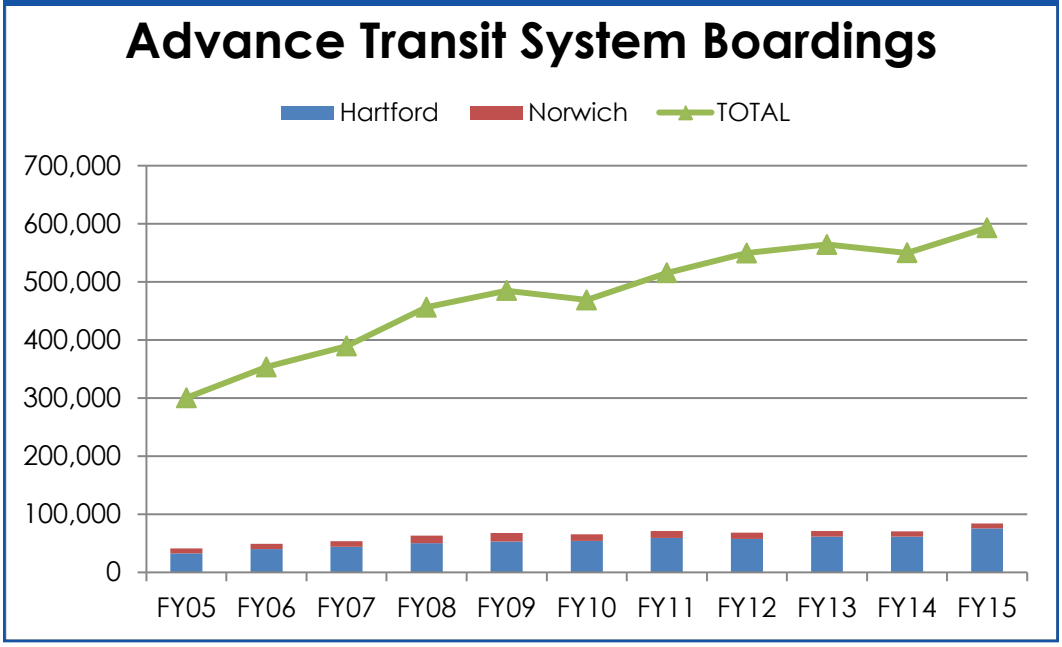
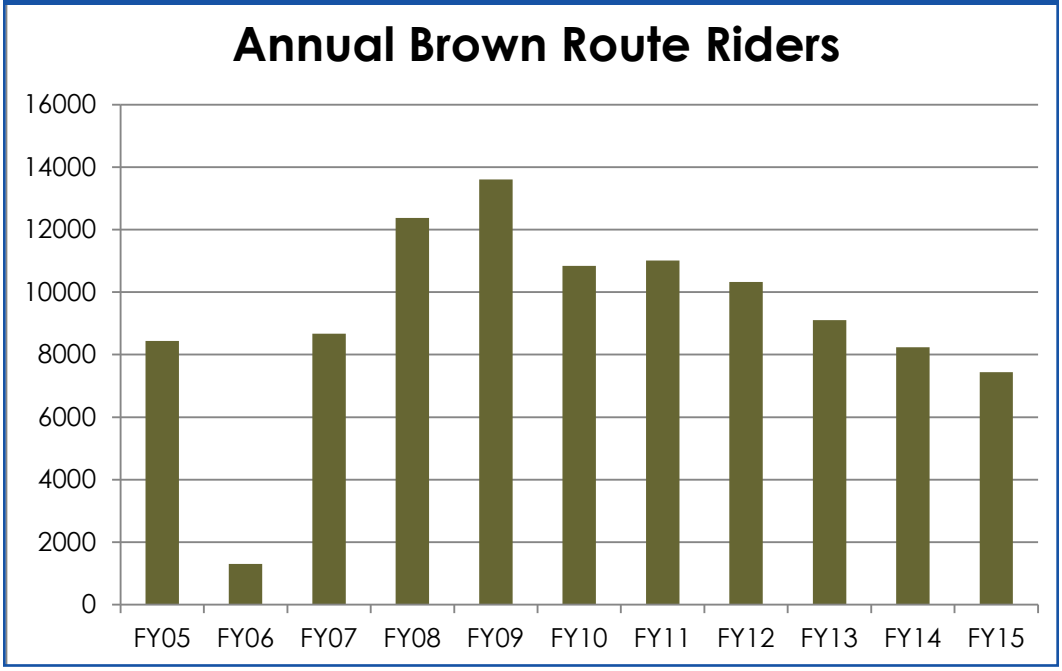


FIGURE 6: ANNUAL BROWN ROUTE RIDERS 2005-2015
Source: Advance Transit Ridership Data



Comparing the Vermont boarding totals in the last 10 years to the overall Advance Transit fixed route system boardings, Vermont makes up on average 14% of total system boardings. The Brown Route ridership peaked in 2009 with 13,600 passengers; and since the service was rerouted to serve the municipal park and ride that opened in Norwich in 2009, ridership has been steadily declining. The

FIGURE 7: ANNUAL GREEN ROUTE RIDERS 2005-2015
Source: Advance Transit Ridership Data

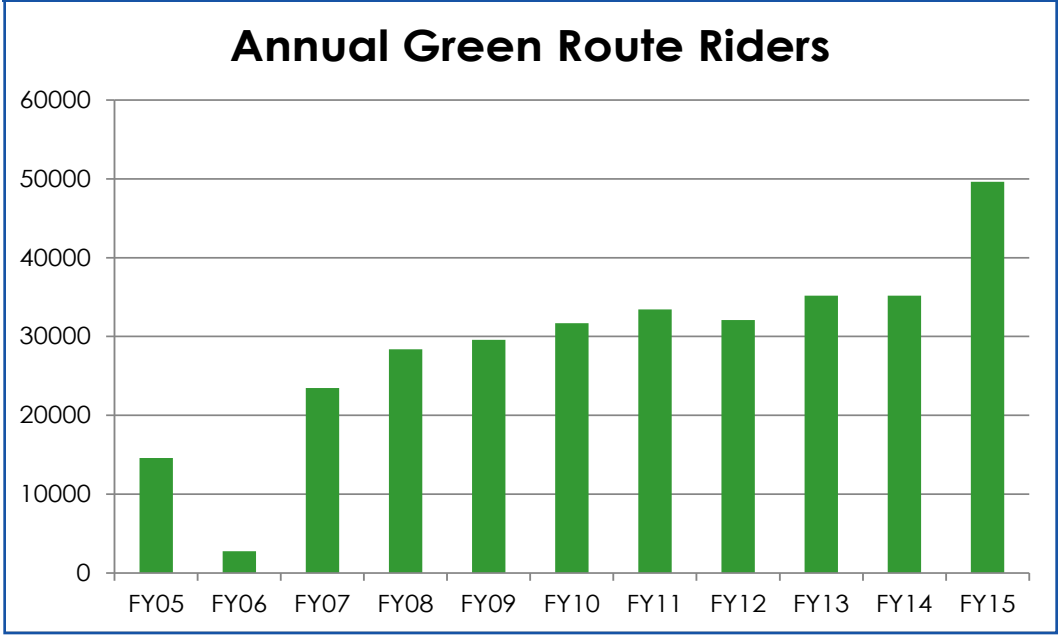
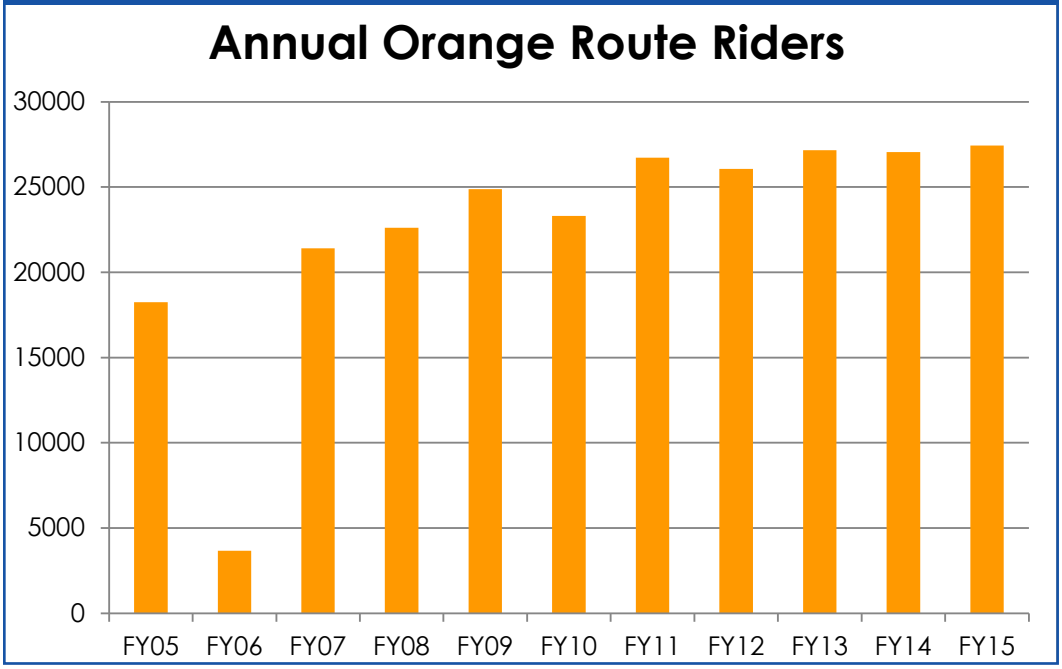


FIGURE 8: ANNUAL ORANGE ROUTE RIDERS 2005-2015
Source: Advance Transit Ridership Data



Green Route was steadily increasing prior to 2015 when Advance Transit added a second bus to the service with 30 minute headways in 2014. Ridership increased by 41% with the new service to just under 50,000 passengers. The Orange Route is increasing towards 27,000 passengers.

Bus Stop Inventory

Advance Transit System Routes

An inventory of Advance Transit bus stops was conducted along the Vermont bus service routes to document the basic physical condition, traffic and transit service characteristics of each stop. The inventory (Table 3) contains the following information for each stop (the complete inventory is found in Appendix A):

- **Route:** Which AT bus routes serve this stop?
- **Headway:** What is the timing of bus routes serving this stop?
  - > **Brown:** Every 30 minutes
  - > **Green:** Every 30 minutes
  - > **Orange:** Every 60 minutes
- **Street:** Street location of bus stop.
- **Sign:** Is there a sign identifying the bus stop?
- **Shelter:** Is the bus stop served by a shelter?

FIGURE 9: BUS STOP AT BILLINGS FARM RD ALONG THE GREEN ROUTE CONSISTING OF A BUS STOP SIGN AND SCHEDULE
Image: TRORC Staff

FIGURE 10: BUS STOP AT CO-OP ILLUSTRATING CURBSIDE STOP
Image: TRORC Staff

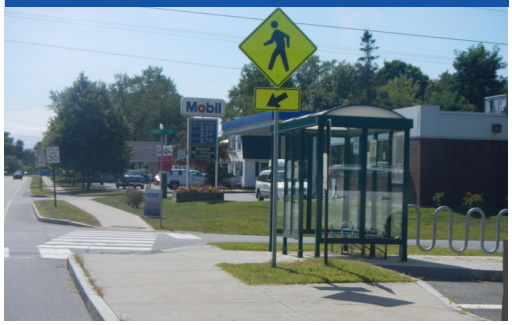
- **Bus Stop Type:** There are two types of bus stop configurations in Hartford and Norwich:

  Curbside: Buses pull up to the curb. This is the most common configuration for a bus stop for a number of reasons; mostly it does not require any changes to the street environment. A curbside stop may be in the travel lane or on a shoulder in the road.

  Turnout: There is a recessed curb area that allows the bus to pull out of the flow of traffic. Bus turnouts are recommended where warranted by vehicle speeds and volumes, passenger boardings and longer dwell times for buses. Turnouts are not desirable in some cases as they create difficulties for buses re-entering the traffic stream, particularly during peak commuting hours.

- **Buses per Day:** How many buses per day serve this stop? This is one useful measure of the relative importance of the stop.
- **Average Monthly Boardings:** How many passengers board a bus at this stop? The boarding data includes riders boarding a bus at the particular stop. This data does not include passengers alighting or getting off the bus at the stop, so in this manner, it does not reflect the total rider traffic at a bus stop. This is another useful measure of relative importance of a bus stop.
- **Accessibility:** This is a general assessment how easy or difficult the stop is for persons with disabilities, particularly wheelchairs. Most of the stops do not meet ADA requirements, specifically a 5-foot by 8-foot paved landing for deployment of the wheelchair lift, boarding and waiting areas connected to a sidewalk, detectable warnings, and curb ramps. Stops were rated 'good' if these improvements were in place. Stops were rated 'fair' if a wheelchair lift or 'kneeling' bus could deliver a wheelchair to a sidewalk either by a nearby driveway with curb ramps to the sidewalk or a paved sidewalk. Stops were rated 'poor' if a wheelchair would be delivered to a street, shoulder, driveway or unpaved surface. The lack of sidewalks in many areas creates an issue for accessibility.

