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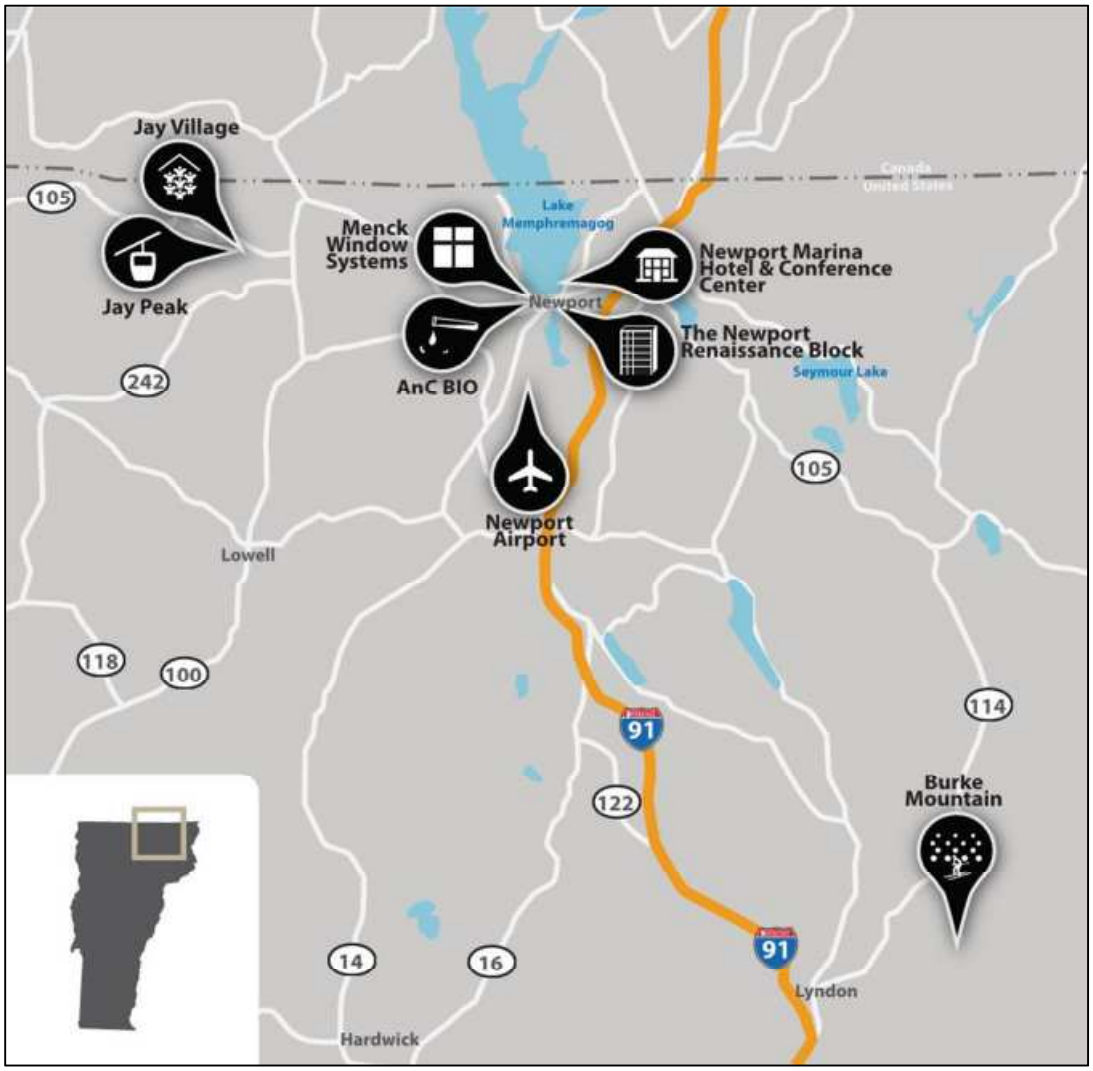
Appendices

Appendix A: Local Concerns Meeting Materials

1 INTRODUCTION

The Northeast Kingdom has received significant attention recently with discussions of increased efforts to strengthen the overall vibrancy and vitality of the region. This is an opportune time to evaluate the implications of projected EB-5 growth in the Jay, Newport/Derby, and Burke/Lyndon areas to ensure that the transportation system can continue to support this and future growth sustainably and in a manner consistent with the region's vision for the future. This effort is focused on accommodating the initial wave of 1,500 – 2,000 jobs expected to be generated directly by the nine EB-5 Immigrant Investor -related economic development projects identified in Figure 1-1 below.

Figure 1-1: Northeast Kingdom Study Area Context



The eight EB-5 economic development projects that form the basis of this study include:

- **Jay Peak (2 projects)** – a total of $170 million in investment in new facilities, anticipated to be built in 2013 and 2014
- **Jay Village** – $120 million investment in a new 150-suite hotel offering recreation and entertainment facilities, anticipated to be operational in 2015
- **Newport Manufacturing (2 projects)** – approximately 165,000 square feet of new manufacturing and distribution facilities generating 2,000 direct and indirect jobs, anticipated to be operational in 2013 and 2014
- **Newport Marina Hotel and Conference Center** – a new 150-unit hotel anticipated to be constructed in 2014
- **The Newport Renaissance Block** – a new 6-level mixed-use building in downtown Newport anticipated to be constructed in 2014
- **Burke Mountain** - $108 million in investment in new hotel facilities generating over 2,000 direct, indirect and induced jobs, anticipated to be constructed between 2013 and 2015.

The growth projected to be associated with the EB-5 projects is sure to have a positive impact on the region's economy. However, this growth (both primary and induced) will place a strain on the current transportation infrastructure. This is the perfect opportunity to step back and evaluate the future scenario from a truly regional perspective to ensure that transportation improvements occur in an orderly and planned fashion and are consistent with a vision for the region articulated by residents and business owners from across the Northeast Kingdom. While a key component of this study is the review and update of recent transportation planning initiatives to ensure compatibility with EB-5 growth projections, this plan is also an opportunity to bring the region together to develop a shared vision for the future of the Northeast Kingdom and identify specific recommendations, triggers, and an implementation plan to ensure that the plan's conclusions become reality.

2 PROJECT BACKGROUND

2.1 EXISTING PLAN AND STUDY REVIEW

Seven relevant studies of note shown below in Table 2-1 have been reviewed to establish a comprehensive background for this transportation study. A brief summary of the key findings and recommendations of each of these studies is provided below.

Table 2-1: Existing Plan and Study Review

	Date	Report Title	Author	Sponsor
1	2010	Newport City Thoroughfare Plan	Smart Mobility	NVDA
2	2008	Lyndon Area Corridor Management Plan	Smart Mobility	NVDA
3	2008	Intersection Study at Main Street, Causeway & Railroad Square	Lamoureux & Dickinson	NVDA, Newport City
4	2007	Intersection Study for the US 5/VT 5A/VT 105 Intersection in the Town of Derby, Vermont	Summit Engineering	NVDA, Town of Derby
5	2007	Burke Mountain Area Transportation Infrastructure Study	RSG, LandWorks	NVDA, Towns of Burke and Lyndon
6	2006	Jay Peak Transportation Infrastructure Study	RSG, LandWorks	NVDA, Jay Peak Resort, Towns of Jay, Troy, and Westfield
7	2006	US 5 Corridor Study	RSG	NVDA, Newport City, Town of Derby, Village of Derby Center

Newport City Thoroughfare Plan *(Smart Mobility, 2010)*

- E Main Street (US 5): extend sidewalk to Causeway/Union Intersection; narrow cross section, improve crosswalks with bulb-outs, reduce access points, replace outdated traffic signal. *Some progress*
- Bicycle Network: plan, sign and mark bicycle routes to nearby destinations. *Not implemented*
- Main Street (US 5): replace signal at Coventry to coordinate with new signal, reconfigure Coventry intersection for wider sidewalks and narrower lanes. *Not implemented*
- Coventry Street: resurface, provide pedestrian improvements, reconfigure with on-street parking. *Paving completed in 2011*
- Causeway: establish Parkway Streetscape with greenbelt along sidewalk, landscaped median, and tree arcade. *Not implemented*

Lyndon Area Corridor Management Plan *(Smart Mobility, 2008)*

- Broad Street Project: scale-back continuous third lane, add greenbelt between roadway and sidewalk, extend project limit north to include safety and capacity concerns at Hill Street/South Street Intersection, implement innovative storm water treatment. *Some progress*
- Charles Street: restore two-way operations. *Not implemented*
- VT 114: consider bicycle transportation in corridor; access management. *Not implemented*
- VT 122: consider truck route designation and associated improvements. *Not implemented*
- Lyndonville: expand downtown parking; Depot Street streetscape improvements. *Not implemented*

Intersection Study at Main Street, Causeway & Railroad Square *(Lamoureux & Dickinson, 2008)*

- Three alternatives: signalization, roundabout, or one-way traffic circulation; one-way circulation preferred. *Not implemented*

Intersection Study for the US 5/VT 5A/VT 105 Intersection in the Town of Derby, Vermont *(Summit Engineering, 2007)*

- Intersection signalization with pedestrian accommodations (alternative 3). *Not implemented*

Burke Mountain Area Transportation Infrastructure Study *(RSG and LandWorks, 2007)*

- US 5 (Broad Street): widen to a 3-lane section with center two-way left-turn lane, landscaping, and consolidated curb cuts. *Not implemented*
- US 5/VT 114 Intersection: remove northbound slip lane and re-time traffic signal; evaluate roundabout. *Not implemented*
- US 5/Back Center Road: re-time traffic signal. *Not implemented*
- East Burke: streetscape, bike/ped/gateway, intersection and access management enhancements. *Bike and Ped grant awarded for final engineering and construction*
- Lyndonville: convert two-way roads into a one-way circulation scheme. *Not implemented*
- Regional: new shuttle bus between Burke Mountain Resort, East Burke and Lyndon. *Not implemented*
- VT 122: pavement reconstruction from Matthewson Hill Road to Pudding Hill Road. *Paving overlay to exit 24 completed*
- VT 114: pavement reconstruction from US 5 to Quarry Road (Newark). *Not implemented*
- Burke: bridge replacement BR 15 and BR 17 over Dish Mill Brook. *Completed*

Jay Peak Transportation Infrastructure Study (*RSG and LandWorks, 2006)*

- VT 242: shoulder expansion from Jay village to Jay Peak Resort; pavement reconstruction. *Paving project schedule for Summer 2014*
- VT 105: pavement reconstruction from VT 101 to North Troy. *Completed*
- VT 242/VT 101 Intersection: add northbound left and eastbound right turn lanes. *Not implemented*
- Regional: village enhancements (i.e., sidewalks, drainage, streetscaping, traffic calming) in Jay, North Troy, Troy and Westfield; implement land use recommendations. *Westfield feasibility study completed in 2012*
- VT 242: install new safety signage – *Not implemented*
- Jay Peak: install four new directional signs and relocate two Official Business Directional Signs – *Not implemented*

US 5 Corridor Study *(RSG, 2006)*

- New Sidewalks on US 5 between Quarry Road & Shaws Plaza and between West Street and VT 105. *Not implemented*
- Spot-Speed Study in Derby Center Village. *Not implemented*

- Transit shelters/signage on US 5. *Completed*
- Intersection improvements on US 5 at Western Avenue, Community Drive, Shattuck Hill Road, Quarry Road, Shaws Plaza, I-91 ramps, and VT 105. *Completed*
- US 5 widening: Western Avenue to Industrial Drive, Industrial Drive to I-91, I-91 to VT 105. *Not implemented*
- Construct new local roads between Shattuck Hill Road and US 5. *Not implemented*
- Construct new connectors between Shaws Plaza and Quarry Road, and between US 5 and West Street. *Commons Road constructed between Shaws Plaza and Quarry Road*

2.2 PROJECT KICK-OFF MEETING

In addition to the information gleaned from the previous studies described in Section 2.1 of this report, local and regional stakeholders provided valuable input during the project kick-off meeting, held on June 12, 2013. Local insights relevant to this study are shown graphically in Figure 2-1, Figure 2-2, and Figure 2-3 for the three study areas.