FIGURE 11: BUS STOP AT TAFTS FLATS ILLUSTRATING CROSSWALKS IN VICINITY
Image: TRORC Staff



- **Sidewalks:** Is the bus stop served by sidewalks? This is an important indicator of how well the bus stop is integrated into the pedestrian network; this is a key consideration as most bus trips begin and end as a pedestrian trip.
- **Crosswalks:** Are there crosswalks nearby? Like sidewalks, crosswalks are an important indicator of how well the bus stop is served by the pedestrian network. Crossings nearby are important because transit patrons often arrive on one side of the street and depart on the other.
- **Bike Racks:** Accommodations of bicycles at bus stops is another consideration. Arriving at a bus stop by bike is an attractive option, particularly at stops where homes may be located a distance that is a bit outside of a comfortable walking radius. A couple of examples of this are at the King Arthur Flour or Tafts Flats bus stop. Advance Transit buses accommodate bikes on external rack so passengers may take their bike with them if they have a place to park their bikes at their destination. This study documents whether bike racks are located at or nearby the stop.
- **Traffic Volume:** Daily traffic volumes are a consideration in bus stop design, particularly for whether or not a turnout is warranted. The traffic volume on each street was estimated from the most recent available traffic data, and has been characterized based on 'natural breaks' in the data as follows:

  Low: Less than 2,000 vehicles per day

  Medium: 2,000 to 7,000

  High: 7,000 to 12,000

  Very High: over 12,000

- **Traffic Speed:** The speed of traffic is another consideration that affects both the need for a bus turnout, and the pedestrian safety of the bus stop. The posted speed limit is noted as an indicator of the typical prevailing speed. Motorist speeds will vary by time of day, and are likely to be near or below the posted speed limit during peak hours of traffic. During off-peak or evening hours, traffic speeds are likely to exceed the posted speed limit in some locations.

FIGURE 12: BIKE RACKS AT THE KING ARTHUR FLOUR BUS STOP
Image: TRORC Staff

TABLE 3: BUS STOP INVENTORY SUMMARY TABLE BY ROUTE
Source: Advance Transit

	Bus Stop	Brown	Orange	Green	Direction (Bound)	Street	Traffic Volume	Traffic Speed	Bus Stop	Buses /Day	Avg. Monthly Board-ings	Sign	Shelter	Accessibility	Sidewalks	Crosswalks	Bike Racks
1	Saunders Ave			x	S	US5	6500	30	Curbside	26	568	Y	Y	Y	Y	N	N
2	American Legion		x		S	South Main St	1800	25	Curbside	12	470	Y	Y	Y	Y	Y	N
3	VA Cutoff Bridge			x	E	Maple St	4400	30	Shoulder	26	455	Y	Y	Y	Y	Y	N
4	Dan & Whits	x			E	Main St	2500	25	Curbside	18	448	Y	Y	Y	Y	Y	N
5	Kibby Equipment		x	x	W	Maple St	10500	25	Parking Lot	36	341	Y	N	Y	Y	N	N
6	VA Hospital		x		S	Veterans Dr/ US5	7500	15	Parking Lot	12	334	N	N	Y	Y	Y	N
7	Haven NB			x	N	US5	6500	30	Curbside	26	326	Y	Y	N	Y	N	N
8	S. Main & Mountain Ave		x		S	South Main St	1800	25	Curbside	12	310	Y	N	N	Y	Y	N
9	US 5 @ Co-op			x	N	US5	6500	30	Curbside	26	253	Y	Y	N	Y	N	N
10	US 5 @ Lukoil		x		N	US5	7500	40	Curbside	12	243	Y	N	Y	N	N	N
11	Datamann, Opp.			x	N	US5	4800	30	Shoulder	26	219	Y	N	N	N	N	N
12	Shady Lawn			x	W	Maple St	4400	35	Parking Lot	26	213	Y	N	Y	N	N	N
13	Greyhound		x		S	Sykes Mountain Ave	10000	30	Curbside	12	172	Y	N	Y	N	N	N
14	Gilman Complex		x		S	Holiday Dr	-	10	Parking Lot	12	150	Y	Y	Y	N	N	N
15	Datamann			x	S	US5	4800	30	Curbside	26	147	Y	Y	N	N	N	N
16	Hartford Municipal Bldg		x	x	E	Maple St	10500	25	Curbside	36	141	Y	N	Y	Y	Y	N
17	Bridge St.		x		N	Bridge St	3800	25	Curbside	12	136	Y	N	Y	Y	N	N
18	Valley Terrace			x	S	US5	4900	30	Shoulder	26	132	Y	N	Y	N	N	N
19	Billings Farm Road			x	N	US5	4900	30	Shoulder	26	131	Y	N	Y	N	N	N
20	Ravenwood			x	S	US5	4100	30	Curbside	26	125	Y	N	N	Y	Y	N
21	Trailer Park @ Sykes		x		S	Sykes Mountain Ave	5400	30	Curbside	12	112	Y	N	N	N	N	N
22	Olcott Industrial Park			x	S	US5	4900	30	Curbside	26	101	Y	N	N	N	N	N
23	Hartford PO			x	E	Maple St	4400	35	Parking Lot	26	91	Y	N	Y	Y	N	N

TABLE 4: BUS STOP INVENTORY SUMMARY TABLE BY ROUTE
Source: Advance Transit

	Bus Stop	Brown	Orange	Green	Direction (Bound)	Street	Traffic Volume	Traffic Speed	Bus Stop Type	Buses /Day	Avg. Monthly Board-ings	Sign	Shelter	Accessibility	Sidewalks	Crosswalks	Bike Racks
24	Depot St			x	N	US5	6500	30	Shoulder	26	88	Y	N	Y	N	N	N
25	Chandler Road			x	S	US5	6500	30	Shoulder	26	85	Y	N	N	N	N	N
26	Shady Lawn, Opp			x	E	Maple St	4400	35	Shoulder	26	68	Y	N	Y	N	N	N
27	Park & Ride, Tafts Flats			x	S	US5	6500	30	Curbside	26	67	Y	Y	Y	Y	N	Y
28	Cumberland Farms, Opp.			x	S	US5	6500	30	Shoulder	26	64	Y	N	Y	N	N	N
29	DHL			x	N	Maple St	4400	35	Parking Lot	26	55	Y	N	Y	Y	N	N
30	Billings Farm Rd, Opp.			x	S	US5	4900	30	Shoulder	26	54	Y	Y	N	N	N	N
31	Fed Ex			x	N	US5	4000	30	Shoulder	26	54	N	N	Y	N	N	N
32	Bugbee Senior Center		x		N	North Main St	3100	25	Curbside	12	54	Y	N	Y	Y	N	N
33	Knight Funeral Home			x	N	US5	6500	30	Curbside	26	52	Y	N	N	Y	N	N
34	Park & Ride, Turnpike Rd	x			W	Turnpike Rd	500	25	Parking Lot	7	45	Y	Y	Y	N	N	N
35	Hickory Ridge		x		S	Sykes Mountain Ave	5400	30	Curbside	12	45	Y	N	N	N	N	N
36	Montshire Road	x		x	E	VT10A	12500	25	Curbside	41	44	Y	N	Y	Y	Y	N
37	Stoney Creek			x	S	US5	3400	30	Curbside	26	42	Y	N	Y	Y	N	N
38	A Street			x	N	US5	6500	30	Curbside	26	42	Y	N	Y	Y	Y	N
39	Hartford PO, Opp.			x	W	Maple St	4400	35	Curbside	26	41	Y	N	N	N	N	N
40	Wilder Motel			x	N	US5	3400	30	Shoulder	26	39	Y	N	Y	N	N	N
41	Twin River Clinic		x		N	North Main St	3100	25	Curbside	12	39	Y	N	Y	Y	Y	N
42	Heritage Lane	x			E	Heritage Ln	400	25	Curbside	7	36	Y	N	Y	N	Y	N
43	Hemlock Ridge, Opp.			x	N	US5	4900	30	Shoulder	26	34	Y	N	Y	N	N	N
44	Hazen Street	x			W	Hazen St	250	25	Shoulder	12	32	Y	Y	Y	N	Y	N

TABLE 5: BUS STOP INVENTORY SUMMARY TABLE BY ROUTE
Source: Advance Transit

	Bus Stop	Brown	Orange	Green	Direction (Bound)	Street	Traffic Volume	Traffic Speed	Bus Stop Type	Buses/Day	Avg. Monthly Board-ings	Sign	Shelter	Accessibility	Sidewalks	Crosswalks	Bike Racks
45	Cascadnac			x	W	Maple St	4400	35	Curbside	26	32	Y	N	Y	Y	Y	N
46	US 5 @ Cota & Cota			x	S	US5	6500	30	Curbside	26	31	Y	N	N	N	N	N
47	McKenna Road	x		x	W	VT10A	12500	25	Curbside	44	30	Y	N	Y	Y	Y	N
48	Cumberland Farms			x	N	US5	6500	30	Curbside	26	27	Y	N	Y	Y	N	N
49	Moore Lane	x			W	Moore Ln	250	25	Shoulder	7	27	Y	N	Y	N	N	N
50	King Arthur Store			x	N	US5	4100	30	Curbside	26	27	Y	Y	Y	N	N	N
51	Carstore, Opp			x	S	US5	4100	30	Shoulder	26	23	Y	N	N	N	N	N
52	Hemlock Ridge			x	S	US5	4900	30	Shoulder	26	13	Y	N	Y	N	N	N
53	Cascadnac, Opp			x	E	Maple St	4400	35	Shoulder	26	12	N	N	Y	N	N	N
54	Tracy Hall	x			W	Main St	2500	25	Curbside	15	10	Y	N	Y	Y	Y	N
55	Carstore			x	N	US5	4100	30	Curbside	26	9	Y	N	Y	N	N	N
56	Glen Ridge Rd	x			E	Glen Ridge Rd	400	25	Shoulder	7	8	Y	N	Y	N	N	N
57	Mascoma, Holiday Dr		x		S	Holiday Dr	5400	30	Curbside	12	7	Y	N	N	N	N	N
58	Hazen Street & Cliff	x			W	Hazen St	250	25	Shoulder	12	0	Y	N	Y	N	N	N
59	Hazen Street & Main	x			W	Hazen St	250	25	Shoulder	12	0	Y	N	Y	N	N	N
60	Norwich Meadows - Drop Off Only			x	S	US5	3800	30	Curbside	26	0	Y	N	Y	N	N	N
61	Hopson Road - Drop Off Only			x	S	US5	4900	25	Shoulder	26	0	N	N	Y	N	N	N
62	Jericho - Drop Off Only			x	S	US5	4900	30	Shoulder	26	0	N	N	Y	N	N	N
63	Post Office - Drop Off Only		x		S	Sykes Mountain Ave	5400	30	Curbside	12	0	N	N	Y	N	N	N
64	Pleasantview Terrace			x	S	US5	4000	30	Curbside	26	0	Y	N	Y	N	N	N

Bus Stop Categories

The following are the primary recommendations of this study.

Each bus stop in the study area has been assigned a "level" of A through C, based on the relative importance of each bus stop in terms of total boardings, bus frequency, and number of bus routes served. Table 6 shows goals for each level of stop. The following sections describe appropriate features of the bus stops.

TABLE 6: BUS STOP INFORMATION GOALS FOR PASSENGERS
Source: Hanover Bus Stop Feasibility Study 2008

LEVEL	INFORMATION
A	Real time bus arrival information Complete route and schedule information posted at shelter Name of the bus stop provided visibly on the shelter
B	Complete route and schedule information posted on shelter Cell phone accessible schedule information Name of the bus stop provided visibly on the shelter
C	Signage visible to pedestrians on both sides Information on which route stops there

Level A

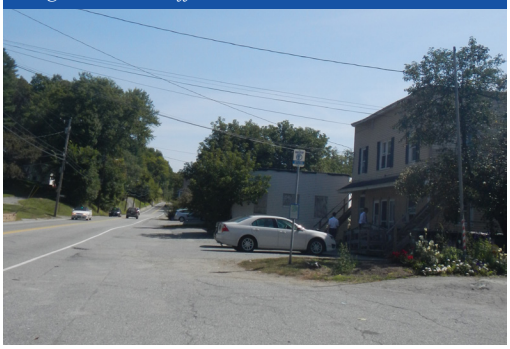
These stops should have the highest level of amenities, including signage, a shelter, and route and schedule information.