Figure 2-1: Kick-off Meeting Comments – Newport/Derby Study Area

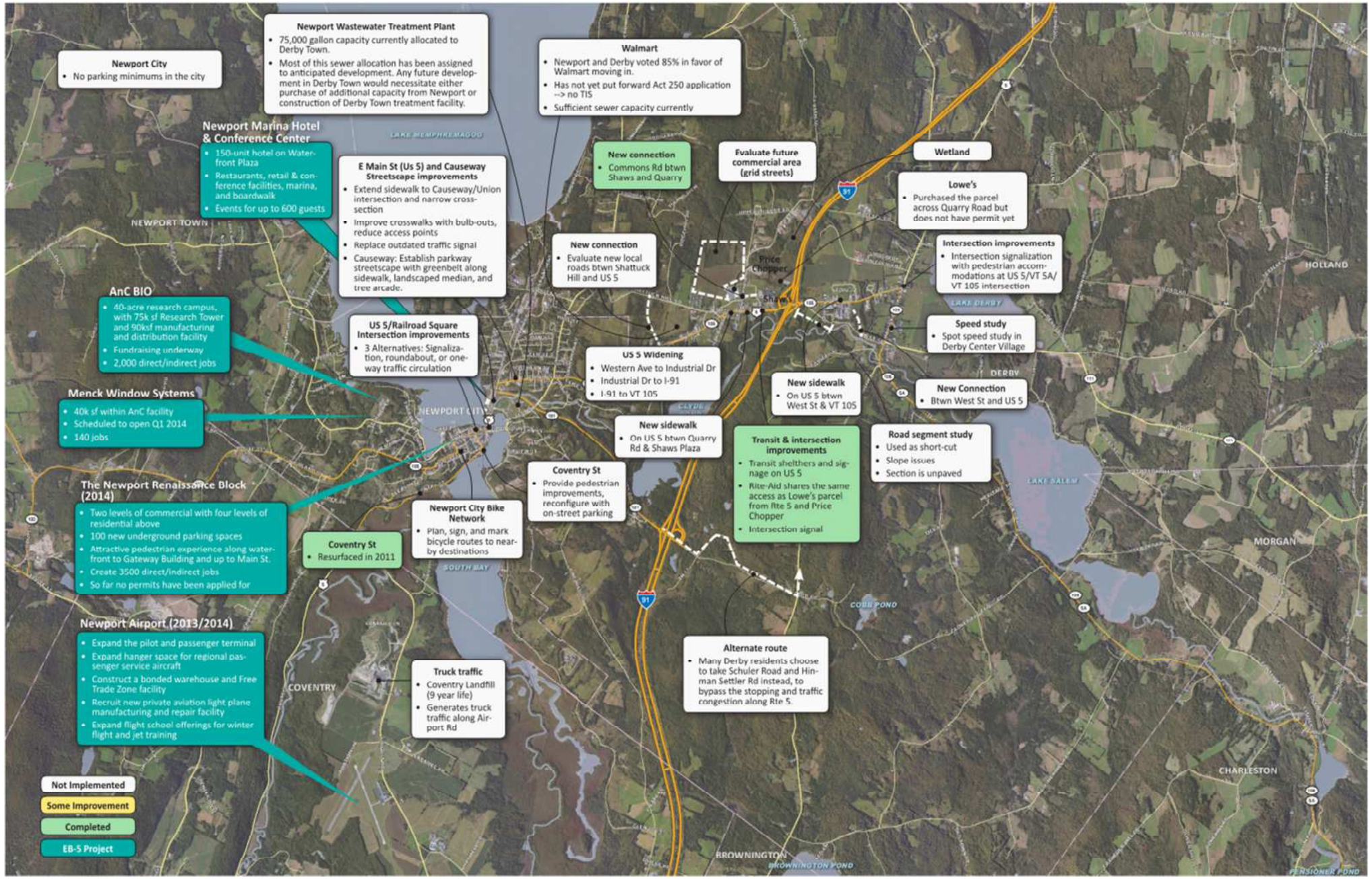


Figure 2-2: Kick-off Meeting Comments – Burke/Lyndon Study Area

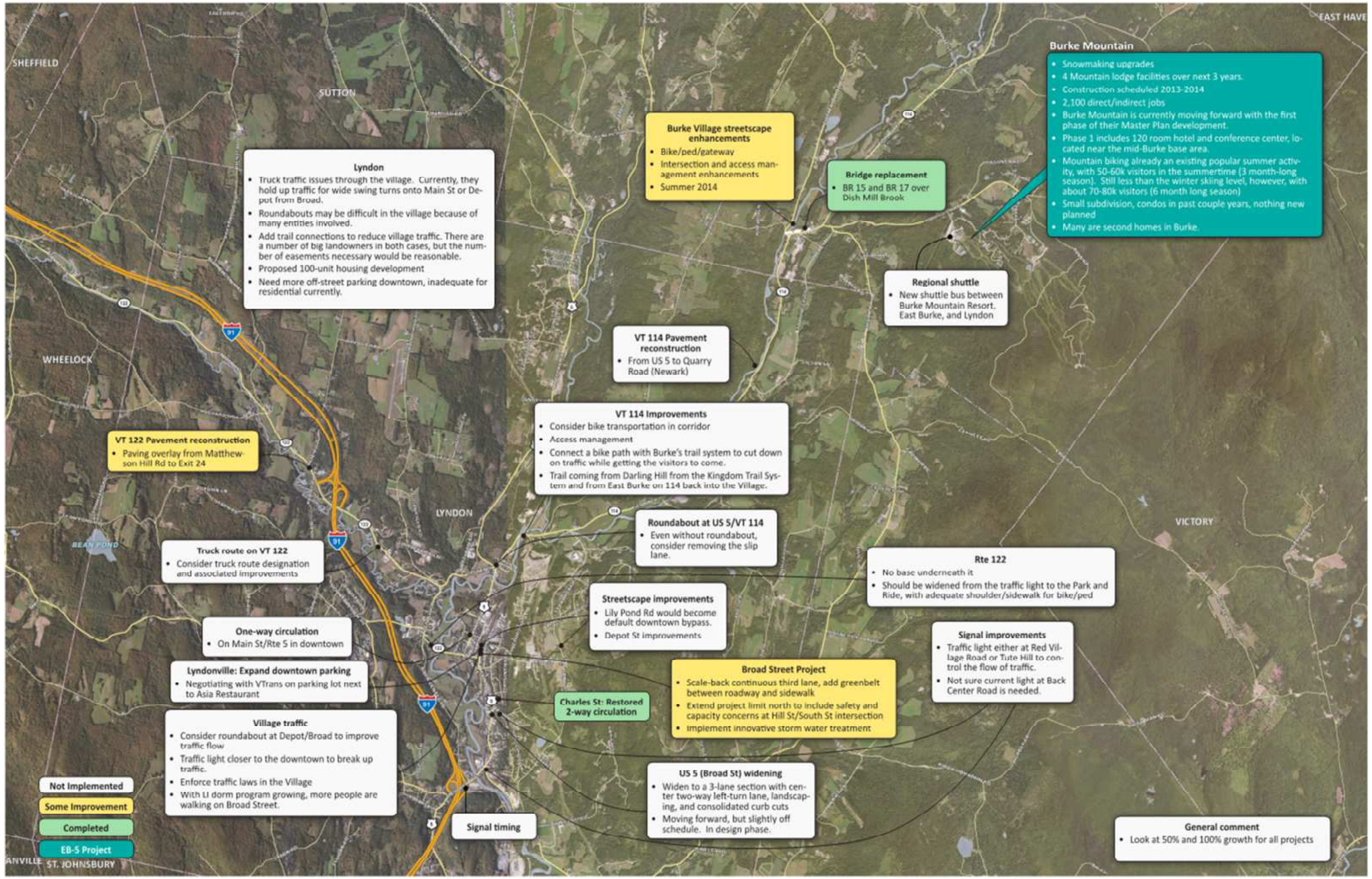
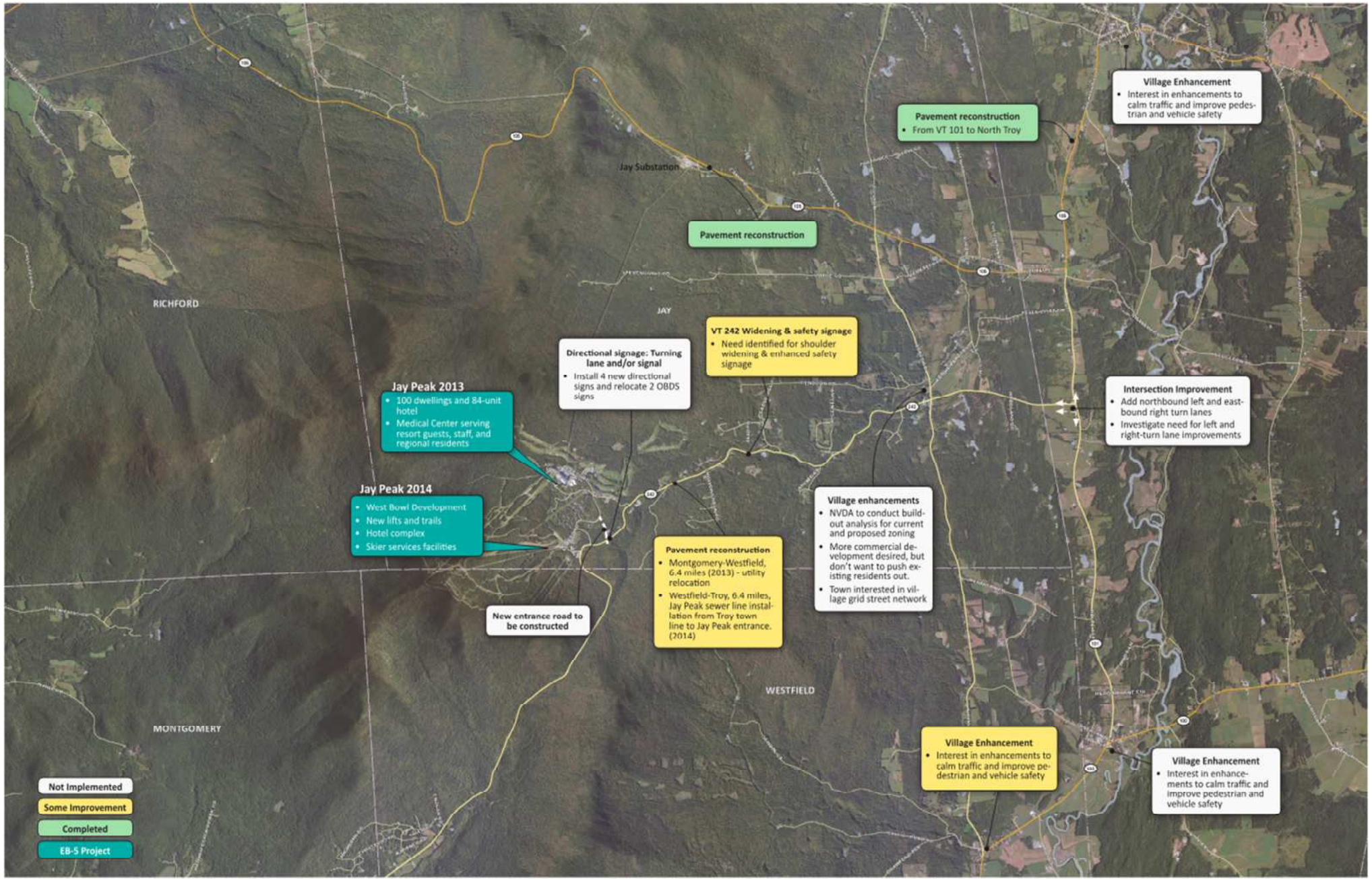


Figure 2-3: Kick-off Meeting Comments – Jay Study Area



3 EXISTING CONDITIONS

3.1 PROJECT STUDY AREA

The Northeast Kingdom Transportation Infrastructure Plan is split into three study areas, due to the large geographic area covered by the study. The three study areas are the Newport/Derby Study Area, the Burke/Lyndon Study Area, and the Jay Study Area.

Newport/Derby Study Area

The Newport/Derby Study Area is shown below in Figure 3-1 and Figure 3-2. It is located in the area bounded by the Town of Newport to the west, Lake Memphremagog to the north, the towns of Morgan and Holland to the east, and the towns of Coventry and Brownington to the south. There are a total of 16 intersections within the Newport/Derby Study Area identified for evaluation in this study:

Newport Intersections

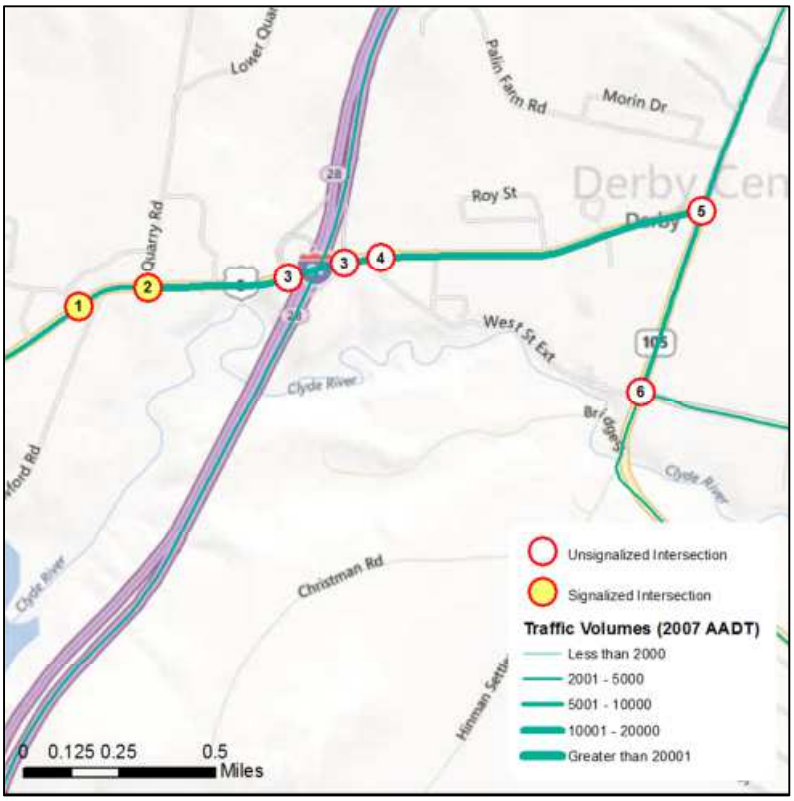
1. Main Street/Lake Road
2. Main Street (US 5/VT 105)/School Street/Third Street
3. Main Street (US 5/VT 105)/Coventry Street/Seymour Lane
4. Main Street (US 5/VT 105)/Causeway/Railroad Square
5. E Main Street (US 5/VT 105)/VT 191
6. E Main Street (US 5/VT 105)/Union Street
7. Coventry Street (US 5)/Airport Road
8. Highland Avenue (VT 105)/Logan Drive
9. Highland Avenue (VT 105)/Alderbrook Road
10. Highland Avenue (VT 105)/Pleasant Street (US 5)

Derby Intersections

1. US 5/Shattuck Hill Road/Crawford Road
2. US 5/Quarry Road
3. US 5/I-91 Northbound & Southbound Ramps
4. US 5/West Street
5. Main Street (US 5/VT 5A/VT 105)/Derby Line Road
6. Main Street (VT 5A/VT 105)/VT 111

Figure 3-1: Newport Study Intersections and Traffic Control

Figure 3-2: Derby Study Intersections and Traffic Control



Burke/Lyndon Study Area

The Burke/Lyndon Study Area is shown below in Figure 3-3 and Figure 3-4. It is located in the area bounded by I-91 to the west, the towns of Newark and East Haven to the north, Burke Mountain to the east, and the Town of St. Johnsbury to the south. There are a total of seven intersections within the Burke/Lyndon Study Area identified for evaluation in this study:

Burke Intersections

1. VT 114/Mountain Road
2. VT 114/East Darling Hill Road

Lyndon Intersections

1. US 5/VT 114/VT 122
2. Main Street (US 5)/Depot Street
3. Depot Street (US 5)/Broad Street
4. US 5/Red Village Road
5. US 5/Back Center Road/Calkins Drive

Figure 3-3: Burke Study Intersections and Traffic Control

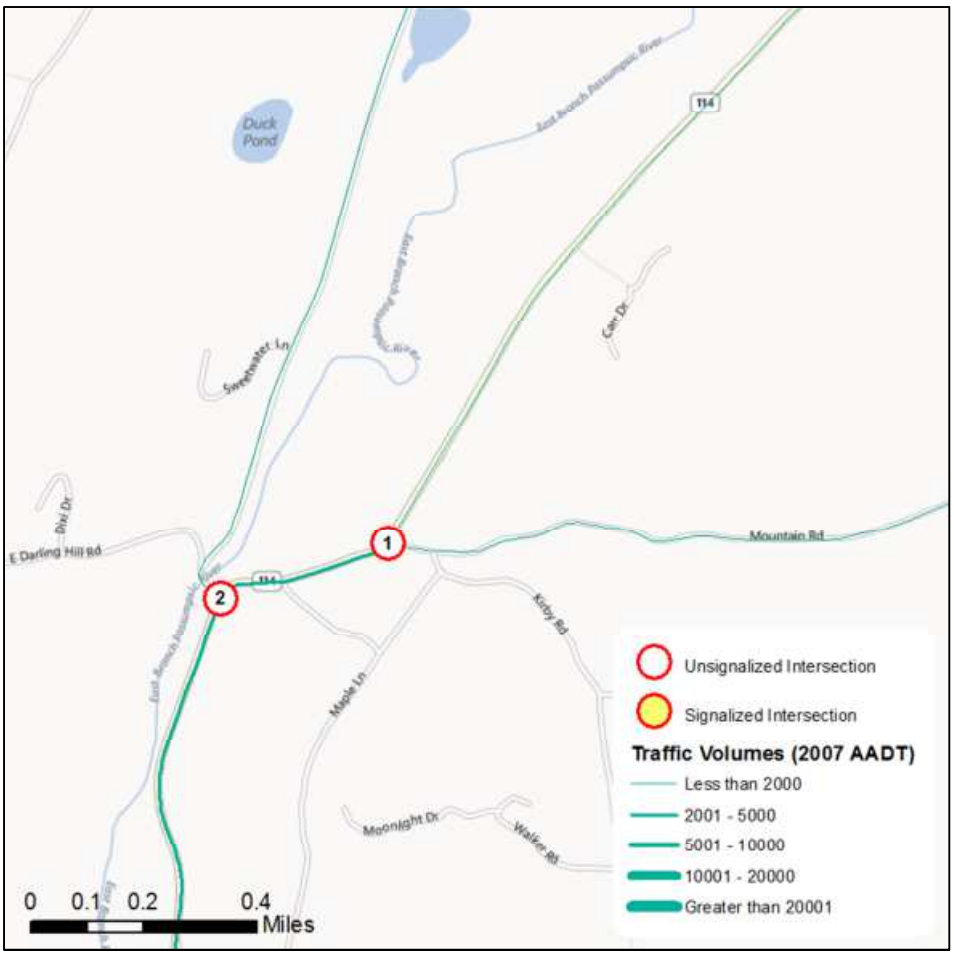
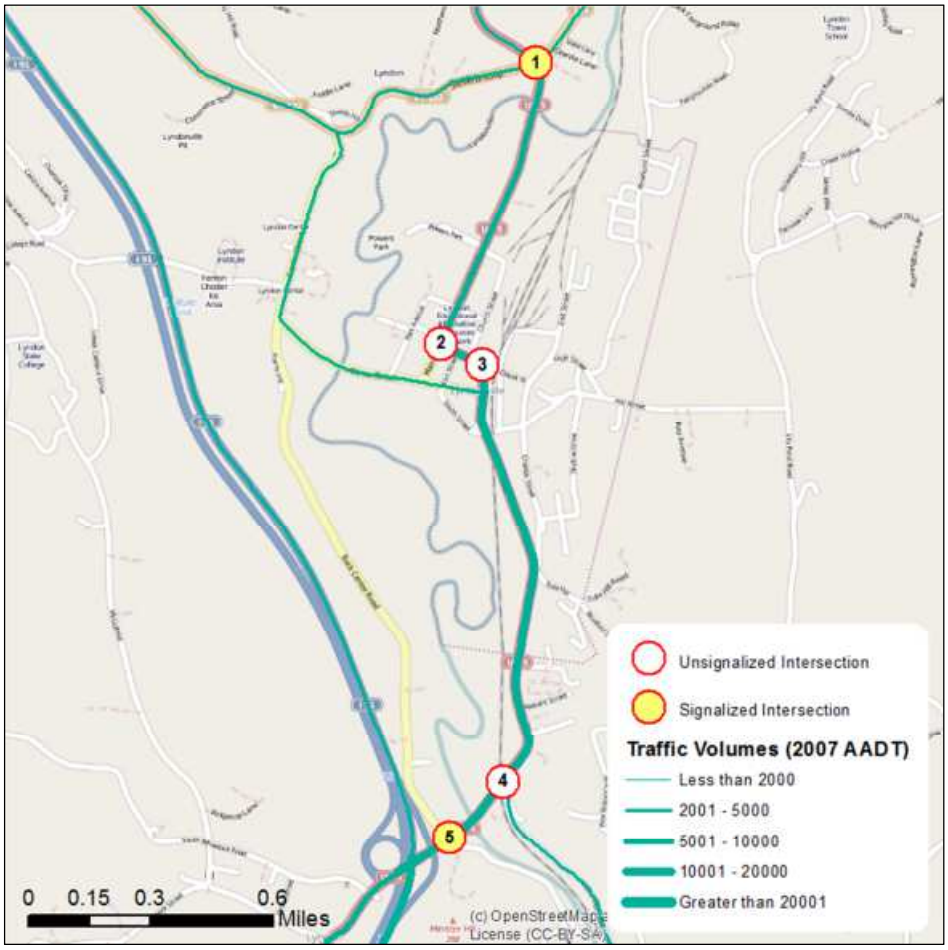


Figure 3-4: Lyndon Study Intersections and Traffic Control

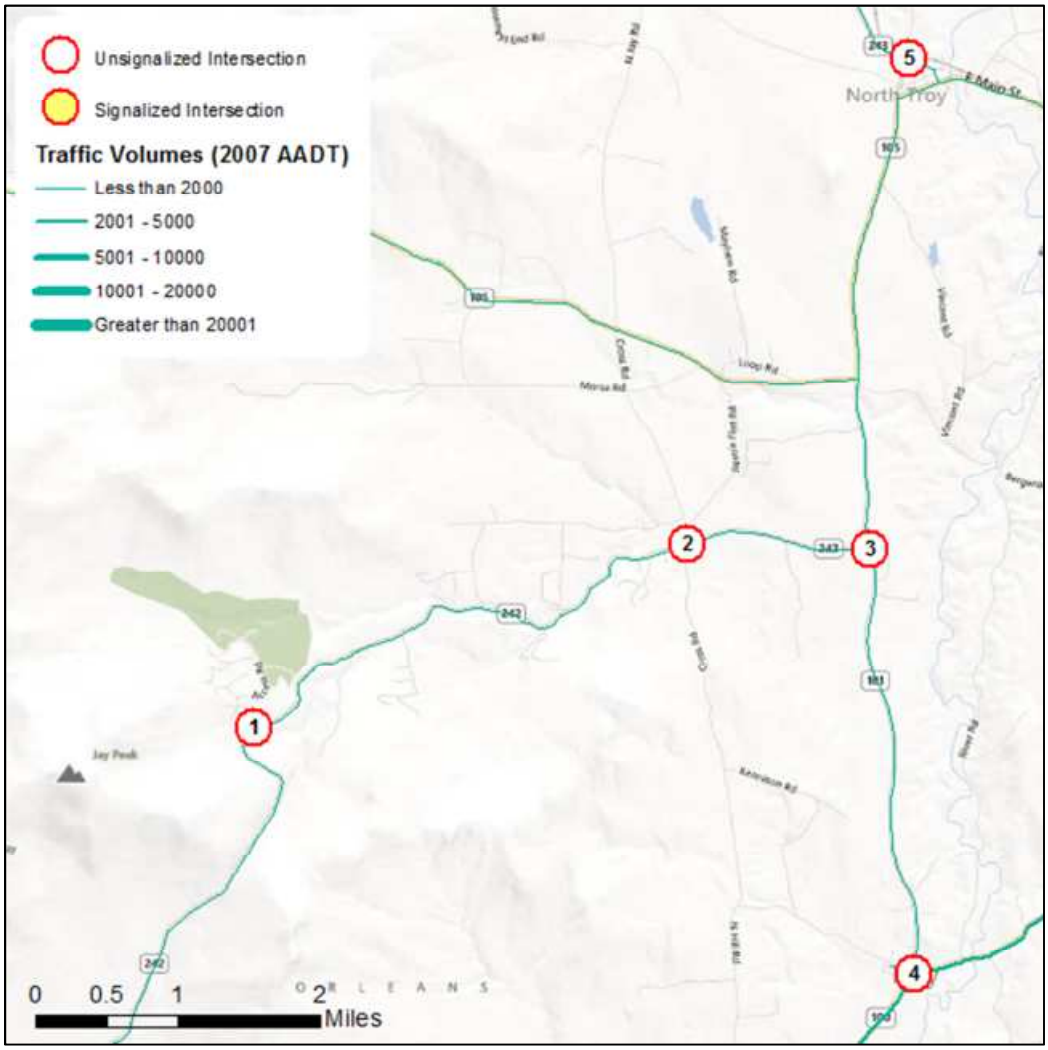


Jay Study Area

The Jay Study Area is shown below in Figure 3-5. It is located in the area bounded by Jay Peak to the west, the Canadian border to the north, the Town of Newport to the east, and the Town of Westfield to the south. There are a total of five intersections within the Jay Study Area identified for evaluation in this study:

1. VT 242/Jay Peak Access Road
2. VT 242/Cross Road
3. VT 242/VT 101
4. VT 101/VT 100
5. VT 243/Elm Street/Railroad Street

Figure 3-5: Jay Study Intersections and Traffic Control



3.2 ROADWAY CHARACTERISTICS

The roadway characteristics for the major roadway corridors in the three project study areas are summarized in Table 3-1. Characteristics include the roadway's functional classification, jurisdiction, number of travel lanes, posted speed limits (mph), and approximate shoulder widths. The functional classification and jurisdiction hierarchies are described below.

Functional Classification

The Federal Highway Administration's roadway functional classification system is organized as a hierarchy of facilities, based on the degree to which the roadway serves mobility and access to adjacent land uses. Freeways and interstate highways, at the top of the hierarchy, are devoted exclusively to vehicle mobility, with no direct access to adjacent land. Arterials and Collectors provide both mobility and access to adjacent land uses. The local road system is devoted exclusively to providing local access, with limited capacity and relatively slow speeds.

As shown in Table 3-1, most of the study area roadways are classified as major collectors and serve the primary role of providing a connection between the local road network and the arterial network. Other roadways in the study area are classified as minor arterials or interstate (I-91).