These eight are the most important bus stops based on number of users, transfers, bus frequency, and routes served.

FIGURE 13: LEVEL A BUS STOP AT AMERICAN LEGION
Image: TRORC Staff

FIGURE 14: LEVEL B BUS STOP AT VA BRIDGE
Image: TRORC Staff

FIGURE 15: LEVEL C BUS STOP AT POST OFFICE
Image: TRORC Staff



The proposed Level A bus stops are as follows:

- Saunders Ave
- American Legion
- Dan & Whits
- VA Cutoff Bridge
- Kibby Equipment

- VA Hospital
- The Haven
- S. Main & Sykes Mountain Ave

Level B

These are stops with moderate boardings and importance, and should have at a minimum, a bus shelter with map, route and schedule information; safe pedestrian access; good lighting; an accessible environment; and signage. There are 12 bus stops in this category, and several are in need of shelters, signage, and improvements for accessibility and pedestrian safety. For stops on on high traffic routes, these stops should be considered for bus turnouts, due to their higher frequency of use and boardings.

Level C

These are the bus stops with the lowest number of boardings, and therefore are relatively less critical for improvements. At a minimum, there should be signage and reasonable safe pedestrian access. Some of these stops may become more important over time, as land development projects, service improvements and fuel prices may generate additional riders. Continued monitoring of the boardings and activity at these stops should be conducted to determine if amenities are needed in the future.

BUS INFORMATION

Each bus stop should provide as much information on the Advance Transit system as possible. Table 7 provides a listing of the bus stop, relevant data, and a proposed designation.

FIGURE 16: BUS STOP ROUTE INFORMATION AT A LEVEL A STOP
Image: TRORC Staff

FIGURE 17: BUS STOP ROUTE INFORMATION AT A LEVEL C STOP
Image: TRORC Staff

TABLE 7: ADVANCE TRANSIT BUS STOP CLASSIFICATION
Source: Advance Transit

Stop Name	Stop Class	Buses/Day	Monthly Boardings	Stop Name	Stop Class	Buses/Day	Monthly Boardings
Saunders Ave	A	26	568	Bugbee Senior Center	C	12	54
American Legion	A	12	470	Knight Funeral Home	C	26	52
Dan & Whits	A	16	448	Hickory Ridge	C	12	45
VA Cutoff Bridge	A	26	455	Park & Ride, Turnpike Rd	C	7	45
Kibby Equipment	A	24	341	Montshire Road	C	41	44
VA Hospital	A	12	334	A Street	C	26	42
Haven NB	A	26	326	Stoney Creek	C	26	42
S. Main & Mountain Ave	A	12	310	Hartford PO, Opp.	C	26	41
US 5 @ Co-op	B	26	253	Wilder Motel	C	26	39
U.S. 5 @ Lukoil	B	12	243	Twin River Clinic	C	12	39
Datamann, Opp.	B	26	219	Heritage Lane	C	7	36
Shady Lawn	B	26	213	Hemlock Ridge, Opp.	C	26	34
Greyhound	B	12	172	Cascadnac	C	26	32
Gilman Complex	B	12	150	Hazen Street	C	12	32
Datamann	B	26	147	US 5 @ Cota & Cota	C	26	31
Hartford Municipal Bldg	B	24	141	McKenna Road	C	44	30
Bridge St.	B	12	136	King Arthur Store	C	26	27
Valley Terrace	B	26	132	Cumberland Farms	C	26	27
Billings Farm Road	B	26	131	Moore Lane	C	7	27
Ravenwood	B	26	125	Carstore, Opp.	C	26	23
Trailer Park @ Sykes	C	12	112	Hemlock Ridge	C	26	13
Olcott Industrial Park	C	26	101	Cascadnac, Opp	C	26	12
Post Office	C	26	91	Tracy Hall	C	15	10
Hartford PO	C	26	91	Pleasantview Terrace	C	26	10
Depot St	C	26	88	Carstore	C	26	9
Chandler Road	C	26	85	Glen Ridge Rd	C	16	8
Shady Lawn, Opp	C	26	68	Mascoma, Holiday Dr	C	12	7
Park & Ride, Tafts Flats	C	26	67	Hazen Street & Cliff	C	12	0
Cumberland Farms, Opp.	C	26	64	Hazen Street & Main	C	12	0
DHL	C	26	55	Norwich Meadows	C	26	0
Billings Farm Rd, Opp.	C	26	54	Hopson Road	C	26	0
Fed Ex	C	26	54	Jericho	C	26	0

General Bus Stop Design Configurations

Bus Stop Configurations: Curbside, Turnout or Bus Bulb?

The following issues should be considered in the decision of whether a bus turnout is recommended in a particular location. There is no one-size-fits-all answer and each location should be evaluated by Advance Transit and the towns of Hartford and Norwich in consideration of the context of the bus stop. The majority of Advance Transit bus stops are curbside.

BUS OPERATIONS

Bus stop designs should provide for the bus system to maintain its schedule and efficient operations. Bus stop configurations that take more time for bus boarding, or for buses to re-enter traffic streams, can delay an entire schedule. With a dynamic system, such as Advance Transit's, it is important for all buses to keep on schedule to allow the critical transfers between routes. When a passenger misses their transfer, it could mean a one hour delay in their trip. If one bus is running late due to traffic congestion, it can delay all the other bus routes as they wait for connections (like a cascading effect similar to a canceled or delayed flight to a connecting flight network). Providing well designed bus stops that allow for efficient operations of the bus system is important. Given the high cost of running a bus system, it makes sense to prioritize operating at the greatest level of efficiency.

SAFETY

There are a variety of important safety considerations in design and location of bus stops. Bus stops should be designed to minimize potential traffic conflicts. There has been ample research and study of the optimal bus stop configurations for different types of traffic flow environments, with the following conclusions:

- In higher speeds (over 40 mph traffic speeds), and in less congested environments, bus turnouts are appropriate, in order to reduce conflicts with oncoming traffic.
- In lower speed settings, the bus stopping in the street generally results in minimal risk of crashes.

On congested streets, buses in a turnout may have difficulty finding a sufficient gap in traffic to re-enter the traffic stream, requiring more risky maneuvers or aggressive driving, on the part of the bus driver in order to maintain the system schedule. Requiring bus turnouts on a slow moving, congested street is putting bus drivers in a difficult situation that can more likely to result in a crash. Usually, it is safer for all users to simply provide curbside bus stops, with buses blocking traffic for the short boarding and alighting period.

- There are a few special situations where bus turnouts should be built. This includes any location where there are more frequent users of the bus that require assistance boarding or alighting (e.g. senior housing, public housing, boarding with baggage), or where the buses dwell for a period to maintain their schedule or connections. In cases where a bus turnout is appropriate near a signalized intersection, the best location is on the far side of the intersection, so that gaps are created during the red light phase for the bus to safely re-enter traffic.

BUS STOP CONFIGURATIONS

There are a variety of bus stop configurations, with the following sections describing some of the features of each. While the examples noted all assume that the bus stops are on streets with sidewalks, this is often not true of Advance Transit stops, so actual conditions are not always described by the examples below.

CURBSIDE BUS STOPS

The curbside bus stop is by far the most common bus stop configuration on the Advance Transit system. The bus stops along the curb and typically blocks the travel lane while passengers board and alight. In cases where there is parallel parking, however, the curbside stop may occur in a “no parking” zone adjacent to parallel parking spaces. In these cases, a curbside stop allows the bus to be out of moving traffic. Curbside stops are accommodated into the normal flow of traffic, can be integrated easily within most street design schemes, and are used most effectively when traffic speeds are lower than 45 mph.

TURNOUTS OR PULLOFFS

Some bus stops are designed to allow the bus to pull out of traffic in areas where there is not parallel parking on the street. These are found in some locations on the Advance Transit system such as Stoney Creek.

The bus turnout allows general traffic to pass around a loading bus and interferes less with right-turning vehicles at during boarding and alighting.

FIGURE 18: STONEY CREEK BUS STOP
Image: TRORC Staff

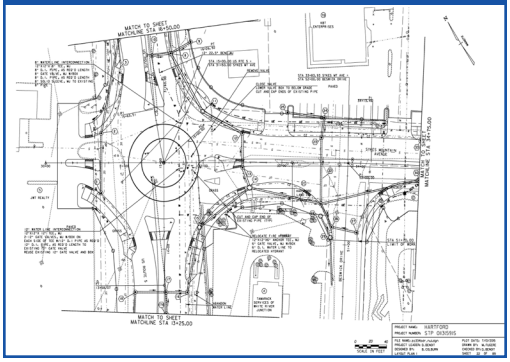
The TRB indicates that the following are advantages of bus bulb outs:

- Provides buses with access to the curb from the travel lane without deviation (no pulling in or merging) thereby reducing dwell time;
- Provide patron waiting and boarding areas separated from pedestrian movements on sidewalks;
- Provide room for stop amenities or other streetscape features;
- Visually designate a street as a pedestrian friendly transit corridor.

ROUNDABOUTS

There are two intersections on Sykes Mountain Avenue/US5 and Sykes Mountain Avenue/Holiday Drive in Hartford where roundabouts are being planned for improved traffic circulation. These will be along the Orange Route. Roundabouts can offer a number of advantages over signals, including higher vehicle capacity, lower accident rates, and reduced traffic speeds. They can easily accommodate transit vehicles but some care needs to be taken in locating bus stops near roundabouts. The most important consideration is to make sure that the roundabout exits are not impeded by a bus stopping in the travel lane, as gridlock can quickly form at a roundabout when an exit point is blocked. Bus stops can be located either on the near side or far side of a roundabout.

FIGURE 19: SYKES MOUNTAIN AVE ROUNDABOUT SITE PLANS
Image: Town of Hartford

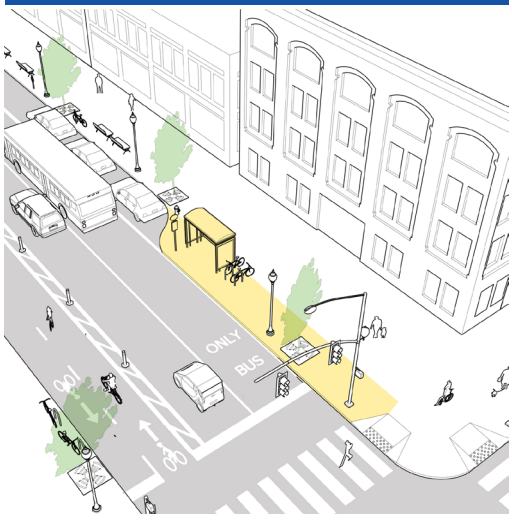


BUS CURB EXTENSIONS/BULB OUTS

A curb extension (or "bus bulb") is a modification of the sidewalk to extend the bus loading/waiting area into the roadway. Because a curb extension can be as short as 15 feet, it can conserve curbside space for parking relative to a curbside stop with a bus zone. It is most effectively used when travel speeds are lower than 30 mph, where pedestrian volumes are high, or where the sidewalk is narrow and additional waiting space is required.

The curb extension provides a larger waiting area for passengers (to accommodate a shelter, for example), with less interference with pedestrians on the sidewalk, and can also serve as a pedestrian amenity by shortening the crossing distance. Curb extensions are most appropriate for near-side stops where there are parking lanes or multiple travel lanes.

FIGURE 20: EXAMPLE OF BUS BULB OUT
Source: www.nacto.org



A bus bulb out is a curb extending to the side of the travel lane, and provides for curbside bus loading in an area where there is parallel parking present.

In this case, the bus will block traffic during boarding and alighting. Advance Transit currently does not have any bulb out bus stops.

Transit Vehicle Characteristics

The basic dimensional characteristics of the transit vehicles form a foundation for the bus stop designs in terms of dedicating adequate curb space to the bus stop. Advance Transit's fleet that serves the Green/Orange/Brown fixed route service are smaller buses called Internationals (Figure 21). These buses are 34-feet long and 96-inches (8 ft.) wide and have one door for boarding and alighting.

There are stairs at the door and a wheelchair lift behind the door. The buses have a fold down bike rack on the the intersection. It can be effectively incorporated into a site design where high-volume loading is anticipated,

FIGURE 21: ADVANCE TRANSIT'S INTERNATIONAL BUS FLEET
Image: Advance Transit, Chris Andreasson, 2016

such as an apartment complex. Typical dimensions are 170 feet long by 10 feet wide.

Sidewalks

Sidewalks and the bus stop landing pad area a core element of every bus stop. In general, bus stops should be well-connected into the surrounding neighborhood by sidewalks that enable passengers a safe and attractive travel route to and from the stop as illustrated in Figure 22. Safe and attractive sidewalk connections to transit stops help encourage transit use.

- WIDTH: Sidewalks should be a minimum of 5-feet wide for accessibility. This should be viewed as a minimum standard for areas with light pedestrian traffic. In spatial terms, a 5-foot sidewalk is wide enough for two people to walk abreast. Passing a pedestrian walking in the opposite direction, or a few people waiting at a bus stop, requires an awkward maneuver to make space on a 5-foot wide sidewalk.

  Areas with higher pedestrian volumes, such as the busier transit stops, neighborhood retail areas, the front of public buildings and other public gathering places, sidewalks should be wider, 10-, 15- and even 20-feet in width to comfortably accommodate both pedestrian traffic and transit patrons.

- BUFFER ZONES: Where possible, a buffer zone between the sidewalk and the curb is desirable to buffer pedestrians from the proximity of motor vehicles and the attendant

noise, exhaust and splashing associated with traffic. A planted area with trees is ideal as trees provide many environmental benefits and provide shade and amenity for pedestrians, passerby and transit patrons. Street trees also provide a vertical element and sense of enclosure along the street which helps to calm and slow traffic and make the street more pedestrian friendly. Shrubs which block the view of pedestrians around the bus stop, on the other hand, should be avoided.

- LANDING PAD: As described in the Accessibility Guidelines above, at the bus stop, there must be a 5-foot wide by 8-foot length from the curb edge landing pad through the planted area for bus boarding and alighting. The landing pad must be connected to the sidewalks.
- SIGHT DISTANCE: This is a consideration for the bus stop as a whole, and the crosswalk in particular, but adequate sight distance should be provided for stopped buses and pedestrian crossings. Obstructions to sight distances typically include hills, curves in the roadway, signage, landscaping and parked cars.
- CROSSWALK CONFIGURATION: Marked crosswalks are typically used to identify preferred locations for pedestrians to cross a road. Crosswalks should be at least 5-feet and ideally 15-feet behind the bus for pedestrian visibility.

According to the 2015 Vermont Agency of Transportation Guidelines for Pedestrian Crossing Treatments, at uncontrolled approaches (intersection or mid-block):

- Speed limit 40 mph or less
- Adequate sight distance from all vehicular approaches to both ends of the crossing

TABLE 8: ADEQUATE SIGHT DISTANCE
Source: 2015 VTrans Guidelines for Pedestrian Crossing Treatments

POSTED SPEED (MPH)	REQUIRED SIGHT DISTANCE (FEET)*
25	155
30	200
35	250
40	305

- No other crosswalk within 200 ft
- Vehicle volume exceeds 3000 vehicles per day (both directions combined)
- Pedestrian crossing volume exceeds 20 per hour in the highest pedestrian hour of the day (Elementary school age – 12 and under and elderly pedestrians – over 60 - count as 2 each)
- No parking within 20 feet of crosswalk (unless crosswalk is located mid-block with bulb-outs)

Depending on the nature of the roadway, specifically traffic volumes, speeds, number of lanes, marked crosswalks may need to be enhanced with other treatments to create a safer pedestrian crossing. These may include:

- Pedestrian refuge islands
- Pedestrian signals

- Tighter curb radii
- Narrowed lanes
- Curb extensions or bulb outs
- Pedestrian warning signs

Signage

At a very minimum, each bus stop should be clearly marked with a sign. The following features of an effective bus stop signage are recommended:

- Signs should be visible to pedestrians from both directions along the street. For example, double-sided signs hanging from a bracket work well. Many stops are marked only with a conventional one-sided traffic signage, so pedestrians approaching the stop from the downstream traffic directions cannot see the bus stop sign until they pass it.
- The signs should include information about which routes stop there. This could be accomplished by supplementing existing signs with durable stickers of each color (Brown, Green or Orange).

Signage options are numerous and over time, Advance Transit could consider establishing separate sign posts, updated sign design and more information signs as illustrated in the bus stop sign example from Minneapolis MetroTransit (Figure 23).

FIGURE 22: SIDEWALK ALONG SANDERS BUS STOP
Image: TRORC Staff

FIGURE 23: BUS STOP SIGNAGE FROM MINNEAPOLIS METROTRANSIT
Image: Minneapolis MetroTransit

Bus Shelters

The current Advance Transit shelters are both attractive and durable, and work well in most cases to provide shelter for waiting passengers. Another important factor is that the shelter should be transparent to ensure that bus drivers can see bus patrons waiting at the bus stop. There are some communities that have developed custom designed shelters to match surrounding street furniture and the visual characteristics of the community. Building custom shelters can help create a unique identity particularly for central stops where ridership and the surrounding context warrant special treatment. White River Junction, Wilder and Norwich are all examples of areas where the bus shelter could be designed to match the local atmosphere and architecture of the area.

Figures 24 and 25 provide a few examples of shelters built by other agencies in prominent locations comparable to the Advance Transit service areas in Vermont.

FIGURE 24: BUS SHELTER AT UNIVERSITY OF VERMONT
Image: UVM

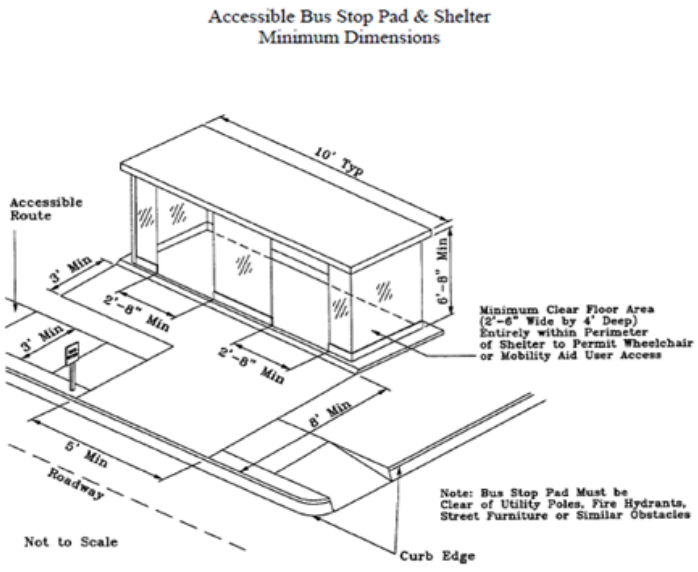
FIGURE 25: CCTA SHELTER, BURLINGTON
Image: City of Burlington

Accessibility Guidelines

Bus stops must be designed to be usable by persons with disabilities. The following summarizes the accessibility guidelines for general planning purposes:

- The bus stop boarding area should be 13 feet wide, allowing for the 8 foot wide vehicle plus a 5 foot wide alley for accessing the side of the bus.
- Access between the bus boarding area and the sidewalk should not require any movement in a traveled way of a road.
- The landing area must be a firm stable and slip resistant surface. Concrete is the preferred surface for the landing area.
- Connect waiting and boarding area to a PAR (pedestrian accessible route, i.e., sidewalk) that is a minimum of 5 feet in width.
- If there is a bench, provide a 30-inch by 48- inch clear approach area adjacent to the bench and connected to the bus boarding and alighting area.
- Maintain a clear area of 30 inches by 48 inches entirely within the perimeter of the shelter.
- Keep signage and other obstructions (i.e. bike racks, trash receptacles, overhanging branches) from

FIGURE 26: MINIMUM SHELTER DIMENSIONS
Source: TRB TCRP Report 19, www.nacto.org



protruding into the clear approach areas and pedestrian accessible route.

- Provide raised and Braille characters for route identification only (schedules, timetables, and maps are not required to have raised and Braille characters).
- For all signage (including schedules, timetables, and maps) comply with current ADA Accessibility Guidelines (ADAAG) for finish and contrast, case, style, character proportions and spacing, and stroke thickness.

Bus stop designers are directed to ADAAG for further guidance on accessible design criteria. Figure 26 illustrates minimum shelter dimensions for clearance.

Along more rural roads which do not have sidewalks, a raised bus stop pad which elevates the waiting area above the grade of the road addresses both safety and accessibility concerns at these locations. As many of the existing bus stops do not fully meet these requirements, they should be considered as future street and sidewalk improvements are conducted by the towns of Hartford and Norwich.

Pedestrian Crossings and Safety

There is a growing concern among transit agencies to consider the pedestrian safety of transit stops, as patrons generally access bus stops as pedestrians.

In order for a passenger to use a bus stop for a round trip, such as commuting to and from work over the course of a day, it will almost certainly be necessary for the passenger to cross the street to the transit stop for one end of the trip.

Therefore, the pedestrian crossing opportunities are an important consideration in locating and design of transit stops.

About half of the transit stop areas in the Hartford and Norwich have a good pedestrian environment with existing safe crosswalks conveniently located.

Bike Racks

Bus passengers may combine biking with riding the bus. Bike racks should be nearby the “A” level stops and placed at the other stops where a bicycle would extend the intercept to a bus stop as illustrated in Figures 27 and 28.

FIGURE 27: BIKE RACK AT KING ARTHUR FLOUR
Image: TRORC Staff

FIGURE 28: BIKE RACK AT TAFTS FLATS STOP
Image: TRORC Staff

Shelter Maintenance

One of the more significant issues that Advance Transit faces with ridership and continued quality of service are the maintenance of shelters dealing with litter and with snow build up during the winter season. Passenger feedback received during surveys includes disapproving litter like cigarette butts and garbage around the shelter. There are no trash bins at shelters nor does Advance Transit want to encourage trash bins in an effort to reduce shelter maintenance efforts. Efforts to remind passengers through marketing not to litter could help reduce litter at bus stops.

Winter maintenance at bus stops, particularly with bus shelters dealing with snow accumulation are a continued struggle that Advance Transit faces. In larger urban areas with public transit use, city maintenance crews are used to clear out shelters, however Advance Transit is not owned by a municipality. Currently Advance Transit drivers shovel snow accumulation at bus stops with shelters, not town highway departments. Shelters that are adjacent to sidewalks have town crews clear the sidewalks; however there still remain times where large snow piles in the grass buffer between the sidewalk and road exist. This pile impedes buses from pulling up and being able to board or alight passengers. Most times, the bus lets passengers off in the roadway where there is a clearing. Advance Transit should evaluate partnerships with the towns, businesses, residents through Adopt-A-Shelter program to assist with shelter winter maintenance.

FIGURE 29: SNOW BUILD UP BLOCKING ACCESS FROM SHELTER TO BUS
Image: Advance Transit

Conceptual Bus Stop Designs

The following sections discuss the bus stops for which more detailed design concepts were prepared. A list of recommendations for the remaining bus stops follows in Appendix A.

Bus stops considered for detailed design concepts were:

- Prospect Street
- VA Hospital Outpatient Entrance
- Hickory Ridge
- Luk Oil/US5
- VA Cutoff Bridge
- Across Datamann

118 PROSPECT STREET, HARTFORD

In 2014, a new state office building complex was built at 118 Prospect Street in White River Junction housing half a dozen state agencies' employees and clients. The building is just off US4 across from the Listen Center and from the newly constructed Route 4 bridge connecting Hartford, VT and Lebanon, NH. Prospect Street is also directly off the Orange and Green Route as they cross from Lebanon, NH.

Currently, the bus stop is in front of Kibby Equipment just beyond the rail underpass to the west of the state office complex (roughly 400 ft.). Initial discussions from the developer DEW Corp requested Advance Transit to divert routes to serve the state office complex, however after schedule and route analysis, it was determined that it would be more efficient to keep the bus stop along US4/ Maple Street.

Design plans in Figure 30 illustrate a bus turnout from US4 to a bus stop with an overhang from the corner building. The corner building has not been constructed yet. A turnout lane requires at least an 11 ft. width for the bus to safely pull out of the travel lane. The allotted travel lane width currently is 9 ft. at its widest point. This is an insufficient width to safely pull in and out of traffic (Figure 31).