Roadway Jurisdiction

Roadway jurisdictions refer to the local, state, or federal entity responsible for the operation and maintenance of a roadway facility. The different designations are provided below.

- State Route: Forms the primary transportation network through the State and is the responsibility of VTrans. State routes include all state numbered highway routes not designated as Class 1 town highways and US highways.
- Class 1 Town Highway: Forms the extension of state numbered highway routes through a town, and which carry a state highway route number. Class 1 town highways are subject to concurrent jurisdiction between the Municipality and VTrans on several matters.
- Class 2 Town Highway: Those town highways selected as the most important highways in each town. As far as practicable they shall be selected with the purposes of securing trunk lines of improved highways connecting two towns and to places which by their nature have more than a normal amount of traffic. Class 2 highways are primarily the responsibility of municipalities.
- Class 3 Town Highway: All other town highways that are "negotiable under normal conditions all seasons of the year by a standard pleasure car." Class 3 town highways, including sidewalks, crosswalks, and parking, are the responsibility of municipalities.
- Class 4 Town Highway: All other town highways are considered Class 4 town highways. The majority of these receive limited or no maintenance.

As shown in Table 3-1, most of the major study area roadways fall under the jurisdiction of the State. Those facilities located within the city/town limits of Newport and Lyndonville fall under the jurisdiction of the Town. I-91 is part of the Interstate Highway System, and therefore is under joint State and Federal jurisdiction.

Table 3-1: Characteristics of Major Study Area Roadways

Roadway	Functional Classification	Jurisdiction	Speed Limit (mph)	# of Travel Lanes (in each direction)	Shoulder Width
Newport/Derby Study Area					
I-91	Interstate	Federal	65	2	Approx. 6'
US 5	Minor Arterial; Major Collector s/o Newport City and n/o Town of Derby	State outside of Newport City; Town in Newport City	25 - 35	1-2	Approx. 0' – 3'
VT 191	Minor Arterial	State	35-50	1	Approx. 1' – 3'
VT 111	Major Collector	State	35	1	None
VT 105	Minor Arterial	State outside of Newport City; Town in Newport City	35	1	Approx. 1' – 3'
VT 5A	Minor Arterial	State	35	1	Approx. 1' – 3'
Burke/Lyndon Study Area					
US 5	Major Collector	State outside of Lyndonville; Town in Lyndonville	35	1	Approx. 1' – 5'
VT 122	Major Collector	State	35	1	Approx. 1' – 3'
VT 114	Major Collector	State	30 - 40	1	Approx. 1' – 3'
Jay Study Area					
VT 243	Major Collector	State	25-40	1	Approx. 0' – 3'
VT 242	Major Collector	State	35	1	Approx. 0' – 1'
VT 101	Major Collector	State	50	1	Approx. 1' – 3'
VT 100	Minor Arterial	State	35	1	Approx. 1' – 3'

3.3 TRAFFIC VOLUMES

Existing Traffic Volumes

The most recent Average Annual Daily Traffic (AADT) data is presented below in Table 3-2 and shows that US 5 experiences the highest traffic volumes across the three study areas. The three areas along US 5 that carry the highest traffic volumes in the study area are: west of downtown Newport, west of I-91 in Derby, and east of I-91 in Lyndon.

Table 3-2: Average Annual Daily Traffic (AADT) Volumes

Location	AADT	Count Year	Source
US 5, east of Coventry Rd (Newport)	15,800	2010	VTrans ATR
US 5, west of Quarry Rd (Derby)	12,400	2010	VTrans ATR
US 5, south of Back Center Rd (Lyndon)	12,300	2010	VTrans ATR
US 5, south of VT 191 (Newport)	9,900	2011	VTrans ATR
US 5, east of West St (Derby)	9,900	2012	VTrans ATR
US 5, west of Depot St (Lyndon)	9,500	2009	VTrans ATR
VT 105, north of VT 111 (Derby)	6,600	2012	VTrans ATR
US 105, west of US 5 (Newport)	4,900	2010	VTrans ATR
VT 114, north of Burke Hollow Rd (Burke)	3,500	2012	VTrans CTC
VT 101, south of VT 242 (Troy)	1,900	2010	VTrans ATR
VT 242, west of Cross Rd (Jay)	1,700	2012	VTrans ATR
Jay Peak Access Rd (Jay)	1,200	2010	VTrans CTC
Mountain Rd (Burke)	1,100	2012	VTrans CTC

Turning Movement Counts

The most recent weekday afternoon and winter weekend afternoon turning movement count data was compiled for the study intersections and is summarized in Table 3-3 below. Winter weekend afternoon data was used in place of midweek afternoon data near Burke Mountain Resort and Jay Peak Resort because it is during this time period when traffic volumes were highest due to ski resort traffic.

Table 3-3: Turning Movement Count Volumes (Count Year and Source)

Location	Period	Count Year	Source
Newport Intersections			
1. W Main St and Main St / Lake Rd	Midweek	2013	NVDA
2. US 5 / Main and School St	Midweek	2011	VTrans
3. US 5 / Coventry St	Midweek	2012	VTrans
4. US 5 / Causeway / Railroad Sq	Midweek	2013	NVDA
5. US 5 / VT 191	Midweek	2012	VTrans
6. US 5 / Union St	Midweek	2012	VTrans
7. US 5 / Airport Rd	Midweek	2011	VTrans
8. VT 105 / Logan Dr	Midweek	2013	NVDA
9. VT 105 / Alderbrook Rd	Midweek	2011	VTrans
10. VT 105 / US 5	Midweek	2013	VTrans
Derby Intersections			
1. US 5 / Shattuck Hill Rd and Crawford Rd	Midweek	2013	VTrans
2. US 5 / Quarry Rd	Midweek	2013	VTrans
3A & 3B. US 5 / I-91 NB & SB Ramps	Midweek	2012	VTrans
4. US 5 / West St	Midweek	2005	RSG
5. US 5 / VT 105	Midweek	2012	VTrans
6. VT 105 / VT 111	Midweek	2012	VTrans
Burke Intersections			
1. VT 114 / Mountain Rd	Weekend	2011	NVDA
2. VT 114 / Burke Hollow	Weekend	2011	NVDA
Lyndon Intersections			
1. US 5 / VT 114 and VT 122	Midweek	2012	VTrans
2. Depot St / Main St	Midweek	2013	NVDA
3. US 5 / Depot St / Broad St	Midweek	2013	NVDA
4. US 5 / Red Village Rd	Midweek	2011	VTrans
5. US 5 / Back Center Rd and Calkins Dr	Midweek	2011	VTrans
Jay Intersections			
1. VT 242 / Jay Access Road	Weekend	2011	NVDA
2. VT 242 / Cross Rd	Weekend	2011	NVDA
3. VT 101 / VT 242	Weekend	2011	NVDA
4. VT 101 / VT 100	Midweek	2010	VTrans
5. VT 243 / Elm St and Dominion Ave	Midweek	2008	VTrans

Traffic Adjustments

Following VTrans traffic study guidelines, raw peak hour traffic volumes were adjusted to represent the design hour volume (DHV)[1] in 2014 using two adjustment factors:

1. Design hour adjustment factors are based on multiple VTrans permanent count stations. The 2012 DHV at these stations were compared to the peak hour volumes on the date of the turning movement count to formulate DHV adjustments.[2]
2. An annual adjustment factor, which represents general background traffic growth, is based on historic count data at multiple VTrans permanent count stations, as presented in the 2012 VTrans *Red Book*.

3.4 2014 CONGESTION ANALYSIS

Level-of-service (LOS) is a qualitative measure describing the operating conditions as perceived by motorists driving in a traffic stream. LOS is estimated using the procedures outlined in the 2010 Highway Capacity Manual (HCM). In addition to traffic volumes, key inputs include the number of lanes at each intersection and the traffic signal timing plans. The LOS results are based on the existing lane configurations and control types (signalized or unsignalized) at each study intersection.

The 2010 HCM defines six qualitative grades to describe the LOS at an intersection. LOS is based on the average control delay per vehicle. Table 3-4 shows the various LOS grades and descriptions for unsignalized and signalized intersections.

Table 3-4: Level-of-Service Criteria for Signalized and Unsignalized Intersections

LOS	Characteristics	Unsignalized Total Delay (sec)	Signalized Total Delay (sec)
A	Little or no delay	≤ 10.0	≤ 10.0
B	Short delays	10.1-15.0	10.1-20.0
C	Average delays	15.1-25.0	20.1-35.0
D	Long delays	25.1-35.0	35.1-55.0
E	Very long delays	35.1-50.0	55.1-80.0
F	Extreme delays	> 50.0	> 80.0

The delay thresholds for LOS at signalized and unsignalized intersections differ because of the driver's expectations of the operating efficiency for the respective traffic control conditions. According to HCM procedures, an overall LOS cannot be calculated for two-way stop-controlled intersections because not all movements experience delay. In signalized and all-way stop-controlled intersections, all movements experience delay and an overall LOS can be calculated.

[1] The DHV is the 30th highest hour of traffic for the year and is used as the design standard in Vermont.

[2] Due to poor data in their vicinity, all intersections in Lyndon used a different, but still VTrans approved, adjustment factor. The design hour adjustments were based on VTrans count stations, which had recorded an Annual Average Daily Traffic (AADT). These design hour adjustment factors are based on the VTrans "k" factor and DHV equations for Urban Roads presented in the 2012 VTrans Red Book.

The VTrans policy on level of service is:

- Overall LOS C should be maintained for state-maintained highways and other streets accessing the state's facilities
- Reduced LOS may be acceptable on a case-by-case basis when considering, at minimum, current and future traffic volumes, delays, volume to capacity ratios, crash rates, and negative impacts as a result of improvement necessary to achieve LOS C.
- LOS D should be maintained for side roads with volumes exceeding 100 vehicles/hour for a single lane approach (150 vehicles/hour for a two-lane approach) at two-way stop-controlled intersections.

The HCM congestion reports from Synchro (v8), a traffic analysis software package from Trafficware, were used to assess congestion at the study intersections. In general, existing intersection geometries, traffic control, and signal timings were used for the congestion analysis.

The congestion analysis results indicate that almost all intersection approaches currently operate at LOS D or better during the peak hour. The only exceptions to this are listed below:

- The westbound and northbound approaches at the US 5/Mt Vernon Street intersection in Newport, which operate at LOS F and E respectively.
- The northbound left at the US 5/Depot Street/Broad Street intersection in Lyndon, which operates at LOS F.

Additionally, despite falling within VTrans acceptable guidelines, it is worth noting that the following approaches currently operate at LOS D:

- The southbound left approach at the US 5/I-91 Southbound Ramps intersection in Derby
- The eastbound left approach at the US 5/VT 105 intersection in Derby
- The westbound approach at the US 5/Red Village Road intersection in Lyndon

The congestion analysis results, including intersection LOS, average vehicle delay (in seconds) and the volume to capacity ratio (v/c), are presented below in Table 3-5, Table 3-6, Table 3-7, Table 3-8, and Table 3-9.

Table 3-5: Existing Level-of-Service Results (Newport Intersections)

Newport Intersections	Peak Hour 2014 No Build LOS	Delay	v/c
1. Main St / Lake Rd			
EB, Exiting W Main St	A	8	0.10
WB, Exiting Main St	B	10	0.43
SB, Exiting Lake Rd	A	9	0.16
2. US 5 / Main and School St*			
EB, along Main St	B	15	-
WB, along US 5	A	7	-
NB, along US 5	B	14	-
SB, exiting School St	B	12	-
3. US 5 / Coventry St			
Overall	C	25	0.59
EB, along US 5	C	29	-
WB, along US 5	B	20	-
NB, exiting Coventry St	C	27	-
SB, exiting Lane St	C	29	-
4. US 5 / Mt Vernon St*			
EB Left, along US 5	A	3	-
EB Through/Right, exiting US 5	A	2	-
WB, exiting Railroad Sq	F	>100	-
NB, exiting Poulin Grain Dr	F	71	-
SB, along US 5	C	16	-
5. US 5 / VT 191			
Overall	B	15	0.68
WB, exiting VT 191	C	24	-
NB, along US 5	B	16	-
SB, along US 5	A	8	-
6. US 5 / Union St			
Overall	B	11	0.46
WB, along US 5	C	23	-
NB, along US 5	A	3	-
SB, exiting Union St	A	10	-
7. US 5 / Airport Rd			
WB, Exiting Airport Rd	A	9	0.03
SB, along US 5	A	7	0.02
8. VT 105 / Logan Dr			
EB, along VT 105	A	8	0.00
SB, exiting Logan Dr	B	11	0.02
9. VT 105 / Alderbrook Rd			
WB, along VT 105	A	8	0.07
NB, exiting Alderbrook Rd	B	10	0.10
10. VT 105 / US 5			
WB, along US 5	A	8	0.03
NB, along US 5	B	10	0.06

*Denotes an intersection where SimTraffic was used to calculate delay

Table 3-6: Existing Level-of-Service Results (Derby Intersections)

Derby Intersections	Peak Hour 2014 No Build LOS	Delay	v/c
1. US 5 / Shattuck Hill Rd and Crawford Rd			
Overall	B	17	0.59
EB, exiting Shattuck Hill Rd	C	30	-
WB, exiting Crawford Rd	B	18	-
NB, along US 5	B	14	-
SB, along US 5	B	14	-
2. US 5 / Quarry Rd			
Overall	B	13	0.53
EB, exiting Quarry Rd	B	12	-
WB, exiting Parking Lot	B	11	-
NB, along US 5	B	14	-
SB, along US 5	B	12	-
3A. US 5 / I91 SB Ramps			
EB Left, exiting US 5	A	9	0.09
SB Left, exiting I91 SB	D	31	0.06
SB Right, exiting I91 SB	B	12	0.07
3B. US 5 / I91 NB Ramps			
EB Left, exiting US 5	A	9	0.04
NB Left, exiting I91 NB	C	25	0.26
NB Right, exiting I91 NB	B	14	0.11
4. US 5 and West St			
WB, US 5	A	9	0.00
NB, exiting West St	C	21	0.10
5. US 5 / VT 105			
EB Left, along US 5	D	25	0.54
EB Right, exiting US 5	B	12	0.38
NB, along VT 105	A	8	0.15
6. VT 105 / VT 111			
WB, exiting VT 111	B	12	0.24
SB, along VT 105	A	8	0.12

Table 3-7: Existing Level-of-Service Results (Burke Intersections)

Burke Intersections	Peak Hour 2014 No Build LOS	Delay	v/c
1. VT 114 / Mountain Rd			
WB, exiting Mountain Rd	B	15	0.50
SB, along VT 114	A	7	0.00
2. VT 114 / Burke Hollow			
EB, exiting Burke Hollow Rd	B	13	0.10
NB, along VT 114	A	8	0.02

Table 3-8: Existing Level-of-Service Results (Lyndon Intersections)

Lyndon Intersections	Peak Hour 2014 No Build LOS	Delay	v/c
1. US 5 / VT 114 and VT 122			
Overall	B	11	0.66
EB, exiting VT 122	A	8	-
WB, exiting VT 114	B	12	-
NB, along US 5	B	12	-
SB, along US 5	B	11	-
2. Depot St./Main St*			
EB, exiting Maple St	B	15	-
WB, along US 5	A	4	-
NB, exiting Main St	B	14	-
SB, along US 5	B	12	-
3. US 5/Depot St/Broad St			
EB Through exiting US 5	B	11	0.13
EB Right, along US 5	C	19	0.62
WB Left, exiting Depot St	B	13	0.21
WB Through, exiting Depot St	B	11	0.14
NB Left, along US 5	F	64	0.91
NB Right, exiting US 5	A	9	0.12
SB, exiting Angies Alley	B	10	0.04
4. US 5 / Red Village Rd			
WB, exiting Red Village Rd	D	30	0.50
SB Left, exiting US 5	A	10	0.09
5. US 5 / Back Center Rd and Calkins Dr			
Overall	A	6	0.56
EB, Exiting Back Center Rd	C	21	-
WB, exiting Calkins Dr	B	20	-
NB, along US 5	A	6	-
SB, along US 5	A	4	-

*Denotes an intersection where SimTraffic was used to calculate delay

Table 3-9: Existing Level-of-Service Results (Jay Intersections)

Jay Peak Area Intersections	Peak Hour 2014 No Build LOS	Delay	v/c
1. VT 242 / Jay Access Road			
EB, along VT 242	A	7	0.02
SB, exiting Jay Peak Resort	C	17	0.64
2. VT 242 / Cross Rd			
EB, along VT 242	A	7	0.01
WB, along VT 242	A	8	0.00
NB, along Cross Rd	B	12	0.06
SB, along Cross Rd	A	10	0.03
3. VT 101 / VT 242			
EB, Exiting VT 242	B	12	0.41
NB, along VT 101	A	7	0.03
4A. VT 101 / VT 101 (North)			
EB, along S Pleasant St	B	13	0.08
WB, along S Pleasant St	A	10	0.15
NB, along VT 101	A	7	0.03
SB, along VT 101	A	8	0.09
4B. VT 101 / VT 101 (South)			
EB, along VT 100	A	8	0.05
SB, exiting VT 101	A	9	0.05
4C. VT 101 / VT 101 (East)			
SB, Exiting S Pleasant St	B	12	0.23
5. VT 243 / Elm St and Dominion Ave			
EB, exiting Elm St	A	9	0.05
WB, exiting Dominion Ave	A	9	0.02
NB, along VT 243	A	7	0.01

3.5 LAND COVER

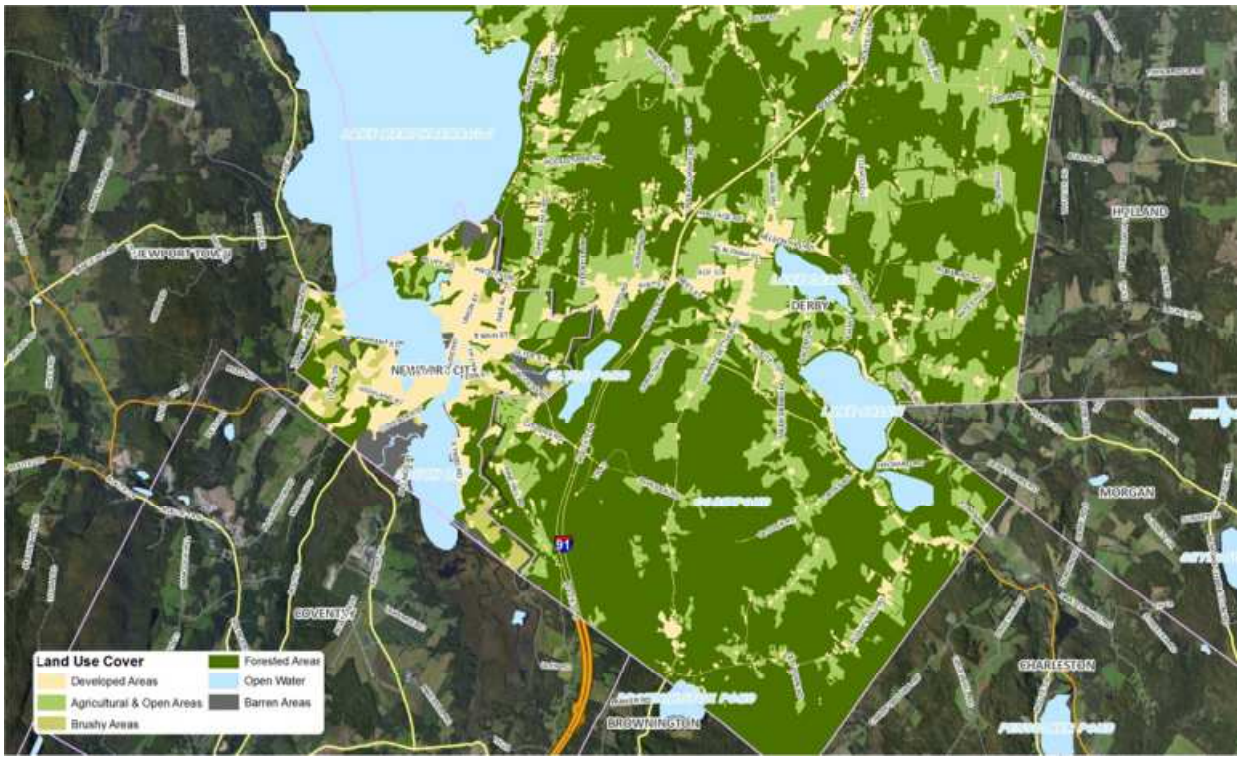
The three study areas comprise five towns (Newport City, Derby, Lyndon, Burke, and Jay) and a total land area of 110,372 acres. The majority of the study areas' land cover falls within the classification of Forested Areas (73 percent), with Agricultural & Open Space as the next largest category (17 percent). Only 7 percent is classified as Developed Area, where 30 percent or more of the area is characterized by constructed materials.[3]

Newport/Derby Study Area

Newport City is the smallest study area municipality in total land area (4,971 acres), but has the highest percentage of developed areas (28 percent) and open water (23 percent). The city has a concentrated density of commercial and office uses in its downtown, surrounded by higher density residential. (Figure 3-6) The area along the Causeway is slated for major redevelopment as part of the EB-5 projects, as well as the Renaissance Block along Main Street in the historic downtown.