FIGURE 30: PROSPECT STREET DEVELOPMENT SITE PLANS
Image: DEW Corporation

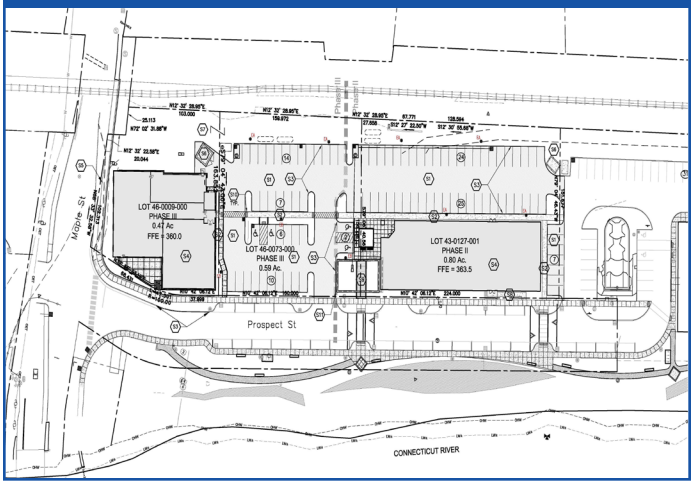


FIGURE 31: EXISTING PULL OFF DIMENSIONS ON MAPLE AVE/US4
Image: TRORC Staff

FIGURE 32: PERSPECTIVE OF OPTIMAL DESIGN OF BUS PULL OFF
Image: TRORC Staff

Key Issues

Bus Turnout on US4:

- Bus turnout travel width needs to expand from 9 ft. to at least 11 ft. but the travel width is in DEW Corp right-of-way
- Need to move grass buffer and sidewalk towards building 3
- Grass buffer is important to the Town of Hartford DPW for snow removal capacity
- Bus currently can not safely pull a bus into the existing travel width configuration
- Rail underpass is 79 ft. from Prospect Street intersection creating a tight distance for a bus to pull back into traffic and travel under the underpass

Next Steps

- DEW Corp constructs buildings with continued discussion with Advance Transit
- Advance Transit will continue to serve Kibby Equipment stop until turnout width conditions have been improved

VA HOSPITAL OUTPATIENT ENTRANCE, HARTFORD

The VA hospital is served by multiple public transit providers in the region. The current bus stop at the VA outpatient entrance (Building 39) is along the Veterans Drive in the traffic circulation lane. The buses are unable to drive up to the outpatient entrance as the overhang clearance is at 9 feet 5 inches and the buses require at least 12 feet clearance (Figure 32). Transit patrons are required to walk across a travel lane and through a row of handicapped parking to be able to board on and off the buses.

When traffic becomes busy, transit patrons unfamiliar with where the bus stops may not see the bus when it pulls up alongside the row of handicapped parking. There is no bus stop signage to indicate where the bus will stop (Figure 34).

There are some alternatives that the VA could consider which can improve the accessibility to and from the building. See Figures 35 through 39, page 39.

FIGURE 33: EXISTING CONDITIONS AT BUILDING 39 ENTRANCE
Image: TRORC Staff

FIGURE 34: EXISTING VA BUS STOP CONDITIONS
Image: TRORC Staff

Key Issues

VA Building 39 Entrance:

- Overhang clearance is too low for buses to pull up beside entrance
- Current bus stop is beside row of handicapped parking creating safety issues for passengers boarding and alighting
- Current bus stop has no bus stop signage to inform passengers where the bus will stop or that there is bus service
- Removing overhang is very costly
- VA has policy of maximum total impervious surface. VA is currently maxed on paved surfaces

VA HOSPITAL OUTPATIENT ENTRANCE DESIGN OPTIONS

Option A

Paint crosswalk to location where bus currently stops and paint pedestrian waiting area

Pros:

> Lowest cost option

> Provides better protection for pedestrian than current setup

Cons:

> Not as safe for pedestrians, still have to maneuver through traffic

> No weather protection

> Lose two parking spaces: one handicap and one regular space

FIGURE 35: PAINT CROSSWALK TO LOCATION BUS CURRENTLY STOPS
Image: TRORC Staff

plan

perspective

Option B

Paint crosswalk to location of current bus pickup, install proper bus shelter

Pros:

> Provides safer route to bus stop than current setup

> Provides weather protection at bus shelter

> Medium cost option

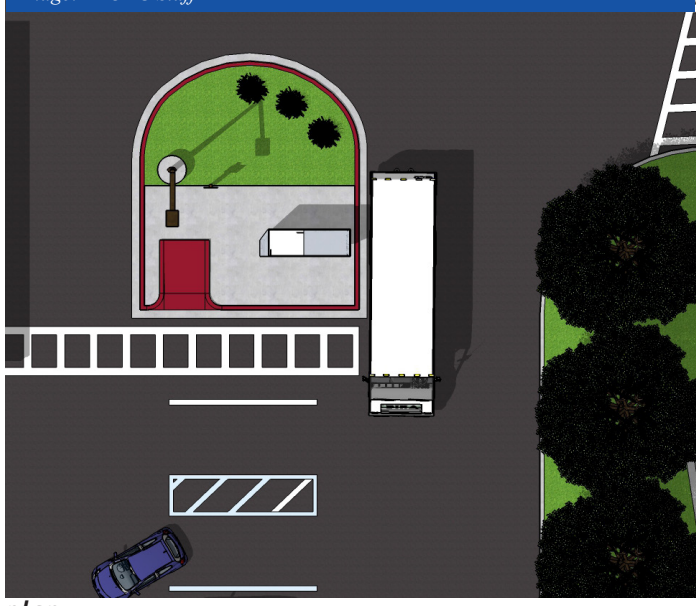
Cons:

> Disruption of traffic circulation and access to Building 39 entrance during construction

> Not as safe for pedestrians, still have to maneuver through traffic

> Lose two parking spaces: one handicap and one regular space

FIGURE 36: PAINT CROSSWALK TO LOCATION OF CURRENT BUS PICKUP, INSTALL BUS SHELTER
Image: TRORC Staff



plan

perspective

Option C

Paint crosswalk to location of current bus pickup, provide crosswalk canopy, install proper bus shelter

Pros:

> Provides safer route to bus stop than current setup

> Provides weather protection from building and at bus shelter

> Medium cost option

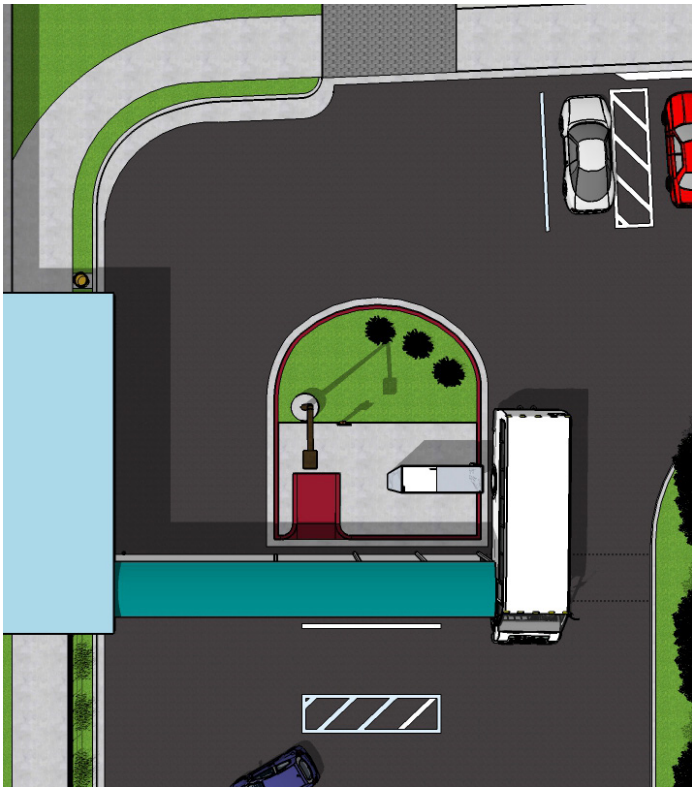
Cons:

> Disruption of traffic circulation and access to Building 39 entrance during construction

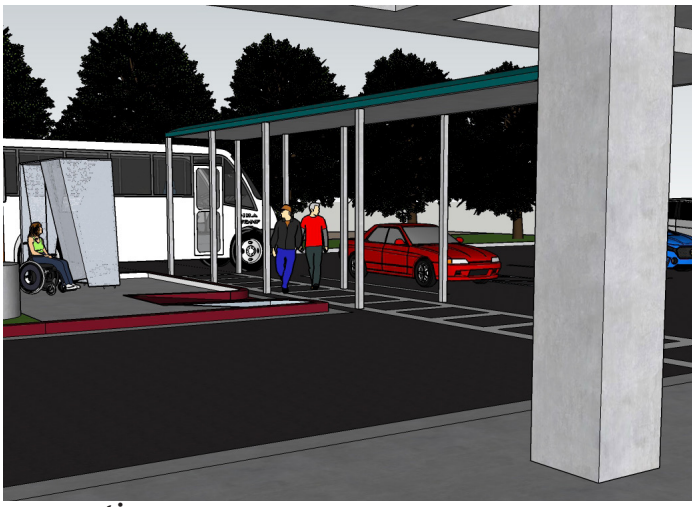
> Not as safe for pedestrians, still have to maneuver through traffic

> Lose two parking spaces: one handicap and one regular space

FIGURE 37: PAINT CROSSWALK TO LOCATION OF CURRENT BUS PICKUP, PROVIDE CROSSWALK CANOPY, INSTALL BUS SHELTER
Images: TRORC Staff



plan



perspective

Option D

Remove part of entrance overhang

Pros:

> Allows bus to pull up to existing entrance

> Protects pedestrians from traffic and weather

> Allows room for vehicles to pass on left

> No parking spaces lost

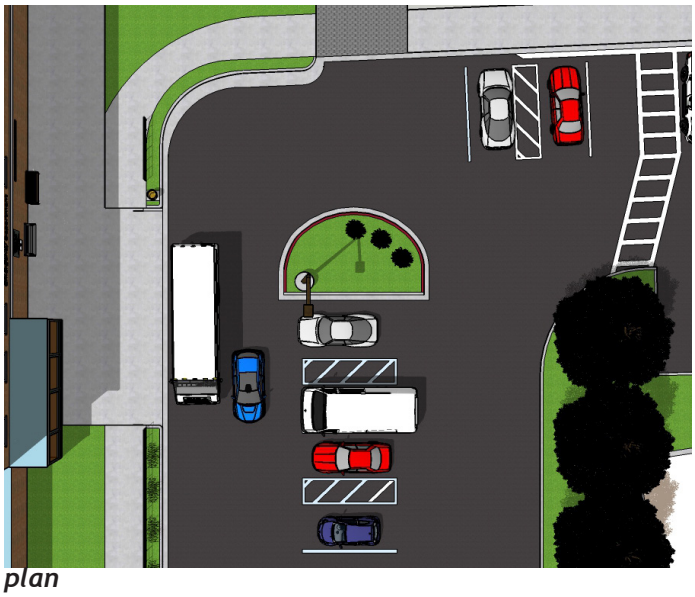
> Traffic flow stays as originally intended

Cons:

> Higher cost option

> Disruption of traffic circulation and access to Building 39 entrance during construction

FIGURE 38: REMOVE PART OF ENTRANCE OVERHANG
Images: TRORC Staff



plan

perspective

Option E

Remove entire entrance overhang

Pros:

> Allows bus to pull up to existing entrance

> Protects pedestrians from traffic and weather

> Allows room for vehicles to pass on left

> No parking spaces lost

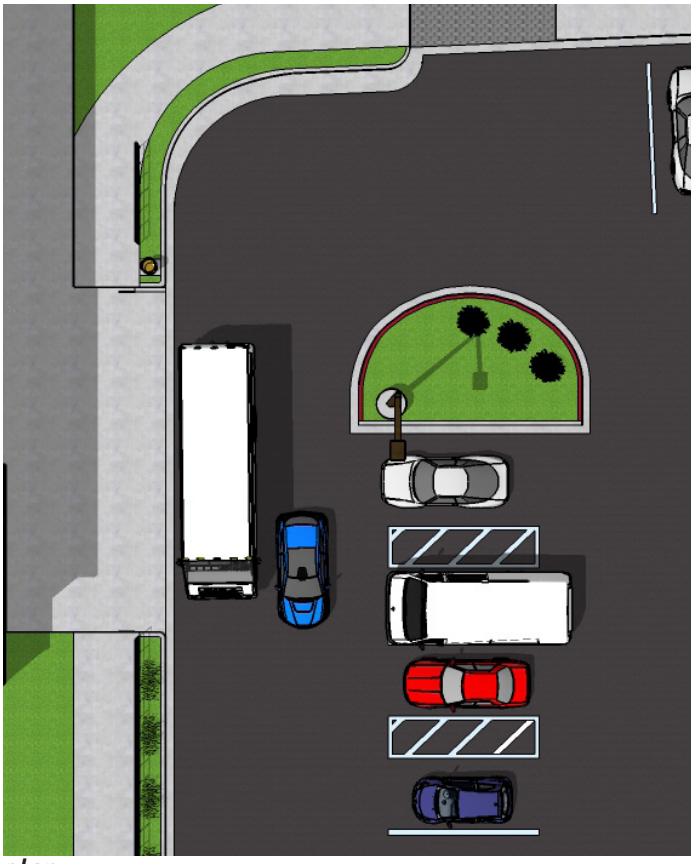
> Traffic flow stays as originally intended