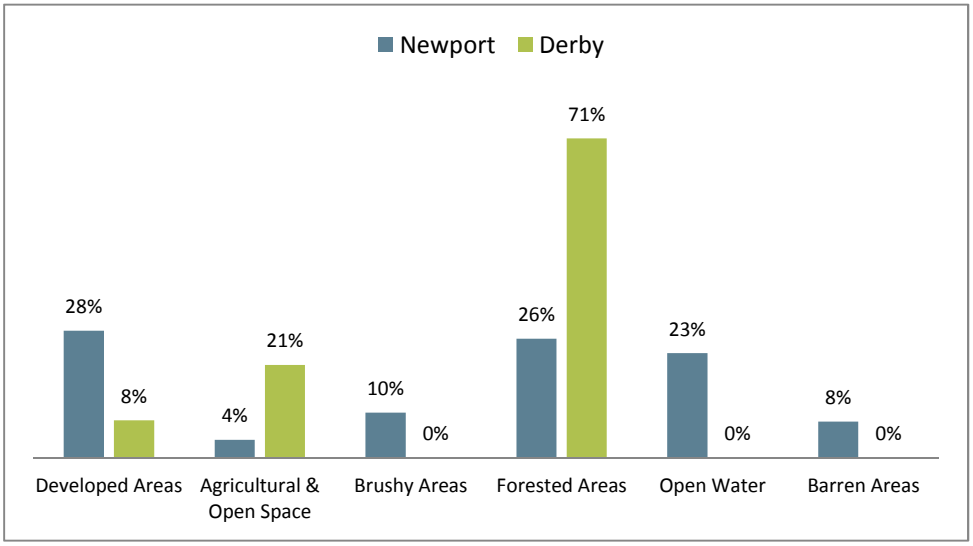
Derby is the largest study area town in terms of total land area (36,566 acres), with over two-thirds of its land cover classified as Forested Areas and only 8 percent classified as Developed Areas. Much of the commercial development is concentrated along two major arterials: east-west along E Main Street/Derby Road/US 5 and north-south along Derby Line Road/US 5. Within the town is Derby Center, a residential village that is positioned around the intersection of Main Street and VT 111, and contains a library, junior high school, and community-serving retail.

Figure 3-6: Existing Land Cover in Newport/Derby Study Area



[3] NLCD 2001 Land Cover Class Definitions. U.S. EPA.

Figure 3-7: Existing Land Cover in Newport/Derby Study Area by Percentage



Burke/Lyndon Study Area

Shown in Figure 3-8 and Figure 3-9, the Lyndon/Burke study area is also predominantly classified as Forested Areas. However, Lyndon is more developed than Burke, particularly in the Lyndonville area. The majority of central Lyndon is zoned residential, with pockets of industrial and industrial-commercial north of VT 114. A village commercial corridor runs along Main Street, Church Street, and Center Street at the core.

Burke is largely Forested Areas (81 percent) and Agricultural & Open Space (11 percent), consistent with its desire to be a tourist destination that is predominantly a rural community with a working landscape, punctuated by pockets of village centers.[4] The majority of the Developed Areas (5 percent) are homes and businesses that are concentrated in the village centers of West Burke and East Burke, and adjacent to the Burke Mountain recreation area.

[4] Burke Town Plan. Burke Planning Commission and Selectboard. July 11, 2011.

Figure 3-8: Existing Land Cover in Lyndon/Burke Study Area

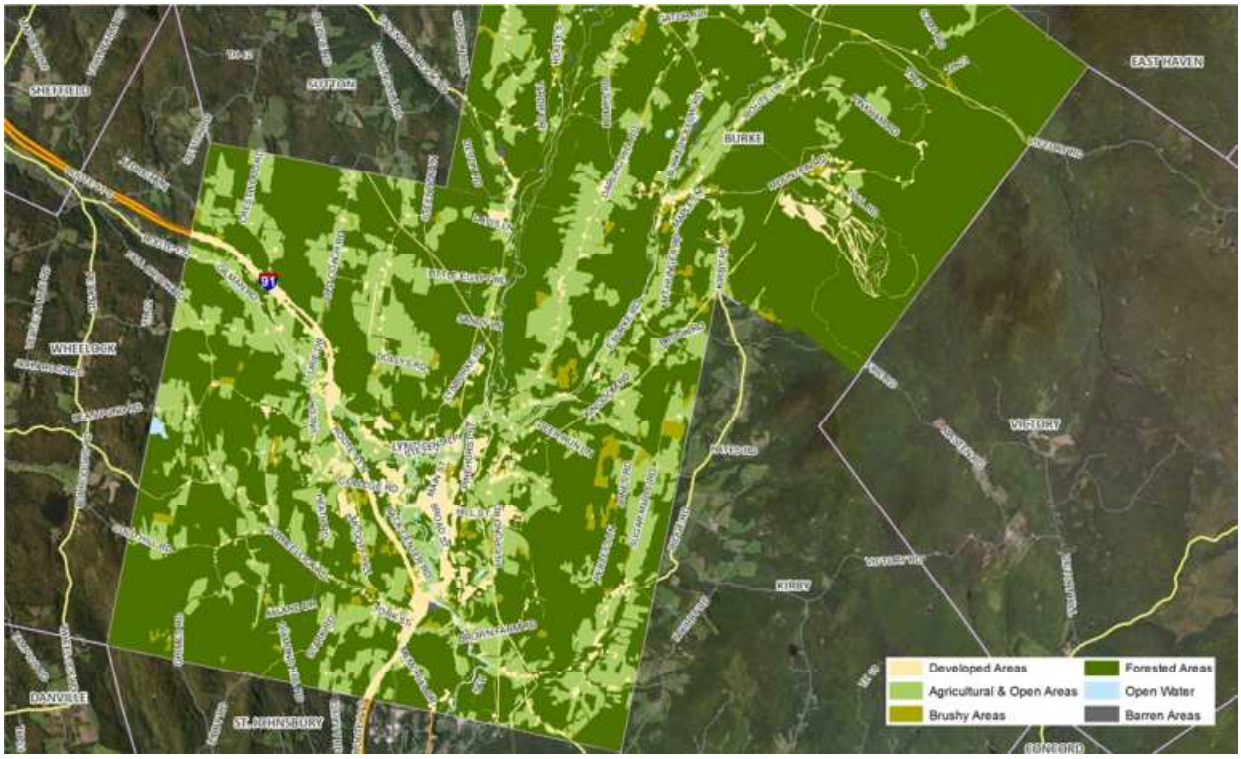
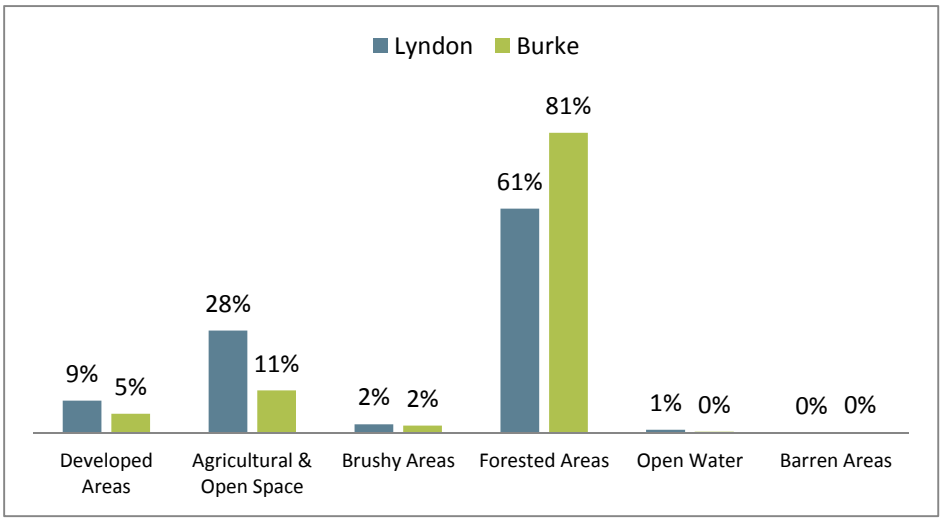


Figure 3-9: Existing Land Cover in Jay Study Area by Percentage



Jay Study Area

Jay is roughly the same land area as Burke (21,764 acres), but with half the amount of developed area (519 acres compared to 1,109 acres in Burke). The Town of Jay is the most rural in character of the towns within the study area, with 91 percent of the town classified as Forest Areas and an additional 6 percent as Agricultural & Open Space. (Figure 3-10 and Figure 3-11) The community anticipates growth, but wants to maintain a "rural recreational destination" character and ensure that new development does not worsen

traffic conditions.[5] Jay is connected to the rest of the region via two state highways: VT 105 and VT 242. The majority of the developed areas are located along VT 242, particularly at the Jay Peak resort and in the Jay Village area.

Figure 3-10: Existing Land Cover in Jay Study Area

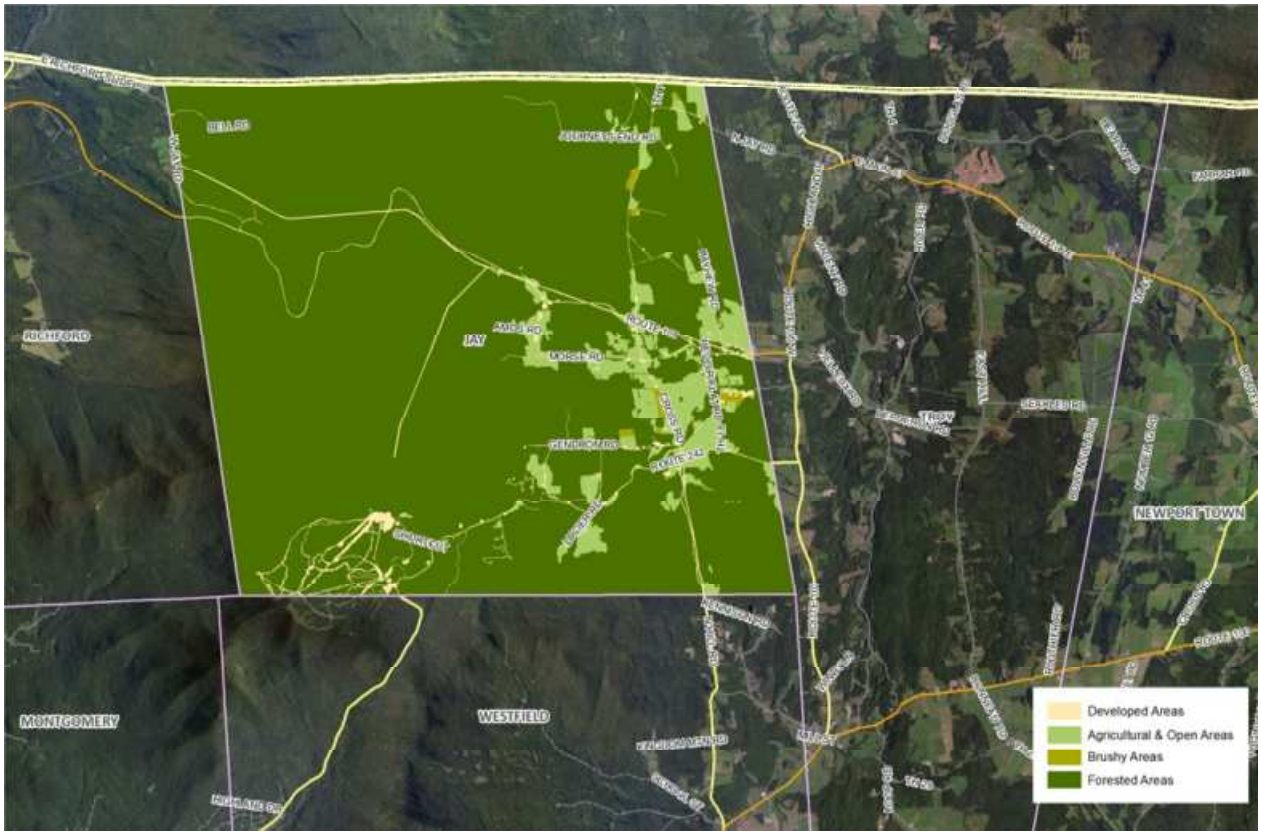
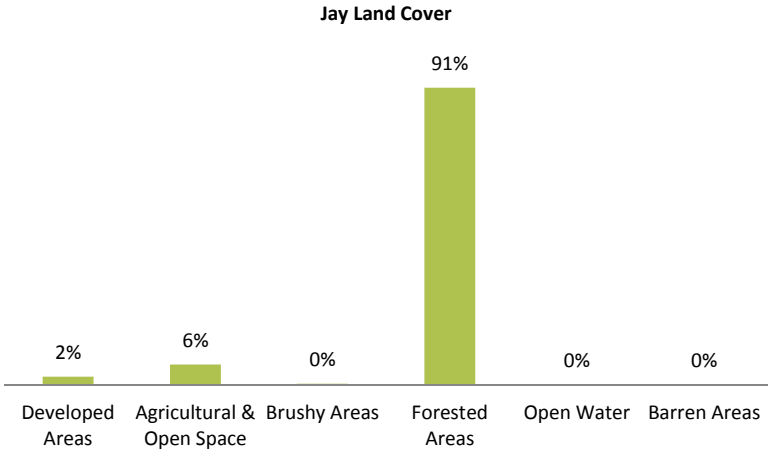


Figure 3-11: Existing Land Cover in Jay Study Area by Percentage



[5] Jay Community Development Plan. Town of Jay Selectmen. August 2010.

3.6 ALTERNATIVE TRANSPORTATION

Public Transit Service

The Northeast Kingdom's population is dispersed throughout a broad geographic area and private cars are the primary means of transportation. However, the demographics of the Northeast Kingdom indicate a high number of low income people who do not have access to cars, and a significant population of older adults and persons with disabilities. These three population groups tend to have a high need for public transportation services. This is reflected in the fact that despite being a very rural region, the Northeast Kingdom has a variety of transit services that are available to the general public as well as clients of human service agencies.

Rural Community Transportation, Inc.

Rural Community Transportation, Inc. (RCT) is a private non-profit organization that provides various modes of transportation in the Northeast Kingdom, including shuttle services for all purposes, commuter buses, shopping shuttles, and other demand response services oriented toward seniors, people with disabilities, and others who have limited access to transportation. RCT transit routes are described below and are shown graphically in Figure 3-12, Figure 3-13, and Figure 3-14.

Deviated Fixed-Route Service

RCT operates two year-round local shuttle routes with full day service. In St. Johnsbury and Lyndonville, the Jay-Lyn Shuttle operates Monday through Friday from 6:30 AM to 5:30 PM. There are five trips in each direction per day.

In Derby and Newport City, the Highlander Shuttle runs six days per week, 7:30 AM to 5:30 PM Monday through Friday, and 9AM to 1:30PM on Saturdays. The four round trips on weekdays are two to three hours apart and two round trips on Saturdays are two-and-a-half hours apart. Both the Jay-Lyn and the Highlander routes are deviated fixed routes, meaning that the vehicles are allowed to deviate off of the fixed-route up to a distance of a quarter mile along the route upon request. (Passengers may request a deviation upon boarding or call in advance to schedule a pick-up.)

Commuter Bus

RCT also operates two commuter bus services, one that runs between St. Johnsbury and Lyndonville via Route 5 (Jay-Lyn Express) and one that operates between St. Johnsbury and Montepelier (US2 Commuter). Both routes are accessible via the local shuttle services.

The Jay-Lyn Express travels between St. Johnsbury and Lyndonville and is designed to get people to and from employment along the Route 5 corridor. The bus stops at major facilities along the corridor with arrival and departure times coordinated with work start and end times. There is one trip in each direction in the morning and afternoon peak hours.

Additionally, RCT operates a commuter route in cooperation with Green Mountain Transit Agency (GMTA). The US 2 Commuter connects St. Johnsbury and Montpelier, East Montpelier, Plainfield, Marshfield, and Danville. There are four full-route round-trips, two of which are operated by GMTA (as Route 84) and two of which are operated by RCT. There is also one additional truncated round trip operated by GMTA. The service is available during the morning and afternoon peak hours Monday through Friday.

Shopping Shuttles

RCT operates five shopping shuttles in the Northeast Kingdom. These routes provide one round trip per service day, departing from residential areas in the mid-morning, and returning to the residential area by the early afternoon. Service alternates between the different communities; the Island Pond (Newport/ Island Pond) and Johnson Shopper (Hydes Park/ Johnson) operate once per week, and Ridge Runner (Craftsbury/ Hardwick/ Wolcott/ Morrisville), Kingdom Shopper (Littleton, NH/ Island Pond) and the Greenleaf (Danville/Woodville, NH) operate every other week.

Fares

All of RCT's bus services are free to riders. Because the US 2 Commuter route is jointly operated by RCT and GMTA, the routes that GMTA operates charge a fare. The one-way fare for the US 2 Commuter is $2 and there is an option to purchase monthly pass for discount. The RCT website reflects this difference.

Fleet

Rural Community Transportation has 18 active vehicles, comprising 12 vans and 6 buses. Ten vehicles (4 buses and 6 vans) are operated out of its facility in St. Johnsbury, six vehicles (2 buses and 4 vans) are operated out of Newport, and two vans are operated out of Morrisville. All vehicles are gasoline powered, except for one diesel bus garaged in St. Johnsbury. All RCT vans and buses are equipped with wheelchair lifts and mobile phones.

Passenger Information

A passenger survey issued in 2012 showed that about 70 percent of respondents were frequent riders, using the bus three to five days per week. About half of the riders are between 51 and 65, and the rest are evenly distributed among the age groups of 19-30, 31-50, and over 65.

More than half of the RCT riders have household incomes of under $20,000 annually. On the shuttle routes, these low income riders make up 96 percent of the respondents, whereas riders on the commuter routes represent a broader range of the income spectrum. The shuttle routes serve transit-dependent riders almost exclusively, while the commuter routes serve choice riders – those who choose to ride the bus rather than having no other option.

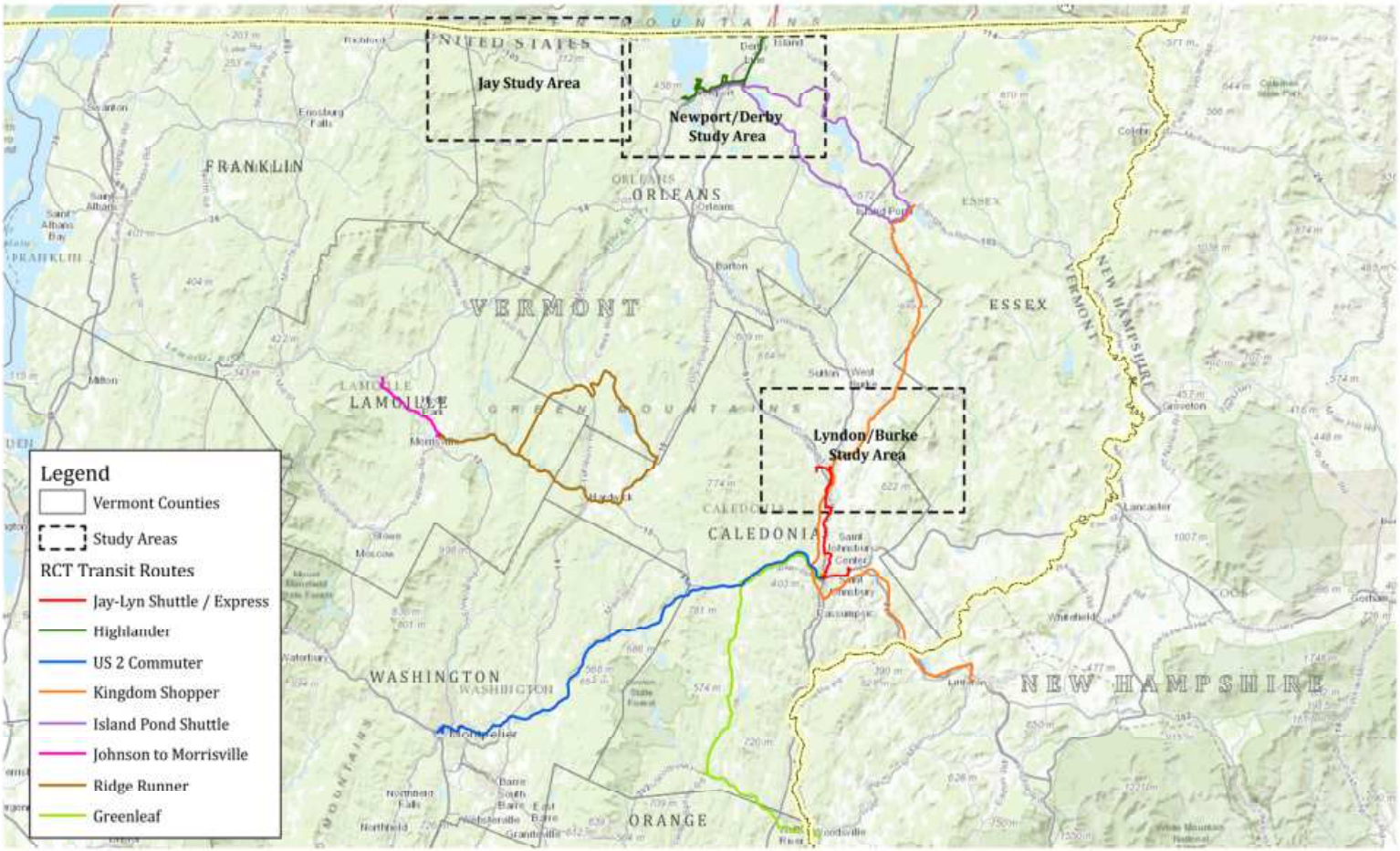
Ridership

During fiscal year 2011, RCT provided 178,688 trips on all services, including volunteer driver trips, demand response van, and fixed route service. Close to two-thirds of the total trips were provided by volunteer drivers; 27 percent were taken on the fixed route shuttle service; and 11 percent on the demand service vans. Of the fixed routes, the Jay-Lyn Shuttle is the most productive service, with 8.4 boardings per revenue hour. The Highlander had an average of 5 boardings per revenue hour, and the US 2 Commuter within the RCT jurisdiction had 3.2 boardings per revenue hour.

Agency Budget

In fiscal year 2011, RCT's total operating budget was approximately $3.8 million. More than half of the budget comes from the Medicaid program, and about a third of the funds come from a combination of Federal Transit Administration and the State of Vermont. The rest of the budget is funded by Community Organizations and Department Services, local towns, and other human service agency partners.

Figure 3-12: Existing Transit Routes Overview

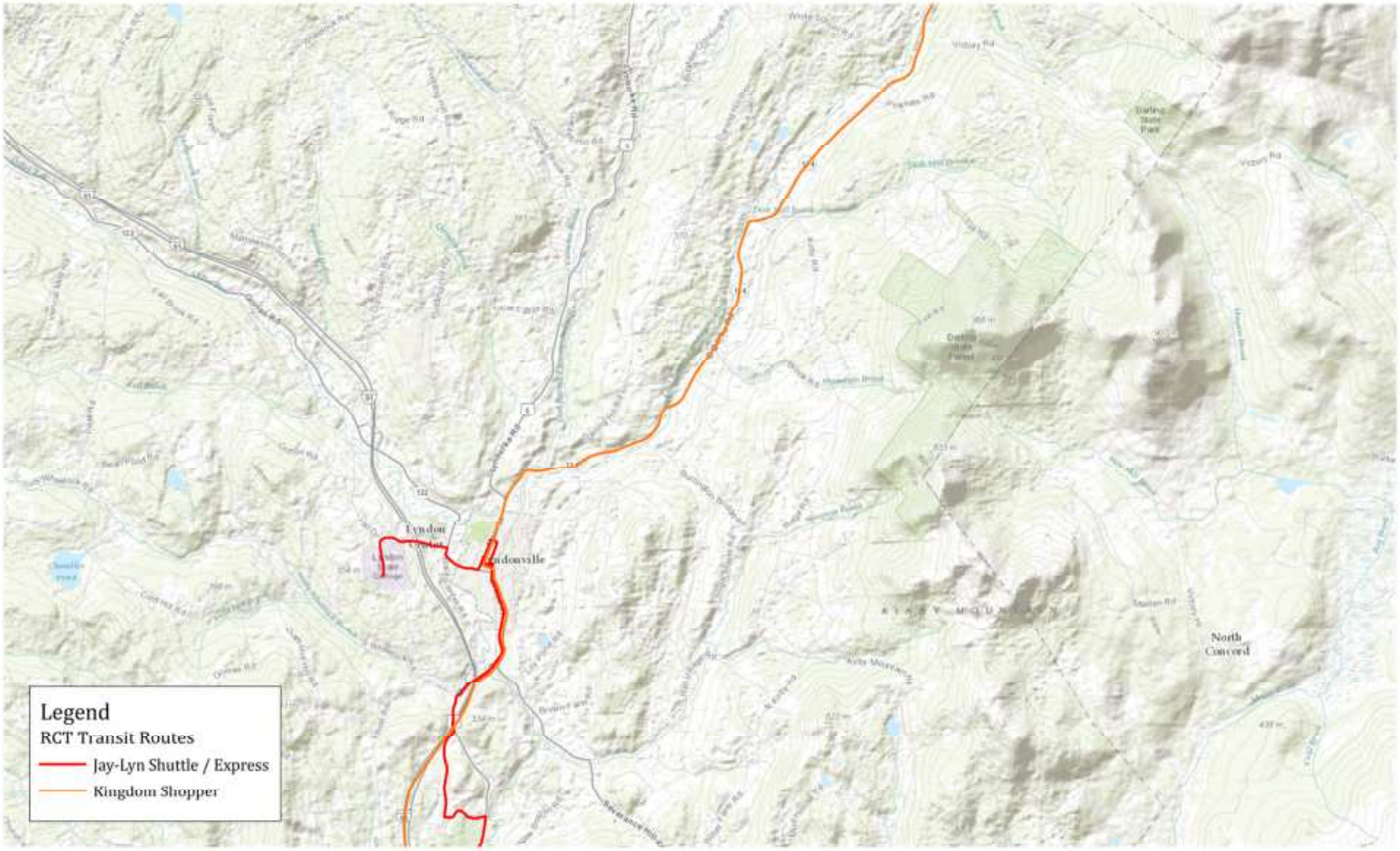


RSG INC.
June 2013

0 2.5 5 10 Miles

Transit Services Overview
New Development and Transportation/Planning Recommendations

Figure 3-13: Existing Transit Routes in Lyndon/Burke Study Area

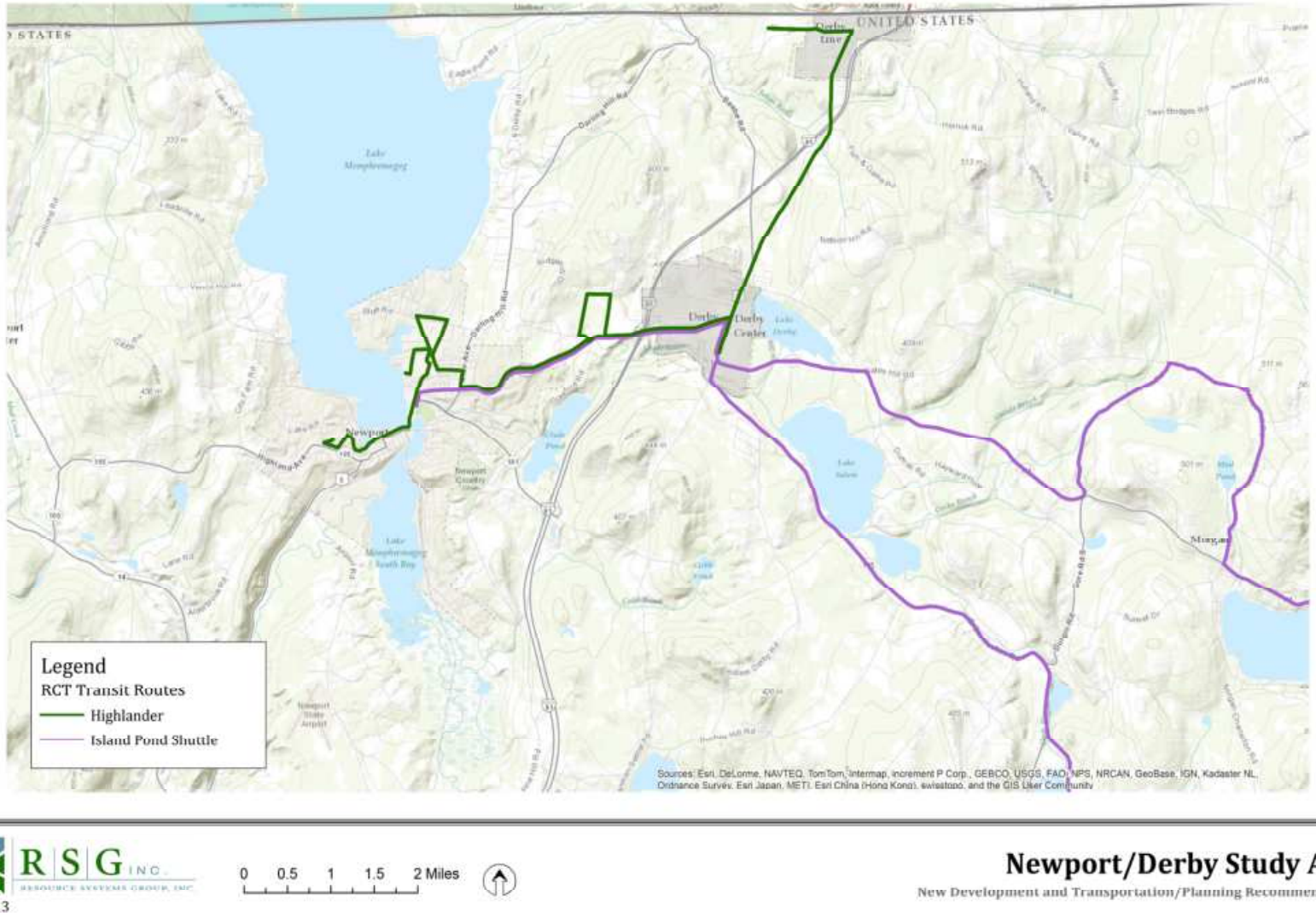


RSG INC.
June 2013

0 0.5 1 2 Miles

Burke/Lyndon Study Area
New Development and Transportation/Planning Recommendations

Figure 3-14: Existing Transit Routes in Newport/Derby Study Area



RSG INC. RESOURCE SYSTEMS GROUP, INC.
June 2013

0 0.5 1 1.5 2 Miles

Newport/Derby Study Area
New Development and Transportation/Planning Recommendations

Resort Services

Jay Peak Resort, located at the northernmost edge of the Northeast Kingdom, operates a free shuttle that travels within the resort, connecting residential locations to important mountain facilities. This includes base lodges as well as hotels and the golf clubhouse. However, the shuttle does not leave the resort and service is available only to the guests staying at the resort. During the peak season, staring from mid-December to April, shuttle runs from 5 AM to 11 PM daily, running until 2AM on the weekends depending on the demand. In addition, during the winter season, the resort offers short shuttle service to the employees who park their cars in the remote parking garage. There is no set schedule, but there are four to six active buses running constantly within the resort area. During the rest of the year (April to mid-December), the shuttle is available through on-call dispatch system and the frequency changes by the occupancy level.

Jay Peak owns two 14-passenger buses and two 18-passenger buses. To meet higher demands in the winter, the resort rents out 15-passenger buses as well. Jay Peak Resort also provides pick-up and drop-off services at Burlington International Airport and Amtrak Station for the resort guests. The price of this service varies by the location.

Burke Mountain Resort, under the same ownership of Jay Peak Resort, also operates a free shuttle service on the weekends. Burke Mountain is largely a ski resort but also attracts a lot of visitors who mountain bike at the nearby Kingdom Trails and Burke Mountain Bike Park. A shuttle runs from the center of East Burke through the entrance of Kingdom Trail at Darling Hill Road to Burke Mountain Bike Park. This shuttle service is available to the general public, although most of the passengers are mountain bikers. The resort operates a medium-sized bus that is capable of carrying approximately 20 passengers per trip with an attached trailer bed to carry the bicycles. Shuttles operate from 11 AM to 6 PM on Saturdays, and 10 AM to 4 PM on Sundays.

Because Jay Peak and Burke Mountain Resorts are owned by the same group, use of the vehicles is coordinated to meet the transportation demands.

Specialized Transportation Service (Human Service and Medical Transportation)

There are nine regional and three statewide human service agencies in the Northeast Kingdom. While most of the human service agencies are independent organizations, they are largely funded and overseen by the Vermont Agency of Human Services or the Area Agency on Aging. Of the nine agencies, two (NEK Mental Health and Green Mountain Adult Day Health) directly operate transportation services. The other agencies purchase transportation services from RCT or other providers. Human service transportation, however, is not available to members of the public and riders must qualify to use the services. Table 3-10 summarizes services available in the Northeast Kingdom.

Volunteer Drivers

Rural Community Transportation manages a volunteer driver program. Most of the trips provided in this program are to support medical trips, especially Medicaid services, although RCT will use volunteer drivers to support other transportation needs. Volunteer drivers are reimbursed for mileage expenses. RCT is responsible for collecting trip requests, organizing and training volunteer drivers and making sure the riders get to/from their destination safely and on time. There are approximately 200 volunteer drivers in RCT's database, and about 40 percent of them are "full-time" volunteer drivers. In fiscal year 2012, these drivers provided 106,825 trips.

Table 3-10: Human Service Agency Service Description

Agency	Service Area	Service Description
Green Mountain Adult Day Service	Orleans and northern Essex counties	▪ Purchases service from RCT
Disabled American Veterans	Statewide – local NEK office serves Caledonia, Essex and Orleans counties	▪ Owns vehicles operated by volunteers ▪ Purchases service from RCT
Northeast Kingdom Community Action	Caledonia, Essex and Orleans counties	▪ Purchases services from RCT ▪ Reimbursements to volunteers
Agency of Human Services – Vermont Department of Children and Families, Economic Services Division	Statewide; local office serves Caledonia and southern Essex counties	▪ Purchases transportation services from RCT and The Good News Garage
Agency of Human Services – Department of Disabilities, Aging and Independent Living, Division of Vocational Rehabilitation	Statewide; local office serves Caledonia and southern Essex counties	▪ Purchases transportation services from RCT
Area Agency on Aging for Northeastern Vermont	Caledonia, Essex and Orleans counties	▪ Purchases service from RCT
Northeast Kingdom Human Services	Caledonia, Essex and Orleans counties	▪ Direct operation of vans ▪ Purchases service from RCT
The Meeting Place	Orleans County	▪ Purchases service from RCT
Retired and Senior Volunteer Program for Central Vermont and the Northeast Kingdom	Washington, Lamoille, Caledonia, Orleans, Essex and parts of Orange counties	▪ Volunteers use their personal vehicles
Riverside Life Enrichment Center	Caledonia and southern Essex counties	▪ Purchases service from RCT
Vermont Association for the Blind and Visually Impaired	Statewide	▪ Utilizes volunteer and paid drivers ▪ Taxi services ▪ Paratransit services ▪ Purchases services from RCT

Source: Adapted from Vermont Public Transit Human Service Transportation Coordination Plan, Ch. 4
http://publictransit.vermont.gov/policies_reports/hscp

Medicaid

RCT functions as a broker for Non-Emergency Medical Transportation (NEMT) service in the Northeast Kingdom. This state and federally funded program provides transportation for Medicaid eligible individuals traveling to Medicaid eligible health care activities such as doctor appointments and prescription pick-ups. NEMT is available 24 hours a day and seven days a week; trips must be scheduled at least 24 hours in advance. There is no fare or fee to the riders. RCT functions as the broker for these trips and is responsible for taking trip requests, assigning trips, and ensuring passengers and trips meet eligibility requirements. Trips may be coordinated with other services, so that people traveling on Medicaid can ride on the same vehicle with other people traveling as part of other programs. Management of the Medicaid program for the Northeast Kingdom accounts for over half of RCT's total operating budget.

Reach Up

Reach Up is Vermont's Transitional Assistance to Needy Families (TANF) program providing assistance, including transportation service, to low-income families with children to support self-sufficiency. Both RCT and Good News Garage offer rides for eligible trips to Reach Up clients in the Northeast Kingdom.

Good News Garage is a non-profit car donation program run by Lutheran Social Services. In Vermont, Good News Garage provides rides to jobs and job-related destinations for Reach Up clients through the Ready to Go program. Good News Garage also contracts with the Economic Services Division of the Department of Children and Families to provide vehicles to participants of the Reach Up program.

Ridesharing, Carpools and Vanpools

Go! Vermont is a free carpool and vanpool program that offers a computerized matching service for commuters or people seeking regular rides to share.

Railroads

The closest passenger rail to the Northeast Kingdom is Amtrak's Vermonter service, accessible at White River Junction or Montpelier. Trains run once per day in each direction, with through service to Washington, DC.