Cons:

> Higher cost option

> Disruption of traffic circulation and access to Building 39 entrance during construction

FIGURE 39: REMOVE ENTIRE ENTRANCE OVERHANG
Images: TRORC Staff



plan

perspective

Option F

Reconfigure the traffic circulation pattern for improved efficiency

Pros:

> Pedestrian safety considered

> Weather protection considered

> Improved traffic circulation and safety for buses, vehicles and pedestrian flow in area

> Canopy left as is

> Weather protection considered

Cons:

> Higher costs

> Significant disruption of traffic circulation and access to Building 39 entrance during construction

> May lose more parking spaces in the area

Option G

Reconfigure the entire front parking lot and traffic circulation pattern for improved efficiency*

Pros:

> Pedestrian safety considered

> Weather protection considered

> Improved traffic circulation and safety for buses, vehicles and pedestrian flow in area

> Canopy left as is

> Weather protection considered

Cons:

> Higher costs

> Significant disruption of traffic circulation and access to all building entrances during construction

> May lose more parking spaces in the area

**the VA has a policy of maximum total impervious surface and the VA is currently at its maximum of paved surfaces. The VA may consider reconfiguring the entrance.*

Next Steps

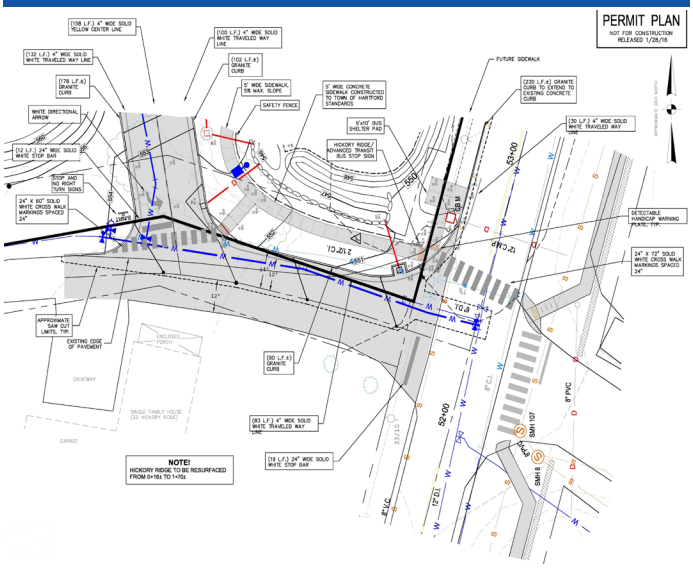
> Present VA with options in report

> Advance Transit will continue serving Building 39 entrance

> Advance Transit will continue discussion and coordination with the VA on short term improvements to current stop regarding signage and service visibility

FIGURE 40: EXISTING HICKORY RIDGE BUS STOP
Image: TRORC Staff

FIGURE 41: HICKORY RIDGE DEVELOPMENT SITE PLANS
Image: Black Rock Investments, LLC



HICKORY RIDGE, HARTFORD

Hickory Ridge is a residential road off of Sykes Mountain Avenue in White River Junction. The current bus stop at this location is a Level C with just a bus stop sign and averages 45 boardings a month.

A recently approved proposal for a multi-family development includes 88 dwelling units in four buildings at the corner of Sykes Mountain Avenue and Hickory Ridge. A design for the bus shelter is placed facing Sykes Mountain Avenue with a sidewalk leading from the development. There are no issues identified.

Next Steps

- Construction is planned for 2017-18
- Advance Transit will continue coordination discussions with the developer and the Town of Hartford on the bus stop design

LUK OIL/US5, HARTFORD

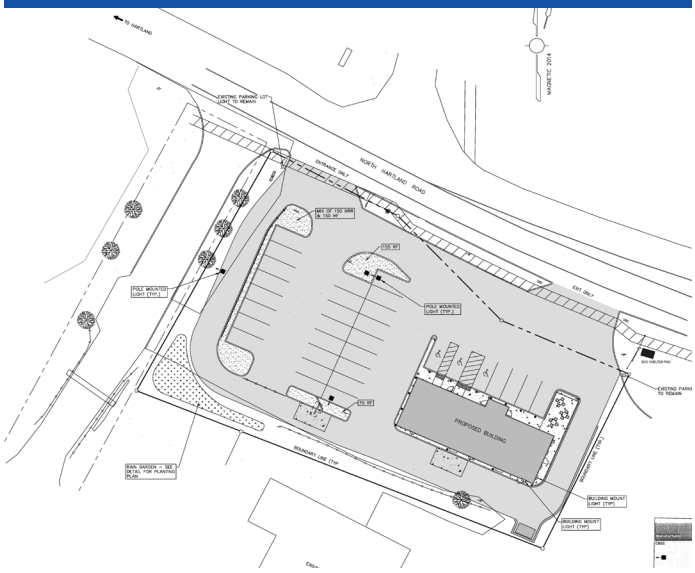
The current bus stop at Luk Oil is at a vacant Sunoco gas station. This parcel was recently approved by the Hartford Planning Commission for demolishing the old gas station pumps and a new Dunkin Donuts eatery with seating for 52 guests will be built in 2017-2018. The current plans are in discussion with the Vermont Agency of Transportation on driveway permit access.

The goal of this development is to tie into future town plans for a sidewalk connection from the Aquatic Center to Sykes Mountain Avenue along US5.

The recommendation for this bus stop is to include a new bus shelter and link to the sidewalk on US5 which will be constructed in 2017. The bus shelter will be installed when the sidewalk is constructed. There are no issues identified.

FIGURE 42: EXISTING LUK OIL BUS STOP
Image: TRORC Staff

FIGURE 43: LUK OIL DEVELOPMENT SITE PLANS
Image: Pathways Consulting, LLC



Next Steps

> Advance Transit will continue coordination discussions with the developer and the Town of Hartford on the bus stop design when the town sidewalk project along US5 is constructed

The Green Route bus previously used the Hartford Library parking lot to turnaround and reverse service direction. In the fall of 2015 after input from the Hartford Library Trustees, it was requested that Advance Transit divert the bus from the parking lot due to safety and pavement maintenance issues. The Green Route now uses Park Street, Summer Street and Elk Street to turnaround.

FIGURE 44: EXISTING VA CUTOFF BRIDGE BUS STOP
Image: TRORC Staff

FIGURE 45: PERSPECTIVE OF IMPROVED BUS STOP WITH SIDEWALK AND TURNOUT SURFACE TREATMENT
Image: TRORC Staff

VA CUTOFF BRIDGE, HARTFORD

The VA Cutoff Bridge stop is the one of the highest boarding stops along the Green Route on the Vermont side averaging 455 boardings a month. This location accesses Hartford Village along VT14 and is the most western stop.

This bus stop location is next to a pedestrian crosswalk and has an existing shelter. The only recommendation for this stop is to improve the gravel bus turnout with an impervious surface with (or without) curbing. This will improve the ADA accessibility to and from the shelter and boarding on and off the bus. A smooth surface should also be constructed to connect the crosswalk to the shelter. There are no issues identified.

Next Steps

- Advance Transit will continue coordination with the Town of Hartford on surface improvements

ACROSS DATAMANN, HARTFORD

The bus stop opposite of Datamann on the Green Route averages 219 boardings a month. There is no sidewalk leading to or from the stop and the only amenity is a bus stop sign and schedule. The bus pulls onto the gravel shoulder to board and alight passengers.

Key Issues

Opposite Datamann Stop:

> Current parcel is planned for residential redevelopment but is currently a Brownfield site requiring some minor clean up

> No sidewalks leading to and from the current bus stop to connect to the rest of the village sidewalk network

Next Steps

> Advance Transit will continue coordination with the Town of Hartford and developer on the bus stop design

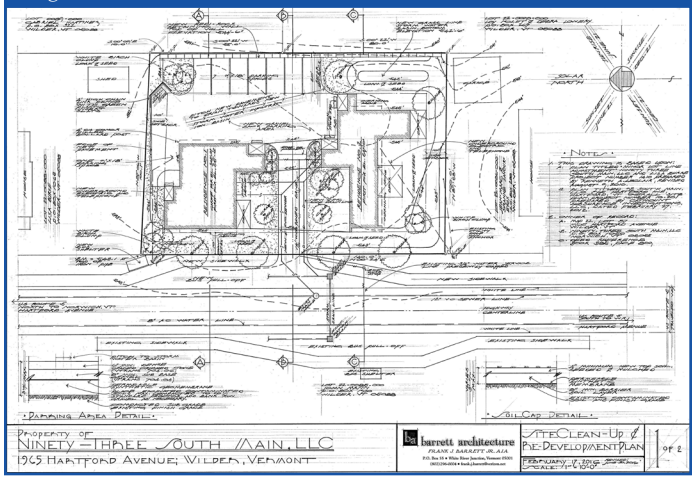
> Construction expected in 2017-2018

In February 2016, there was a discussion between Green Mountain Economic Development Corporation and Barrett Architecture of redeveloping this vacant site called the Tip Top Tire lot into four residential housing units (2 duplexes).

Barrett Architecture is currently working on design site plans which will incorporate a bus shelter and bus pull off to mirror the southbound Datamann bus stop across the street. Plans to develop a residential housing lot are still in infancy as this site is considered a Brownfield and would require some minor clean up treatments prior to construction.

FIGURE 46: EXISTING ACROSS DATAMANN BUS STOP
Image: TRORC Staff

FIGURE 47: EXISTING ACROSS DATAMANN BUS STOP
Image: Barrett Architecture



Bus Stop Design Considerations for Future Evaluation

BILLINGS FARM ROAD, HARTFORD

This bus stop location on the Green Route heading northbound to Hanover, NH averages 131 boardings a month. This stop serves multiple businesses including Norwich Regional Animal Hospital, King Arthur Flour offices, Advance Transit's offices, Community College of Vermont and a health services complex. The bus currently pulls off US5 and blocks the Billings Farm Rd intersection to board and alight passengers. This stop has been identified to install a bus shelter to improve the passenger experience and safety. There are some identified challenges such as where the boundaries of the State Right of Way are located and underground utilities connecting a utility box is near the vicinity of where the shelter would be installed.

FIGURE 48: EXISTING BILLINGS FARM RD BUS STOP
Image: TRORC Staff

Key Issues

> Bus stop located at an intersection, challenging for buses to pull over out of travel lane but also in front of turning lane

> Need shelter

> State Right of Way boundary is unclear

> Underground utilities may impact shelter location

Next Steps

> Need engineering plans to install a shelter at the intersection of Billings Farm Road and US5

> Work with Town of Hartford to improve intersection to accommodate bus shelter

Key Issues

- Bus stop located at an intersection, challenging for buses to pull over out of travel lane but also in front of turning lane
- Need shelter
- State Right of Way boundary is unknown
- Narrow roadway

Next Steps

- Need engineering plans to install a shelter at the intersection of Olcott Drive and US5
- Work with Town of Hartford to improve intersection to accommodate bus shelter

OLCOTT DRIVE, HARTFORD

The Olcott Drive bus stop on the Green Route heading northbound to Hanover, NH faces similarities to Billings Farm Rd. The bus stop provides access to Olcott Industrial Park averaging 101 boardings a month. The bus currently pulls out of US5 traffic and blocks Olcott Drive to board and alight passengers. A shelter has been identified for installation to improve passenger experience but will require additional engineering to determine State right-of-way and shelter location. Figure 49 illustrates passengers waiting for the bus by sitting on the grass which is not feasible during the winter season.

FIGURE 49: EXISTING OLCOTT DRIVE BUS STOP
Image: TRORC Staff

VETERAN'S PARK, HARTFORD

The Veteran's Park stop on the Orange Route averages 136 boardings a month. The stop only has a bus stop sign currently but the unique feature of this stop is that it is next to the Veteran's Memorial Park which has a historic gateway kiosk. The kiosk itself is in poor condition and will require replacement in the future. Advance Transit has recognized a potential partnership with the Town of Hartford envisioning a new bus stop with a bus shelter designed to incorporate the Veteran's Memorial Park historic information and become the new gateway feature.