Taxi and On-Demand Transportation

Kingdom Express is the primary operator of on-demand transportation in the Northeast Kingdom. The company is family owned and operated and based in Burke, Vermont. Its services are as follows:

- **Kingdom Express Taxi Service** remains mainly within northern Vermont and New Hampshire, but will travel throughout New England, New York and Quebec upon request. Service is available to the general public in the Newport area, and by reservation between 8:00 am and 5:00 pm.
- **Kingdom Express Charter Service** encompasses a variety of services, from charters for up to 18 people to trips to the airport. The company's fleet includes vehicles with wheelchair lifts, which can be hired to transport one or more people at a flat rate.

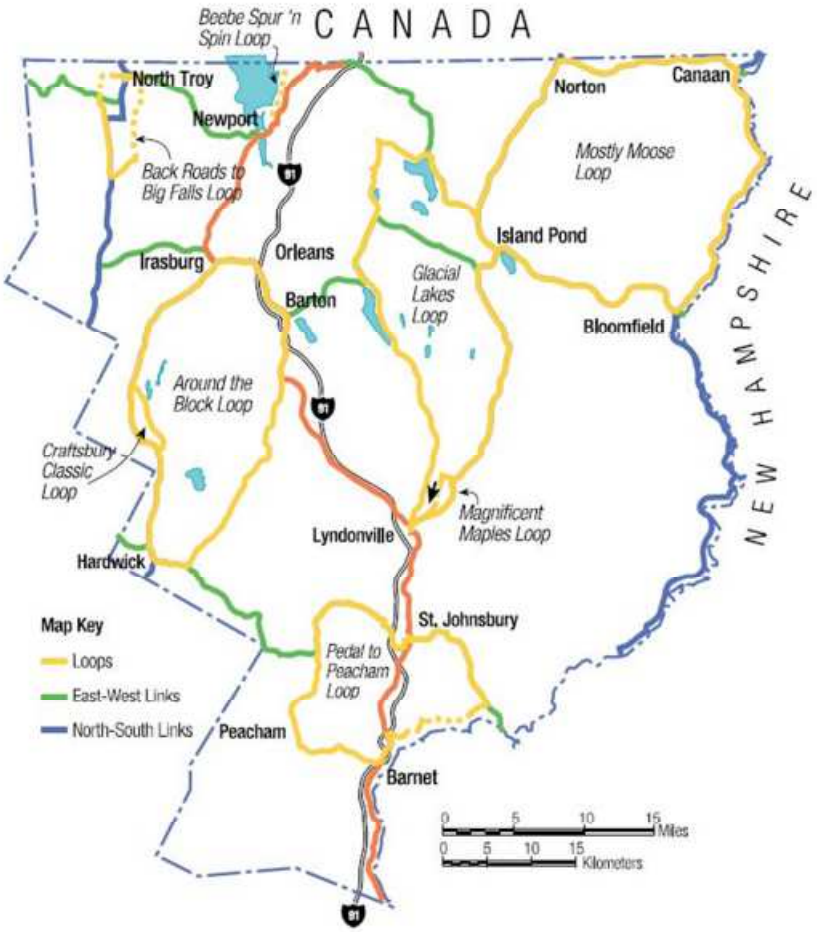
Bicycle Facilities

According to NVDA, the Northeast Kingdom has nearly 2,300 miles of ideal biking roads, of which a little over half (1,500 miles) are unpaved. The on-road routes, shown in Figure 3-15, are comprised of eight loops, five north-south links, and three east-west links. Half of the 16 bike routes connect to destinations within the study areas:

- "Back Roads to Big Falls" covers 22.4 miles around Jay, North Troy, Troy, and Westfield, intersecting with VT 242 and running north-south along Jay Road on the western leg, then connecting to VT 105 in North Troy.
- "Beebe Spur 'n Spin" covers 11.2 miles, linking from the edge of Lake Memphremagog in downtown Newport to Beebe Plain along the Beebe Spur Rail Trail parallel to the eastern edge of the lake.
- "Glacial Lakes" is a multi-day, 68.9 mile ride that starts in the south in Lyndonville and runs northeastward along VT 114 to connect to East Burke. The route continues along VT 114 until it connects at VT 111, where riders begin to head northeast towards Morgan. Eventually the ride loops around to West Charleston and the final leg runs along US 5 in West Burke back down to Lyndonville.

- "Magnificent Maples" follows the first segment of the Glacial Lakes route, starting from Lyndonville and heading up VT 114 towards East Burke. The 11.4 mile ride loops west at East Darling Hill Road and travels back south to Lyndonville.
- "North-South Link 3" is a 39.8 mile ride along paved roads and railroad trails, connecting between Lyndonville and Norton, through East Burke, along VT 114.
- "North-South Link 7" connects between Lowell in the south to North Troy near the Canada border through the Town of Jay. This route is paved and runs along VT 100, VT 242, VT 101, and VT 105.
- "North-South Link 91" runs along paved roads for 79.8 miles between the Derby Line, through Newport, and all the way south to Ryegate, through Lyndonville. The bike route travels along US 5 through Newport, with a long stretch on VT 122 down to Lyndonville, where it switches back to US 5 for the remainder of the journey south.
- "East-West Link 2" is a challenging 78.5 mile paved bike route that connects from Jay in the west to Canaan on the east. This route follows along VT 105 from Jay to Newport, where it continues on US 5 to Derby.

Figure 3-15: Northeast Kingdom On-Road Bicycle Network



3.7 SAFETY ASSESSMENT

Crash histories were collected from VTrans for the most recent 5 years of available data (January 2008-December 2012). VTrans maintains a statewide database of all reported crashes along all state highways and federal aid road segments.[6]

Additionally, the Vermont Agency of Transportation maintains a list of high crash locations (HCL), which are intersections and roadway segments that have high crash rates over five years compared to other intersections or segments with similar functional classification and traffic levels. For the most recent period of VTrans designation (2006-2010) there were 19 designated HCL road segments and no HCL intersections in the three study areas.

Crash histories and HCLs were examined by study area in the sections below.

Newport/Derby Study Area

Within this 5 year period of available data, 261 crashes were reported within the Newport/Derby Study Area. These crashes resulted in 61 injuries and 3 fatalities. Maps indicating the locations of these crashes are shown in Figure 3-16 and Figure 3-17. No recurring theme was found in the contributing circumstances reported for the crashes in this study area. The majority of crashes were the result of a rear-end incidents, with left-turn broadsides occurring as the second highest cause of accidents.

For the most recent period of VTrans designation (2006-2010), there were four study intersections located in designated HCL road segments in Newport and four in Derby. No recurring theme was found regarding land use or traffic volume at these eight HCL road segments.

[6] This data is exempt from Discovery or Admission under 23 U.S.C. 409.

Figure 3-16: Newport Crash Locations (2008-2012)

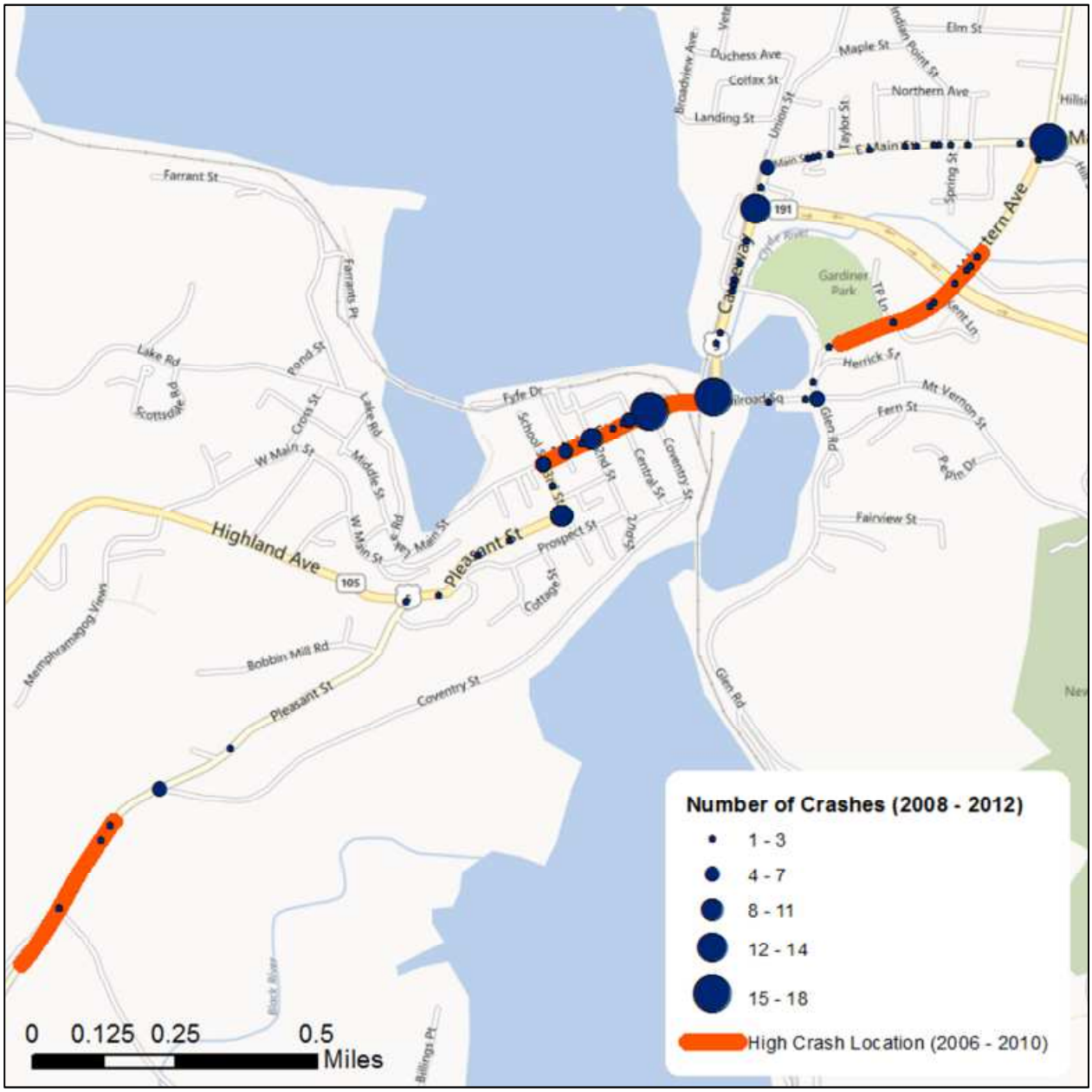
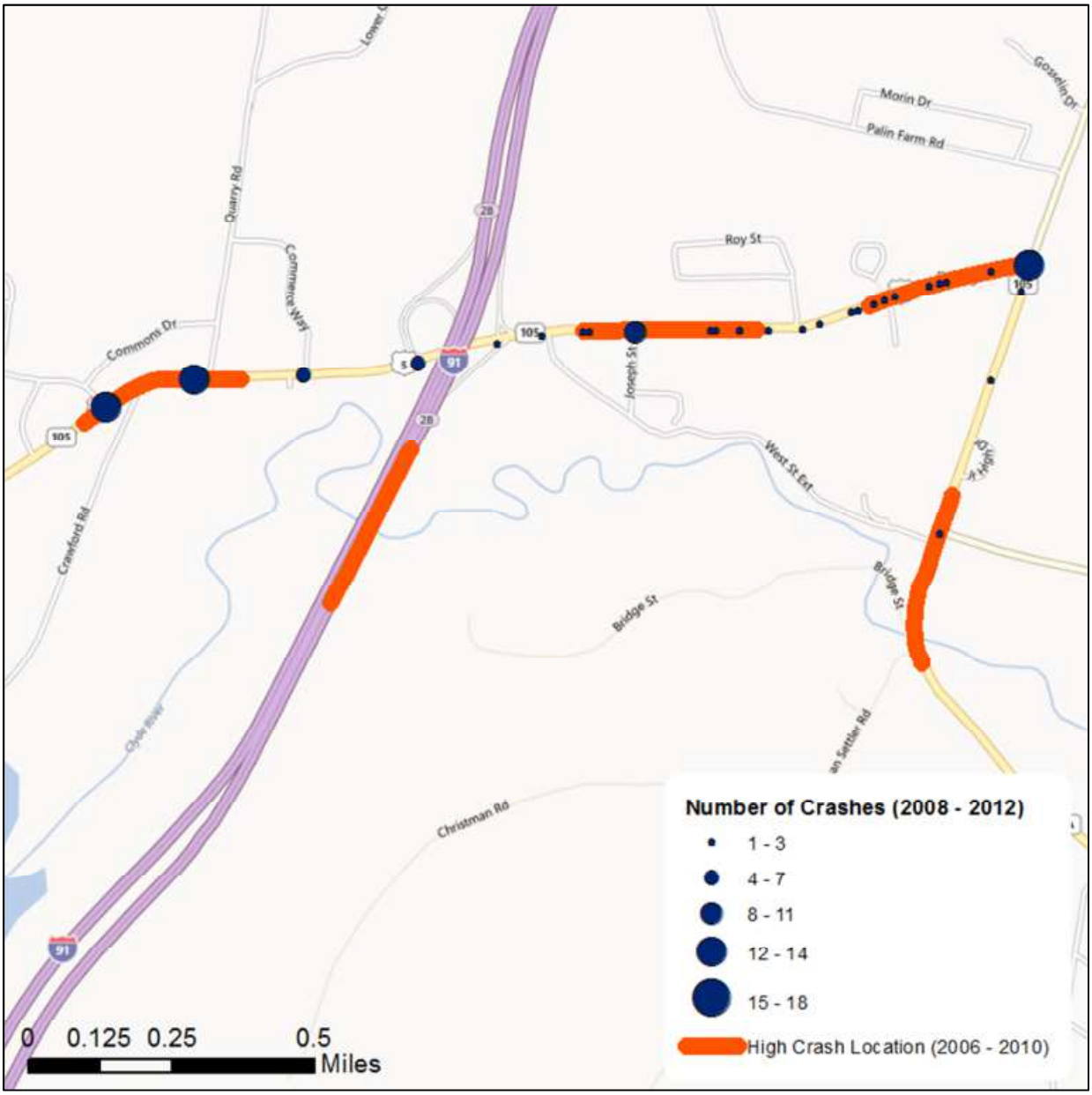


Figure 3-17: Derby Crash Locations (2008-2012)



Burke/Lyndon Study Area

Within the 5 year period of available crash data, 115 crashes were reported within the Burke/Lyndon Study Area. These resulted in 20 injuries and no fatalities. A map of these crashes is presented below (Figure 3-18 and Figure 3-19). No recurring theme was found in the contributing circumstances reported for these crashes in this study area. The majority of crashes are the result of a rear-end incidents, with left-turn broadsides occurring as the second highest cause of accidents.

For the most recent period of VTrans designation (2006-2010) there were four study intersections located in designated HCL road segments in Lyndon and none in Burke. These crash locations are generally located in commercial areas where there are a large number of driveways and side streets with no traffic control.

Figure 3-18: Burke Crash Locations

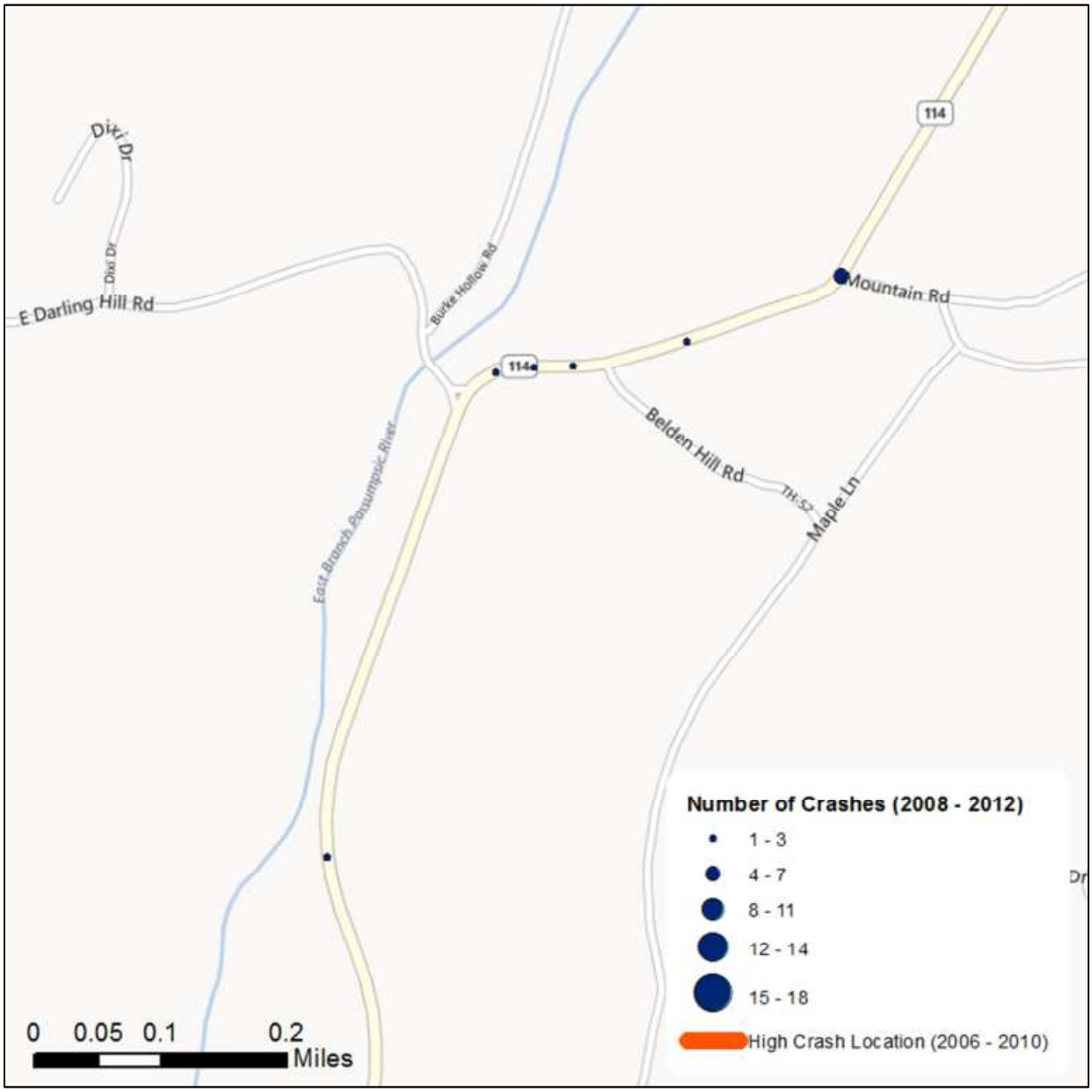
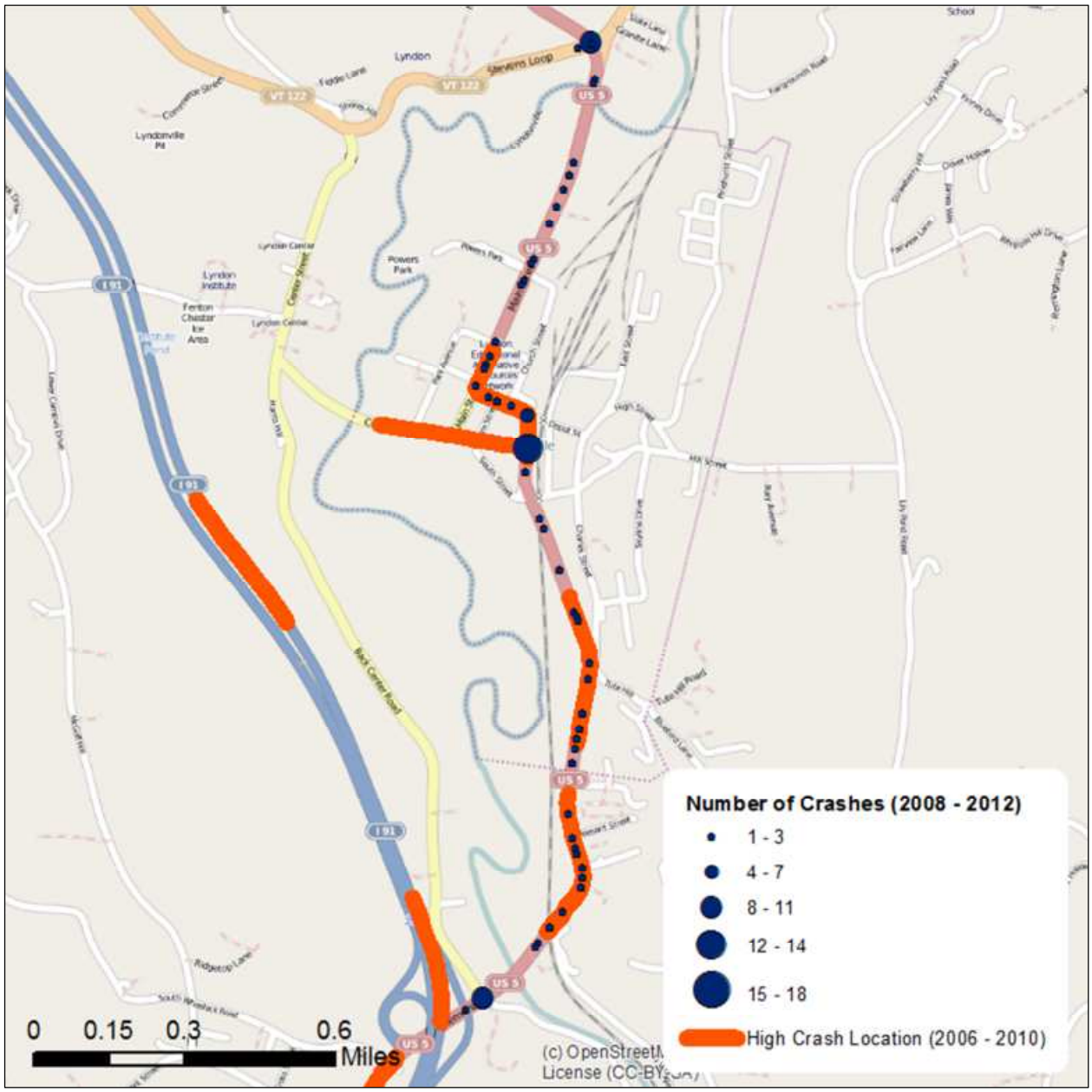