FIGURE 50: EXISTING VETERAN'S PARK BUS STOP
Image: TRORC Staff

Key Issues

> Bus stop located at an intersection, challenging for buses to pull over out of travel lane but also blocking Railroad Row

> A historic kiosk is aging and will need replacement

Next Steps

> Need design/ engineering for a new shelter design to incorporate a historic kiosk to replace existing historic marker

> Work with Town of Hartford to improve bus stop shelter design

List of Tables

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Appendix A: Full Bus Stop Inventory

BROWN ROUTE BUS STOPS

McKenna Road

Route(s):	Brown/Green			Traffic Volume:	12,500
		Buses per Day:	44		
Headway:	30 minutes	Avg. Monthly Boardings:	30	Traffic Speed:	25
Street:	VT10A	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	Yes		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Tracy Hall

Route(s):	Brown			Traffic Volume:	2,500
		Buses per Day:	15		
Headway:	30 minutes	Avg. Monthly Boardings:	10	Traffic Speed:	25
Street:	Main Street	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	Yes		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No	Crosswalk in winter time is icy.	

Hazen Street

Route(s):	Brown			Traffic Volume:	250
		Buses per Day:	12		
Headway:	30 minutes	Avg. Monthly Boardings:	32	Traffic Speed:	25
Street:	Hazen Street	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	Yes	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Hazen + Cliff

Route(s):	Brown			Traffic Volume:	250
		Buses per Day:	12		
Headway:	30 minutes	Avg. Monthly Boardings:	0	Traffic Speed:	25
Street:	Hazen Street	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No	Recommend removal of stop	

Hazen + Main

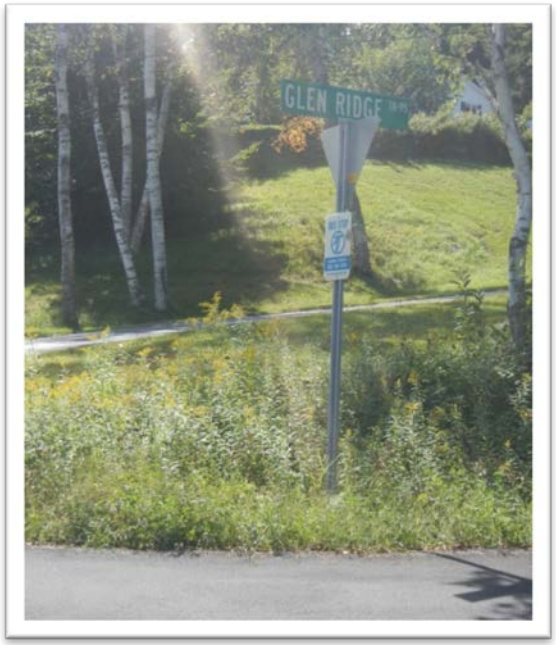
Route(s):	Brown			Traffic Volume:	250
		Buses per Day:	12		
Headway:	30 minutes	Avg. Monthly Boardings:	0	Traffic Speed:	25
Street:	Hazen Street	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	Yes		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Park + Ride, Turnpike Road

Route(s):	Brown			Traffic Volume:	500
		Buses per Day:	7		
Headway:	30 minutes	Avg. Monthly Boardings:	45	Traffic Speed:	25
Street:	Turnpike Road	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	Yes	Should reverse shelter orientation, turnaround challenge if lot is full	
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Moore Lane

Route(s):	Brown			Traffic Volume:	250
		Buses per Day:	7		
Headway:	30 minutes	Avg. Monthly Boardings:	27	Traffic Speed:	25
Street:	Moore Lane	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	Yes		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		



Glen Ridge Road

Route(s):	Brown			Traffic Volume:	400
		Buses per Day:	7		
Headway:	30 minutes	Avg. Monthly Boardings:	8	Traffic Speed:	25
Street:	Beaver Meadow Road	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Heritage Lane

Route(s):	Brown			Traffic Volume:	400
		Buses per Day:	7		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	36	Speed:	25
Street:	Beaver Meadow Road	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

2nd busiest stop on Brown

Dan + Whits

Route(s):	Brown			Traffic Volume:	2,500
		Buses per Day:	18		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	448	Speed:	25
Street:	Main Street	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	Yes	Crosswalks:	Yes		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Drivers unwilling to yield to buses back into traffic

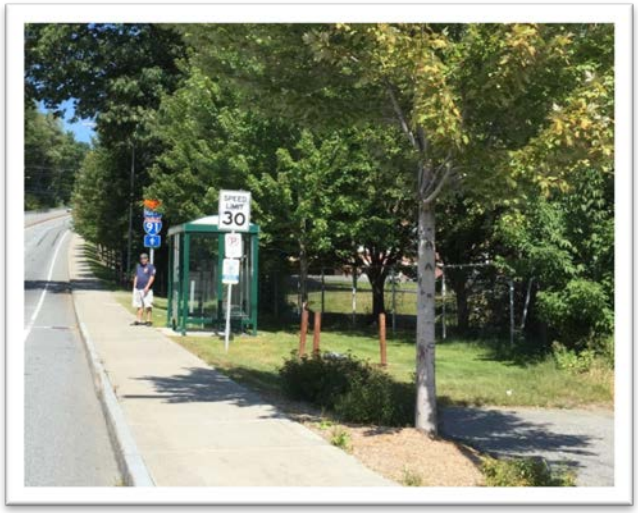
Montshire Road

Route(s):	Brown/Green			Traffic Volume:	12,500
		Buses per Day:	41		
Headway:	30 minutes	Avg. Monthly Boardings:	44	Traffic Speed:	25
Street:	VT10A	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	Yes		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No	Challenging to merge back into traffic	

GREEN ROUTE BUS STOPS - NORTHBOUND

Kibby Equipment

Route(s):	Green/Orange			Traffic Volume:	10,500
		Buses per Day:	36		
Headway:	30 minutes	Avg. Monthly Boardings:	341	Traffic Speed:	25
Street:	VT14	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		



US5 @ Co-Op

Route(s):	Green			Traffic Volume:	6,500
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	253	Traffic Speed:	30
Street:	US5	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	Yes	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

The Haven

Route(s):	Green			Traffic Volume:	6,500
		Buses per Day:	26		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	326	Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	Yes	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Knights Funeral

Route(s):	Green			Traffic Volume:	6,500
		Buses per Day:	26		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	52	Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Cumberland Farms

Route(s):	Green			Traffic Volume:	6,500
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	27	Traffic Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

A Street

Route(s):	Green			Traffic Volume:	6,500
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	42	Traffic Speed:	30
Street:	US5	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Depot Street

Route(s):	Green			Traffic Volume:	6,500
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	88	Traffic Speed:	30
Street:	US5	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Datamann, Opposite

Route(s):	Green			Traffic Volume:	4,800
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	219	Traffic Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	Needs shelter
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

FedEx

Route(s):	Green			Traffic Volume:	4,000
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	54	Traffic Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Wilder Motel

Route(s):	Green			Traffic Volume:	3,400
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	39	Traffic Speed:	30
Street:	US5	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Billings Farm Road

Route(s):	Green			Traffic Volume:	4,900
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	131	Traffic Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	Needs shelter
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Hemlock Ridge, Opposite

Route(s):	Green			Traffic Volume:	4,900
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	34	Traffic Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Olcott Drive

Route(s):	Green			Traffic Volume:	4,900
		Buses per Day:	26		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	101	Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	Needs
Shelter:	No	Crosswalks:	No		shelter
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

King Arthur Flour

Route(s):	Green			Traffic Volume:	4,100
		Buses per Day:	26		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	27	Speed:	30
Street:	US5	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	Yes	Crosswalks:	No		
Bus Stop:	Curbside: Shoulder pull-off	Bike Racks:	Yes		

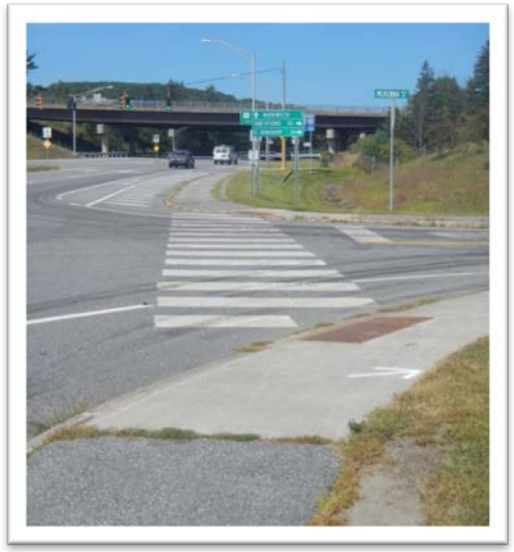
Car Store

Route(s):	Green			Traffic Volume:	4,100
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	9	Traffic Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Shoulder pull-off	Bike Racks:	No		

Montshire Road

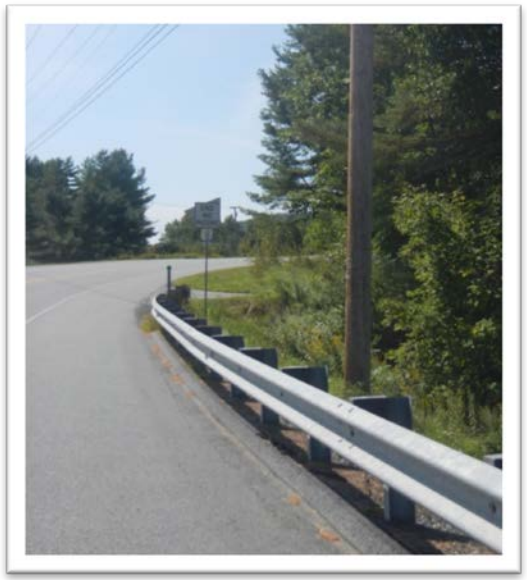
Route(s):	Brown/Green			Traffic Volume:	12,500
		Buses per Day:	41		
Headway:	30 minutes	Avg. Monthly Boardings:	44	Traffic Speed:	25
Street:	VT10A	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	Yes		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

GREEN ROUTE BUS STOPS - SOUTHBOUND



McKenna Road

Route(s):	Brown/Green			Traffic Volume:	12,500
		Buses per Day:	44		
Headway:	30 minutes	Avg. Monthly Boardings:	30	Traffic Speed:	25
Street:	VT10A	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	Yes		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		



Car Store, Opposite

Route(s):	Green			Traffic Volume:	4,100
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	23	Traffic Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Shoulder pull-off	Bike Racks:	No		

Norwich Meadows

Route(s):	Green			Traffic Volume:	3800
		Buses per Day:	26		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	0	Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Shoulder pull-off	Bike Racks:	No		

Hopson Road, Drop off only

Route(s):	Green			Traffic Volume:	4,900
		Buses per Day:	26		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	0	Speed:	25
Street:	US5	Accessibility:	No	Amenities:	
Sign:	No	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Shoulder pull-off	Bike Racks:	No		

Valley Terrace

Route(s):	Green			Traffic Volume:	4,900
		Buses per Day:	26		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	132	Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Shoulder pull-off	Bike Racks:	No		

Hemlock Ridge Dr

Route(s):	Green			Traffic Volume:	4,900
		Buses per Day:	26		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	13	Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Shoulder pull-off	Bike Racks:	No		

Jericho Street - Drop off only

Route(s):	Green			Traffic Volume:	4,900
		Buses per Day:	26		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	0	Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Shoulder pull-off	Bike Racks:	No		

Billings Farm Road, Opposite

Route(s):	Green			Traffic Volume:	4,900
		Buses per Day:	26		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	54	Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	Yes	Crosswalks:	No		
Bus Stop:	Curbside: Shoulder pull-off	Bike Racks:	No		

Stoney Creek

Route(s):	Green			Traffic Volume:	3,400
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	42	Traffic Speed:	4,000
Street:	US5	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Turnout	Bike Racks:	No		

Pleasantview Terrace

Route(s):	Green			Traffic Volume:	4,000
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	0	Traffic Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Shoulder pull-off	Bike Racks:	No		

Datamann

Route(s):	Green			Traffic Volume:	4,800
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	147	Traffic Speed:	30
Street:	US5	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	Yes	Crosswalks:	No		
Bus Stop:	Turnout	Bike Racks:	No		

Ravenwood Terrace

Route(s):	Green			Traffic Volume:	4,100
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	125	Traffic Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Chandler Road

Route(s):	Green			Traffic Volume:	6,500
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	85	Traffic Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Cumberland Farms, Opposite

Route(s):	Green			Traffic Volume:	6,500
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	64	Traffic Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Park + Ride, Tafts Flats

Route(s):	Green			Traffic Volume:	6,500
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	67	Traffic Speed:	30
Street:	US5	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	Yes	Crosswalks:	Yes		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	Yes		

Saunders Avenue

Route(s):	Green			Traffic Volume:	6,500
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	568	Traffic Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	Yes	Crosswalks:	No	Although there is a shelter and sidewalk, the grass buffer prevents wheelchair accessibility to the bus.	
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Cota + Cota

Route(s):	Green			Traffic Volume:	6,500
		Buses per Day:	26		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	31	Speed:	30
Street:	US5	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No	Unsafe to stop, especially in winter, should remove stop permanently	
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