Figure 3-19: Lyndon Crash Locations

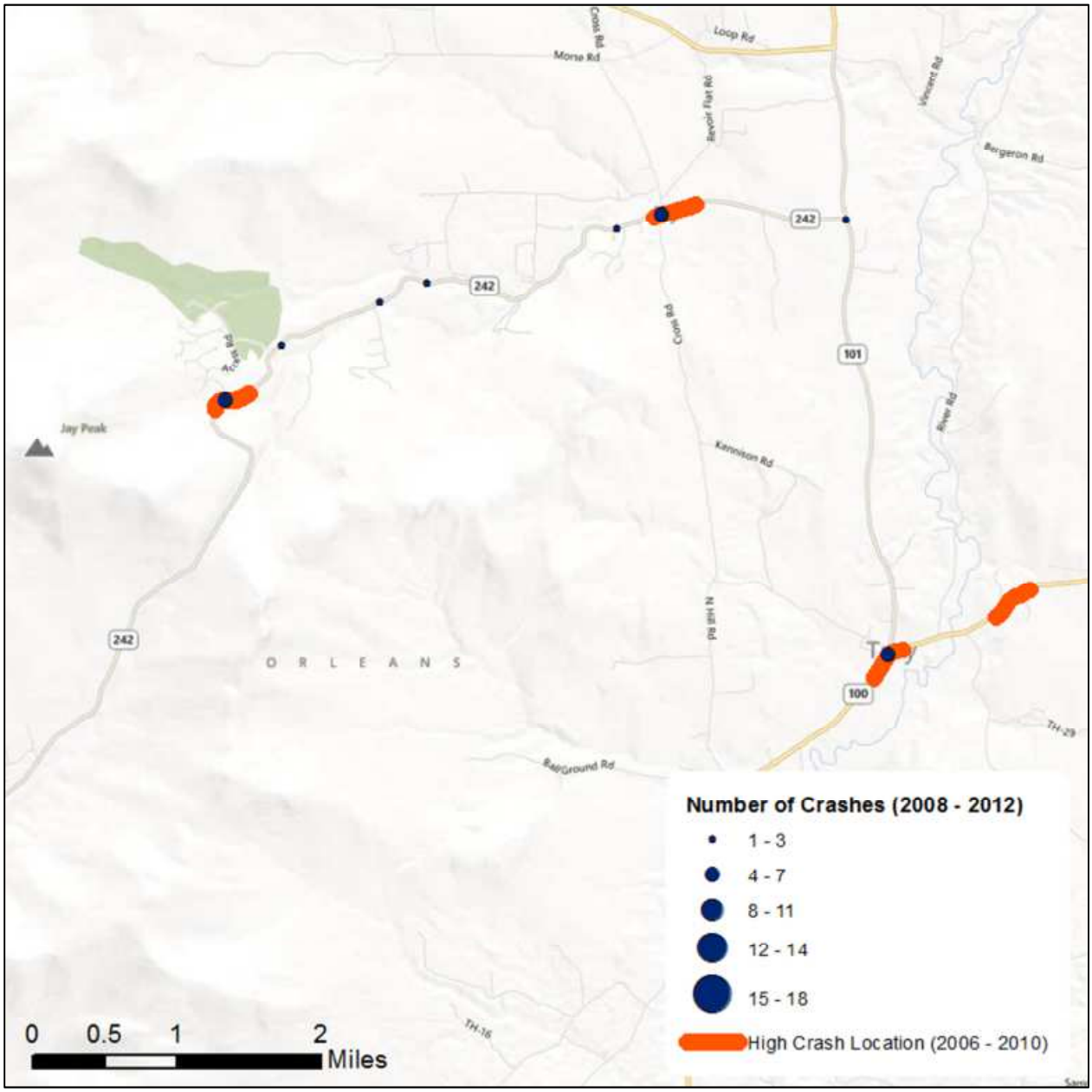


Jay Study Area

Within the 5 year period of available crash data, 22 crashes were reported within the Jay Study Area. These resulted in 10 injuries and 0 fatalities. A map of these crashes is presented below (Figure 3-20). Forty-one percent of the crashes along VT 242 were due to 'driving too fast for conditions'. The majority of crashes resulted in rear-end and single vehicle incidents.

For the most recent period of VTrans designation (2006-2010) there were four study intersections located in designated HCL road segments in the Jay Study Area. No recurring theme was found regarding land use or traffic volume at these HCL road segments.

Figure 3-20: Jay Peak Area Crash Locations



4 LOCAL CONCERNS MEETINGS

Two Local Concerns Meetings were held in August 2013, one in Newport and one in Lyndonville. During these meetings, RSG and NVDA gave a brief presentation outlining the objectives of the study and highlighting several of the findings that came out of the Existing Conditions assessment. An informal question and answer with the project team and community members followed the presentation. At the end of the evening, community members were invited to speak one-on-one to representatives of the project team. A summary of the comments received during these two sessions are provided below; all relevant meeting materials can be found in Appendix A.

4.1 NEWPORT/JAY

This meeting was held on August 22, 2013 at the Gateway Center in Newport from 6:00pm to 8:00pm; it was held in conjunction with the Newport Community Commons Meeting.

General Comments

- How does the effort tie into the bus tour with legislators several months ago?
    - This study will integrate with previous studies and involve State Representatives
- Important to emphasize solutions for all users and not only focus on EB-5
- Important to identify improvements that can be implemented in the short-term
- R/UDAT Plan may be relevant to the study

Operational Comments

- Roundabout at Coventry and Main has been discussed by the Mayor. Could a roundabout fit here and at Railroad Square?
- The traffic peaks for hospital and schools is 7:00am and 3:00pm
- Slow trucks on VT 14 on the way to landfill in Coventry
- Check signal timings on Causeway
- Traffic delays on southbound US 5 are sometimes a problem in Derby Line due to queues at border crossing
- Congestion for east-west traffic through town
- US 5/VT 105 intersection delays; need a signal or an all-way stop
- Safety issues at Railroad Square intersection
- Safety issues at Darling Hill and Shattuck Hill intersection ought to be addressed
    - Included as a High Risk Rural Roads candidate a couple years back; will check status

Transit, Bicycle, and Pedestrian Comments

- Build more bicycle lanes and augment transit service to fix the problem; do not expand roads endlessly
- Would support additional transit service, including Newport-Jay Peak connection

- Will additional transit be factored into our assessment?
    - Yes
- What locations are appropriate for park & ride facilities?
- Will rail be considered for this study?
    - No, not in this study
- Consider Complete Streets for downtown Newport
- Newport Renaissance is looking at a better-connected bicycle system
- Complete Streets and bicycle facilities will help to encourage new employers and employees to locate in Newport
- Generally unsafe conditions for bicyclists; need to add "Share the Road" signs indicating the presence of bicyclists, particularly on hills
- Need to identify adjustments to downtown Newport to improve multimodal trips

4.2 LYNDON/BURKE

This meeting was held on August 28, 2013 at the Public Safety Building in Lyndonville from 6:00pm to 8:00pm; it was held in conjunction with the Lyndon Planning Commission meeting.

General Comments

- Doesn't seem like there is going to be any mitigation for moving Cumberland Farms
- Broad Street is the number 1 issue in the study area
    - Limit access points
    - Add center lane to protect left turns
    - Very little room to widen road
    - The scope of these improvements are not realistic from a budgetary standpoint

Operational Comments

- Red Village Road/Lily Pond Road is used as a shortcut to Burke and could be used even more frequently if downtown Lyndonville becomes more congested with future growth.
    - Supposedly the connection is okay, and not very unsafe, but is a narrow dirt road and thus shouldn't be seeing too much re-routing traffic
    - The bridge on Lily Pond Road just south of VT 114 is very narrow
    - Back Center > Center > 122 is also used as a shortcut. Covered bridge right before joining 122 is only one lane and cannot fit an 18 wheeler. Has been an issue in the past
- Current Trustees believe that the 3-way stop at Broad/Depot in downtown Lyndonville is the correct solution; however the majority of others support different solution
    - Queues can back up almost all the way to Rite Aid, more than 1/2 mile from the intersection

- Max congestion in downtown Lyndonville is when the industrial park lets out at 3pm
- Realistically the town would be happy with fixing the Depot St/Red Village Road intersections

Transit, Bicycle, and Pedestrian Comments

- Better scheduling needed for bus connections in Montpelier for trips from Lyndon > Burlington
    - This connection may have already been improved
- Steven's Loop is not safe for running
- VT 122 needs shoulder widening for peds/bikes
- Major pedestrian movement is from the students up on the hill down to the services on Broad Street; sidewalks needed on Center St to accommodate students
- Kingdom Trails parking issues/way too many bikers in downtown
- The Back Center/US 5 signal was temporary but then just stayed in. Need to check signal timing as it was indicated that the movement from Back Center has virtually no green time.
- Lots of bikes on US 5

5 FUTURE TRAFFIC CONDITIONS

This section presents future year traffic projections for the study intersections in the three project study areas. These projections are based on an estimated trip generation resulting from the identified EB-5 projects as well as other identified initiatives around the region. Additionally, background traffic has been estimated to represent the anticipated traffic growth that is expected over the planning horizon over and above the specific developments identified in this section.

The estimated future traffic resulting from these two components was distributed onto the surrounding transportation network using standard procedures. For residential, retail, and employment-based trips, a combination of Census Journey-to-Work data and background trip distributions was used. For resort related trips, the Jay Peak and Burk Mountain traffic permitting documents and the 2006 Jay Peak trip distribution data was used.

With the trip generation and distribution completed, the base year traffic congestion was analyzed for the afternoon peak hour to determine whether any new intersection "hotspots" are expected to emerge in the future, and the extent to which existing operational deficiencies will worsen. This scenario, referred to as the No Build Scenario, maintains today's infrastructure and does not consider any of the proposed infrastructure improvements described in Section 2.1 or Section 2.2. To account for the potential benefit of proposed infrastructure improvements at locations where significant operational deficiencies have been identified, a second scenario, referred to as the Preliminary Build Scenario, was developed.

5.1 DEVELOPMENT ASSUMPTIONS

Due to the uncertainty of timelines associated with projects that are currently at various stages in the project development process, two future year scenarios have been evaluated to reflect projected traffic conditions in 2019 and 2024. The specific developments included in each scenario are described below.

EB-5 Projects

Based upon local knowledge and input received from the Project Steering Committee, 50 percent of the full-build out of EB-5 projects was included in the 2019 Scenario, while 100 percent of the full-build out was included in the 2024 Scenario.

- Jay Peak Resort – Stateside Expansion: includes condos, hotel, and a new lift
- Jay Peak Resort – West Bowl Development: includes condos, hotel, and 3 new lifts
- Jay Village Project: includes hotel and a multi-use recreation facility
- AncBio Vermont: new research and development facility on Bogner Drive in Newport
- Menck Window Systems: new manufacturing facility on Bogner Drive in Newport
- Newport Marina Hotel and Conference Center: includes hotel and conference center
- Newport Renaissance Block: includes hotel, office, and retail
- Burke Mountain Lodge Expansion: includes new hotels

Other Future Developments

Based upon local knowledge and input received from the Project Steering Committee, all developments noted below were included in the 2019 Scenario, with the exception of Lowe's, which was included in the 2024 Scenario.

- Newport Airport: includes a new passenger terminal
- Walmart: planned Supercenter in Derby
- Lowe's: planned home improvement store in Derby
- Louis Garneau: relocated/expanded outerwear factory and retail outlet under construction in Derby
- Sticks and Stuff Hardware/Lumber Store: planned at the former IROC site in Derby
- CVS: planned drugstore in Derby
- 338 Highland Avenue: permit issued for residential conversion at site of old hospital in Newport
- Maplefields: new gas station and convenience store in Newport
- Cumberland Farms: relocated and expanded gas station/convenience store in Lyndonville

5.2 CONGESTION ANALYSIS

The congestion analysis compares existing conditions (2014 No Build) with four future year scenarios:

- 2019 No Build – Conditions representing a 5-year horizon without any improvements to study intersections
- 2019 Build – Conditions representing a 5-year horizon including previously recommended/studied improvements to study intersections
- 2024 No Build – Conditions representing 10-year horizon without any improvements to study intersections
- 2024 Build – Conditions representing a 10-year horizon including previously recommended/studied improvements to study intersections

It should be noted that all signal timings were optimized in the two build scenarios, even at study intersections where there were no previously recommended/studied improvements.

Newport Study Intersections

Table 5-1 summarizes intersection operating conditions for the ten study intersections located in Newport for existing conditions and four future year scenarios.

Table 5-1: Level-of-Service Results (Newport Intersections)

Newport Intersections	Peak Hour 2014 No Build LOS	Delay	v/c	2019 No Build LOS	Delay	v/c	2019 Build LOS	Delay	v/c	2024 No Build LOS	Delay	v/c	2024 Build LOS	Delay	v/c
1. Main St / Lake Rd															
EB, Exiting W Main St	A	8	0.10	A	9	0.18	A	9	0.18	A	9	0.19	A	9	0.19
WB, Exiting Main St	B	10	0.43	B	12	0.54	B	12	0.54	B	14	0.60	B	14	0.60
SB, Exiting Lake Rd	A	9	0.16	B	10	0.25	B	10	0.25	B	11	0.31	B	11	0.31
2. US 5 / Main and School St*															
EB, along Main St	B	15	-	C	17	-	C	19	-	D	30	-	E	40	-
WB, along US 5	A	4	-	A	5	-	A	4	-	A	5	-	A	5	-
NB, along US 5	B	14	-	C	17	-	C	18	-	D	25	-	C	25	-
SB, exiting School St	B	12	-	C	19	-	C	16	-	C	17	-	C	15	-
3. US 5 / Coventry St															
Overall	C	25	0.59	C	32	0.71	C	27	0.65	E	65	0.78	C	29	0.69
EB, along US 5	C	29	-	D	46	-	C	30	-	F	>100	-	C	32	-
WB, along US 5	B	20	-	C	23	-	C	21	-	C	26	-	C	23	-
NB, exiting Coventry St	C	27	-	C	28	-	C	34	-	C	28	-	D	35	-
SB, exiting Lane St	C	29	-	C	31	-	D	40	-	C	33	-	D	44	-
4. US 5 / Mt Vernon St*															
EB Left, along US 5	A	3	-	A	4	-				A	4	-			
EB Through/Right, exiting US 5	A	2	-	A	2	-				A	2	-			
WB, exiting Railroad Sq	F	>100	-	F	>100	-		N/A		F	>100	-		N/A	
NB, exiting Poulin Grain Dr	F	71	-	F	>100	-				F	>100	-			
SB, along US 5	C	16	-	F	81	-				F	>100	-			
4. US 5 / Mt Vernon St															
Overall							C	24	0.75				C	28	0.81
EB, exiting US 5							C	26	-				C	33	-
WB, exiting Railroad Sq		N/A			N/A		D	45	-		N/A		D	47	-
NB, exiting Poulin Grain Dr							D	40	-				D	41	-
SB, along US 5							B	17	-				B	19	-
5. US 5 / VT 191															
Overall	B	15	0.68	B	19	0.83	B	19	0.83	C	28	0.90	C	28	0.90
WB, exiting VT 191	C	24	-	C	25	-	C	25	-	C	26	-	C	26	-
NB, along US 5	B	16	-	C	25	-	C	25	-	D	41	-	D	41	-
SB, along US 5	A	8	-	A	9	-	A	9	-	B	10	-	B	10	-
6. US 5 / Union St															
Overall	B	11	0.46	B	15	0.54	B	15	0.54	B	17	0.57	B	17	0.57
WB, along US 5	C	23	-	C	24	-	C	24	-	C	25	-	C	25	-
NB, along US 5	A	3	-	A	10	-	A	10	-	B	13	-	B	13	-
SB, exiting Union St	A	10	-	B	11	-	B	11	-	B	12	-	B	12	-
7. US 5 / Airport Rd															
WB, Exiting Airport Rd	A	9	0.03	A	9	0.03	A	9	0.03	A	9	0.04	A	9	0.04
SB, along US 5	A	7	0.02	A	7	0.02	A	7	0.02	A	7	0.02	A	7	0.02
8. VT 105 / Logan Dr															
EB, along VT 105	A	8	0.00	A	8	0.01	A	8	0.01	A	8	0.01	A	8	0.01
SB, exiting Logan Dr	B	11	0.02	B	12	0.04	B	12	0.04	B	13	0.05	B	13	0.05
9. VT 105 / Alderbrook Rd															
WB, along VT 105	A	8	0.07	A	8	0.08	A	8	0.08	A	8	0.09	A	8	0.09
NB, exiting Alderbrook Rd	B	10	0.10	B	11	0.13	B	11	0.13	B	11	0.14	B	11	0.14
10. VT 105 / US 5															
WB, along US 5	A	8	0.03	A	8	0.03	A	8	0.03	A	8	0.04	A	8	0.04
NB, along US 5	B	10	0.06	B	11	0.09	B	11	0.09	B	12	0.10	B	12	0.10

Notes: * denotes an intersection where SimTraffic was used to calculate delay.
N/A is shown for scenarios where the control type was modified from stop- to signal-controlled.