DHL

Route(s):	Green			Traffic Volume:	4,400
		Buses per Day:	26		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	55	Speed:	35
Street:	US5	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Cascadnac

Route(s):	Green			Traffic Volume:	4,400
		Buses per Day:	26		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	32	Speed:	35
Street:	VT14	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	Yes		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Shady Lawn

Route(s):	Green			Traffic Volume:	4,400
		Buses per Day:	26		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	213	Speed:	35
Street:	VT14	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Post Office, Opposite

Route(s):	Green			Traffic Volume:	4,400
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	41	Traffic Speed:	35
Street:	VT14	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

VA Cutoff Bridge

Route(s):	Green			Traffic Volume:	4,400
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	455	Traffic Speed:	30
Street:	VT14	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No	Needs ADA and winter maintenance	

Post Office

Route(s):	Green			Traffic Volume:	4,400
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	91	Traffic Speed:	35
Street:	VT14	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No	Stop sign disappears in winter in snow pile	

Shady Lawn, Opposite

Route(s):	Green			Traffic Volume:	4,400
		Buses per Day:	26		
Headway:	30 minutes	Avg. Monthly Boardings:	68	Traffic Speed:	35
Street:	VT14	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Cascadnac, Opposite

Route(s):	Green			Traffic Volume:	4,400
		Buses per Day:	26		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	12	Speed:	35
Street:	VT14	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Hartford Town Hall

Route(s):	Green/Orange			Traffic Volume:	10,500
		Buses per Day:	36		
Headway:		Avg. Monthly		Traffic	
	30 minutes	Boardings:	141	Speed:	25
Street:	VT14	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No	Need shelter	

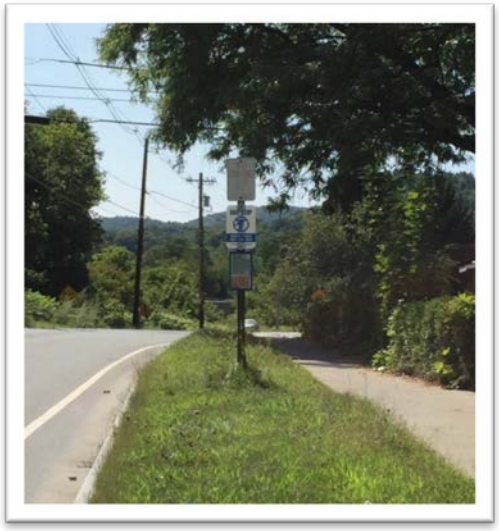
ORANGE ROUTE BUS STOPS

Kibby Equipment

Route(s):	Green/Orange			Traffic Volume:	10,500
		Buses per Day:	36		
Headway:	30 minutes	Avg. Monthly Boardings:	341	Traffic Speed:	25
Street:	VT14	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

American Legion

Route(s):	Orange			Traffic Volume:	1,800
		Buses per Day:	12		
Headway:	60 minutes	Avg. Monthly Boardings:	470	Traffic Speed:	25
Street:	South Main Street	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	Yes	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

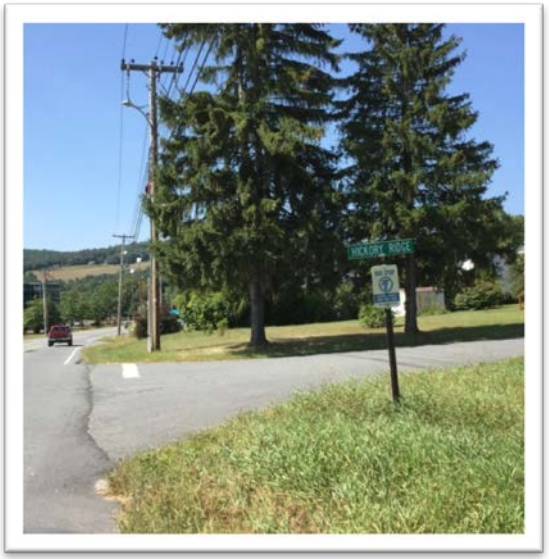


S Main + Sykes Mtn Ave

Route(s):	Orange			Traffic Volume:	1,800
		Buses per Day:	12		
Headway:	60 minutes	Avg. Monthly Boardings:	310	Traffic Speed:	25
Street:	South Main Street	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

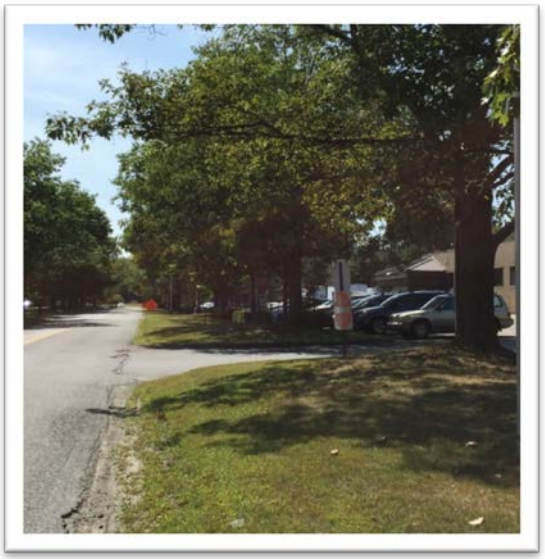
Trailer Park + Sykes Mtn Ave

Route(s):	Orange			Traffic Volume:	5,400
		Buses per Day:	12		
Headway:	60 minutes	Avg. Monthly Boardings:	112	Traffic Speed:	30
Street:	Sykes Mtn Ave	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		



Hickory Ridge

Route(s):	Orange			Traffic Volume:	5,400
		Buses per Day:	12		
Headway:	60 minutes	Avg. Monthly Boardings:	45	Traffic Speed:	30
Street:	Sykes Mtn Ave	Accessibility:	No	Amenities:	
Sign:	Yes	Sidewalks:	No	Notes:	Needs shelter
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

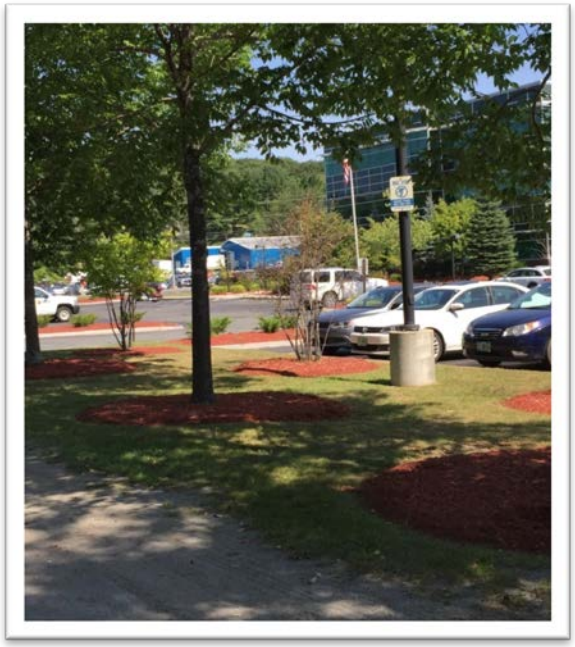


Post Office, Drop off only

Route(s):	Orange			Traffic Volume:	5,400
		Buses per Day:	12		
Headway:	60 minutes	Avg. Monthly Boardings:	0	Traffic Speed:	30
Street:	Holiday Dr	Accessibility:	No	Amenities:	
Sign:	No	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Gilman Center

Route(s):	Orange			Traffic Volume:	N/A
		Buses per Day:	12		
Headway:		Avg. Monthly		Traffic	
	60 minutes	Boardings:	150	Speed:	10
Street:	Holiday Dr	Accessibility:	Yes	Amenities:	
Sign:	No	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		



Mascoma Savings Bank

Route(s):	Orange			Traffic Volume:	5,400
		Buses per Day:	12		
Headway:		Avg. Monthly		Traffic	
	60 minutes	Boardings:	7	Speed:	30
Street:	Holiday Dr	Accessibility:	No	Amenities:	
Sign:	No	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Greyhound

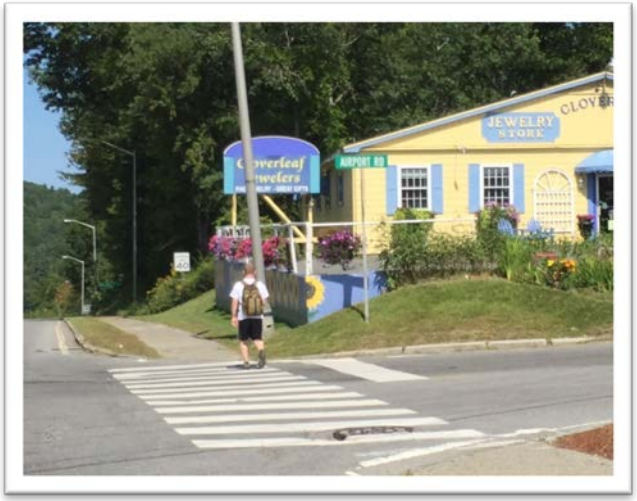
Route(s):	Orange			Traffic Volume:	10,000
		Buses per Day:	12		
Headway:	60 minutes	Avg. Monthly Boardings:	172	Traffic Speed:	30
Street:	Sykes Mtn Ave	Accessibility:	Yes	Amenities:	
Sign:	No	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

VA Hospital Outpatient Entrance

Route(s):	Orange			Traffic Volume:	7,500
		Buses per Day:	12		
Headway:	60 minutes	Avg. Monthly Boardings:	334	Traffic Speed:	15
Street:	VA	Accessibility:	Yes	Amenities:	
Sign:	No	Sidewalks:	No	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Parking lot	Bike Racks:	No		

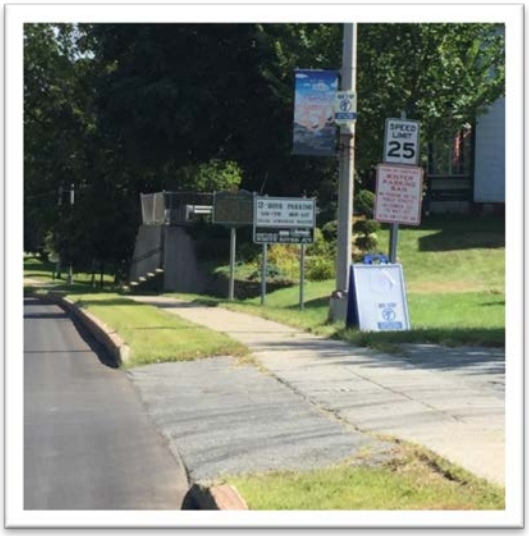
Lukoil

Route(s):	Orange	Buses per Day:	12	Traffic Volume:	7,500
Headway:	60 minutes	Avg. Monthly Boardings:	243	Traffic Speed:	40
Street:	US5	Accessibility:	Yes	Amenities:	
Sign:	No	Sidewalks:	No	Notes:	Needs shelter
Shelter:	No	Crosswalks:	No		
Bus Stop:	Parking lot	Bike Racks:	No		



Cloverleaf, Drop off only

Route(s):	Orange	Buses per Day:	12	Traffic Volume:	
Headway:	60 minutes	Avg. Monthly Boardings:	0	Traffic Speed:	40
Street:	US5	Accessibility:	No	Amenities:	
Sign:	No	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		



Bugbee Senior Center

Route(s):	Orange			Traffic Volume:	3,100
		Buses per Day:	12		
Headway:	60 minutes	Avg. Monthly Boardings:	54	Traffic Speed:	25
Street:	N Main St	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	No		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Twin Rivers

Route(s):	Orange			Traffic Volume:	3,100
		Buses per Day:	12		
Headway:	60 minutes	Avg. Monthly Boardings:	39	Traffic Speed:	25
Street:	N Main St	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	
Shelter:	No	Crosswalks:	Yes		
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Bridge Street

Route(s):	Orange			Traffic Volume:	3,800
		Buses per Day:	12		
Headway:		Avg. Monthly		Traffic	
	60 minutes	Boardings:	136	Speed:	25
Street:	Bridge Street	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	Needs
Shelter:	No	Crosswalks:	Yes		shelter
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		

Hartford Town Hall

Route(s):	Orange			Traffic Volume:	10,500
		Buses per Day:	36		
Headway:		Avg. Monthly		Traffic	
	60 minutes	Boardings:	141	Speed:	25
Street:	VT14	Accessibility:	Yes	Amenities:	
Sign:	Yes	Sidewalks:	Yes	Notes:	Needs
Shelter:	No	Crosswalks:	No		shelter
Bus Stop:	Curbside: Travel Lane	Bike Racks:	No		