The congestion analysis results indicate that intersection approaches at the following three study intersections are expected to deteriorate to unacceptable levels during the peak hour for one or more of the future year study scenarios:

Main Street (US 5/VT 105)/School Street/Third Street

The eastbound approach at this intersection is projected to operate at LOS E in the 2024 Build Scenario. Operations at this intersection are projected to worsen in build scenarios due to signal optimization at the US 5/Coventry Street intersection, located approximately 1,200 feet to the east. Due to the proximity of the two intersections, signal optimization results in more vehicles arriving at Main Street/School Street/Third Street, which incurs additional delay. Improvements to this intersection have not previously been studied or

recommended; therefore, this intersection will be evaluated for potential improvements in Section 6 of this Plan.

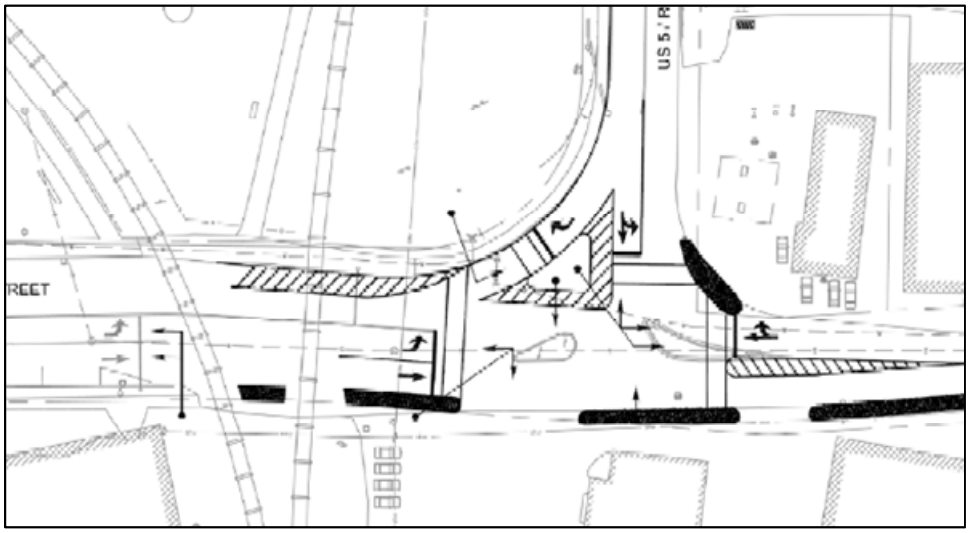
US 5/Coventry Street

The eastbound approach is projected to cause the intersection to operate at LOS E in the 2024 No Build Scenario. Signal optimization at this intersection improves operating conditions to acceptable levels (LOS C) for this scenario.

Main Street (US 5/VT 105)/ Causeway/Railroad Square

The westbound, northbound, and southbound approaches are projected to operate at LOS F in both future year no build scenarios. This intersection has been the subject of previous studies, including the *Newport City Thoroughfare Plan* (NVDA, 2010), which included three alternative improvements to address operational deficiencies. The alternative that included intersection signalization was selected for inclusion in this Plan, and is shown below in Figure 5-1.

Figure 5-1: Railroad Square Intersection Signalization Diagram



Source: *Newport City Thoroughfare Plan* (NVDA, 2010)

This alternative was selected because it provided the highest level of congestion relief with the lowest expected impact to adjacent intersections and regional access. Signalization at this intersection improves operating conditions to acceptable levels (LOS C) for both future year build scenarios.

Derby Study Intersections

Table 5-2 summarizes intersection operating conditions for the six study intersections located in Derby for existing conditions and four future year scenarios.

Table 5-2: Level-of-Service Results (Derby Intersections)

Derby Intersections	Peak Hour 2014 No Build LOS	Delay	v/c	2019 No Build LOS	Delay	v/c	2019 Build LOS	Delay	v/c	2024 No Build LOS	Delay	v/c	2024 Build LOS	Delay	v/c
1. US 5 / Shattuck Hill Rd and Crawford Rd															
Overall	B	17	0.59	C	22	0.77	C	22	0.77	C	24	0.80	C	24	0.80
EB, exiting Shattuck Hill Rd	C	30	-	C	33	-	C	33	-	D	36	-	D	36	-
WB, exiting Crawford Rd	B	18	-	C	21	-	C	21	-	C	21	-	C	21	-
NB, along US 5	B	14	-	C	21	-	C	21	-	C	22	-	C	22	-
SB, along US 5	B	14	-	C	20	-	C	20	-	C	21	-	C	21	-
2. US 5 / Quarry Rd															
Overall	B	13	0.53	D	47	0.75	B	17	0.72	E	74	0.81	B	19	0.77
EB, exiting Quarry Rd	B	12	-	B	13	-	B	16	-	B	13	-	B	19	-
WB, exiting Parking Lot	B	11	-	B	11	-	B	14	-	B	10	-	B	14	-
NB, along US 5	B	14	-	E	75	-	B	20	-	F	>100	-	C	20	-
SB, along US 5	B	12	-	C	27	-	B	15	-	E	58	-	B	17	-
3A. US 5 / I91 SB Ramps															
EB Left, exiting US 5	A	9	0.09	A	9	0.13	A	9	0.13	A	10	0.15	A	10	0.15
SB Left, exiting I91 SB	D	31	0.06	F	63	0.13	F	63	0.13	F	77	0.15	F	77	0.15
SB Right, exiting I91 SB	B	12	0.07	B	14	0.18	B	14	0.18	C	15	0.20	C	15	0.20
3B. US 5 / I91 NB Ramps															
EB Left, exiting US 5	A	9	0.04	A	9	0.10	A	9	0.10	A	10	0.11	A	10	0.11
NB Left, exiting I91 NB	C	25	0.26	F	75	0.60	F	75	0.60	F	>100	0.73	F	>100	0.73
NB Right, exiting I91 NB	B	14	0.11	C	17	0.15	C	17	0.15	C	18	0.17	C	18	0.17
4. US 5 and West St															
WB, US 5	A	9	0.00	A	10	0.00	A	10	0.00	B	10	0.00	B	10	0.00
NB, exiting West St	C	21	0.10	D	31	0.17	D	31	0.17	E	36	0.21	E	36	0.21
5. US 5 / VT 105															
EB Left, along US 5	D	25	0.54	F	>100	0.99	N/A			F	>100	1.17	N/A		
EB Right, exiting US 5	B	12	0.38	B	14	0.54				C	15	0.58			
NB, along VT 105	A	8	0.15	A	9	0.22				A	9	0.24			
5. US 5 / VT 105															
Overall	N/A			N/A			B	12	0.66	N/A			B	14	0.71
EB, exiting US 5							B	13	-				B	14	-
NB, along VT 105							B	16	-				B	18	-
SB, exiting US 5							A	8	-				A	8	-
6. VT 105 / VT 111															
WB, exiting VT 111	B	12	0.24	B	14	0.33	B	14	0.33	B	15	0.36	B	15	0.36
SB, along VT 105	A	8	0.12	A	8	0.16	A	8	0.16	A	8	0.17	A	8	0.17

Note: N/A is shown for scenarios where the control type was modified from stop- to signal-controlled.

The congestion analysis results indicate that intersection approaches at the following four study intersections are expected to deteriorate to unacceptable levels during the peak hour for one or more of the future year study scenarios:

US 5/Quarry Road

The northbound approach (US 5) is projected to cause the intersection to operate at LOS E in the 2024 No Build Scenario. Signal optimization at this intersection improves operating conditions to acceptable levels (LOS B) for this scenario.

US 5/I-91 Ramps

Left turns onto US 5 from the southbound and northbound I-91 off-ramps are projected to operate at LOS F in all future year scenarios. The northbound I-91 off-ramp was studied as part of the Louis Garneau development currently under construction in the northeast quadrant of the I-91 Interchange. It was identified as failing (LOS F) during the peak; however no improvements were recommended and that study indicated that intersection signalization was unwarranted. Both off-ramp intersections will be evaluated for potential improvements in Section 6 of this Plan.

US 5/West Street

The northbound approach (exiting West Street) is projected to operate at LOS E in 2024. Improvements to this intersection have not previously been studied or recommended; therefore, this intersection will be evaluated for potential improvements in Section 6 of this Plan.

US 5/VT 105

The eastbound approach (left turns from US 5 onto VT 105) is projected to operate at LOS F in both future year no build scenarios. This intersection has been the subject of previous studies, including the *Intersection Study for the US 5/VT 5A/VT 105 Intersection in the Town of Derby, Vermont* (NVDA, 2007), which recommended that the intersection be signalized to address operational deficiencies). Signalization at this intersection was included in this Plan and improves operating conditions to acceptable levels (LOS B) for both future year build scenarios.

Burke Study Intersections

Table 5-3 summarizes intersection operating conditions for the two study intersections located in Burke for existing conditions and four future year scenarios. The congestion analysis results indicate that both intersections are projected to operate at LOS C or better conditions for all future year scenarios.

Table 5-3: Level-of-Service Results (Burke Intersections)

	Peak Hour														
	2014 No Build			2019 No Build			2019 Build			2024 No Build			2024 Build		
Burke Intersections	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c
1. VT 114 / Mountain Rd															
WB, exiting Mountain Rd	B	15	0.50	C	17	0.59	C	17	0.59	C	21	0.69	C	21	0.69
SB, along VT 114	A	7	0.00	A	8	0.01	A	8	0.01	A	8	0.01	A	8	0.01
2. VT 114 / Burke Hollow															
EB, exiting Burke Hollow Rd	B	13	0.10	B	14	0.11	B	14	0.11	B	15	0.13	B	15	0.13
NB, along VT 114	A	8	0.02	A	9	0.02	A	9	0.02	A	9	0.02	A	9	0.02

Lyndon Study Intersections

Table 5-4 summarizes intersection operating conditions for the five study intersections located in Lyndon for existing conditions and four future year scenarios.

Table 5-4: Level-of-Service Results (Lyndon Intersections)

Lyndon Intersections	Peak Hour														
	2014 No Build			2019 No Build			2019 Build			2024 No Build			2024 Build		
	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c
1. US 5 / VT 114 and VT 122															
Overall	B	11	0.66	B	12	0.72	B	12	0.72	B	13	0.75	B	13	0.75
EB, exiting VT 122	A	8	-	A	8	-	A	8	-	A	8	-	A	8	-
WB, exiting VT 114	B	12	-	B	12	-	B	12	-	B	13	-	B	13	-
NB, along US 5	B	12	-	B	13	-	B	13	-	B	14	-	B	14	-
SB, along US 5	B	11	-	B	12	-	B	12	-	B	13	-	B	13	-
2. Depot St./Main St*															
EB, exiting Maple St	B	15	-	C	17	-	C	19	-	D	30	-	E	40	-
WB, along US 5	A	4	-	A	5	-	A	4	-	A	5	-	A	5	-
NB, exiting Main St	B	14	-	C	17	-	C	18	-	D	25	-	C	25	-
SB, along US 5	B	12	-	C	19	-	C	16	-	C	17	-	C	15	-
3. US 5/Depot St/Broad St							*						*		
EB Through exiting US 5	B	11	0.13	B	11	0.14	C	20	-	B	11	0.14	D	27	-
EB Right, along US 5	C	19	0.62	C	24	0.71	B	13	-	D	30	0.78	C	19	-
WB Left, exiting Depot St	B	13	0.21	B	13	0.22	C	21	-	B	13	0.23	D	29	-
WB Through, exiting Depot St	B	11	0.14	B	12	0.15	C	15	-	B	12	0.15	C	19	-
NB Left, along US 5	F	64	0.91	F	>100	1.05	A	2	-	F	>100	1.15	A	2	-
NB Right, exiting US 5	A	9	0.12	A	10	0.13	A	<1	-	A	10	0.13	A	1	-
SB, exiting Angies Alley	B	10	0.04	B	11	0.04	B	11	-	B	11	0.04	B	14	-
4. US 5 / Red Village Rd															
WB, exiting Red Village Rd	D	30	0.50	E	39	0.59	N/A			F	52	0.67	N/A		
SB Left, exiting US 5	A	10	0.09	A	10	0.09				B	10	0.10			
4. US 5 / Red Village Rd															
Overall	N/A			N/A			B	13	0.70	N/A			B	15	0.73
WB, exiting Red Village Rd							C	29	-				C	29	-
NB, along US5							B	16	-				B	20	-
SB, along US 5							A	4	-				A	5	-
5. US 5 / Back Center Rd and Calkins Dr															
Overall	A	6	0.56	A	7	0.59	A	7	0.60	A	7	0.62	A	7	0.63
EB, Exiting Back Center Rd	C	21	-	C	22	-	C	21	-	C	24	-	C	22	-
WB, exiting Calkins Dr	B	20	-	C	21	-	C	20	-	C	22	-	C	21	-
NB, along US 5	A	6	-	A	6	-	A	6	-	A	6	-	A	7	-
SB, along US 5	A	4	-	A	4	-	A	4	-	A	4	-	A	4	-

Notes: * denotes an intersection where SimTraffic was used to calculate delay.
N/A is shown for scenarios where the control type was modified from stop- to signal-controlled.

The congestion analysis results indicate that intersection approaches at the following three study intersections are expected to deteriorate to unacceptable levels during the peak hour for one or more of the future year study scenarios:

Main Street (US 5)/Depot Street

The eastbound approach (exiting from Maple Street) at this intersection is projected to operate at LOS E in the 2024 Build Scenario. Operations at this intersection are projected to worsen in build scenarios due to a proposed improvement at the Depot Street (US 5)/Broad Street intersection, located approximately 500 feet to the east. Due to the proximity of the two intersections, the improvement at Depot Street (US 5)/Broad Street would result in more westbound vehicles arriving at Main Street (US 5)/Depot Street, which incurs additional delay. Improvements to this intersection have not previously been studied or recommended; therefore, this intersection will be evaluated for potential improvements in Section 6 of this Plan.

Depot Street (US 5)/Broad Street

The northbound approach (left turns from Broad Street onto Main Street) currently operates at LOS F and is projected to continue to fail in both future year no build scenarios. This intersection has been the subject of previous studies, including the *Burke Mountain Area Transportation Infrastructure Study* (NVDA, 2007), which included three alternative improvements to address operational deficiencies: all-way stop, intersection signalization, and a roundabout. The study also evaluated several one-way traffic circulation schemes for

travel throughout downtown Lyndonville. Shortly after the study was completed, a decision was made by Town officials to implement the all-way stop alternative despite its impacts to delay at the intersection.

As part of the two future year build scenario, this Plan includes reverting back to the original condition of the intersection (prior to 2008), in which travel along US 5 is uncontrolled and traffic traveling westbound on Depot Street is stop-controlled. This alternative was selected because it provided the highest level of congestion relief with the lowest expected impact to adjacent intersections and regional access. Additionally, input provided by Steering Committee members and the public at the Local Concerns Meeting indicates a high-level of support for this modification. This modification to intersection control would result in improved operating conditions (LOS D or better) for both future year build scenarios.

US 5/Red Village Road

The westbound approach (turning onto US 5 from Red Village Road) at this intersection is projected to operate at LOS E in the 2019 Build Scenario and LOS F in the 2024 Build Scenario. Improvements at this intersection have been discussed in previous studies, including the *Lyndon Area Corridor Management Plan* (NVDA, 2008). This study indicated that VTrans is currently developing plans for signalizing and improving this intersection to address the difficulty of making left turns onto US 5 from Red Village Road. Consistent with this discussion, intersection signalization was included in this Plan and was found to improve operating conditions to acceptable levels (LOS B) for both future year build scenarios. It is important to note that there is an active rail crossing on the west side of the intersection, which needs to be factored into the signal/ striping design.

Jay Study Intersections

Table 5-5 summarizes intersection operating conditions for the five study intersections located in Jay for existing conditions and four future year scenarios.

Table 5-5: Level-of-Service Results (Jay Peak Area Intersections)

Jay Peak Area Intersections	Peak Hour 2014 No Build LOS	Delay	v/c	2019 No Build LOS	Delay	v/c	2019 Build LOS	Delay	v/c	2024 No Build LOS	Delay	v/c	2024 Build LOS	Delay	v/c
1. VT 242 / Jay Access Road															
EB, along VT 242	A	7	0.02	N/A			N/A			N/A			N/A		
SB, exiting Jay Peak Resort	C	17	0.64												
1. VT 242 / NEW Jay Access Road															
EB, along VT 242	N/A			A	7	0.01	A	7	0.01	A	8	0.02	A	8	0.02
SB, exiting Jay Peak Resort				C	17	0.43	C	17	0.43	E	41	0.83	E	41	0.83
2. VT 242 / Cross Rd															
EB, along VT 242	A	7	0.01	A	7	0.02	A	7	0.02	A	7	0.02	A	7	0.02
WB, along VT 242	A	8	0.00	A	8	0.01	A	8	0.01	A	9	0.01	A	9	0.01
NB, along Cross Rd	B	12	0.06	B	14	0.10	B	14	0.10	C	17	0.14	C	17	0.14
SB, along Cross Rd	A	10	0.03	B	10	0.04	B	10	0.04	B	11	0.05	B	11	0.05
3. VT 101 / VT 242															
EB, Exiting VT 242	B	12	0.41	B	14	0.56	B	14	0.56	C	19	0.71	C	19	0.71
NB, along VT 101	A	7	0.03	A	7	0.04	A	7	0.04	A	7	0.04	A	7	0.04
4A. VT 101 / VT 101 (North)															
EB, along S Pleasant St	B	13	0.08	C	15	0.10	C	15	0.10	C	18	0.13	C	18	0.13
WB, along S Pleasant St	A	10	0.15	B	10	0.18	B	10	0.18	B	11	0.20	B	11	0.20
NB, along VT 101	A	7	0.03	A	7	0.03	A	7	0.03	A	8	0.03	A	8	0.03
SB, along VT 101	A	8	0.09	A	8	0.13	A	8	0.13	A	8	0.16	A	8	0.16
4B. VT 101 / VT 101 (South)															
EB, along VT 100	A	8	0.05	A	8	0.05	A	8	0.05	A	8	0.05	A	8	0.05
SB, exiting VT 101	A	9	0.05	B	10	0.11	B	10	0.11	B	11	0.17	B	11	0.17
4C. VT 101 / VT 101 (East)															
SB, Exiting S Pleasant St	B	12	0.23	B	13	0.32	B	13	0.32	B	15	0.41	B	15	0.41
5. VT 243 / Elm St and Dominion Ave															
EB, exiting Elm St	A	9	0.05	A	10	0.10	A	10	0.10	A	10	0.14	A	10	0.14
WB, exiting Dominion Ave	A	9	0.02	A	9	0.02	A	9	0.02	A	9	0.02	A	9	0.02
NB, along VT 243	A	7	0.01	A	7	0.01	A	7	0.01	A	7	0.01	A	7	0.01

Note: N/A is shown for future scenarios for Jay Access Road because the majority of future traffic will pass through the intersection of VT 242/New Jay Access Road.

The congestion analysis results indicate that the following study intersection is expected to deteriorate to unacceptable levels during the peak hour for the 2024 No Build and Build scenarios:

VT 242/New Jay Access Road

Traffic exiting Jay Peak Resort is projected to encounter LOS E conditions attempting to turn onto VT 242 in the year 2024. Reconfigured access at Jay Peak is included in all scenarios with the exception of existing conditions (2014 No Build). A new access road will be built to accompany Jay Peak's continued expansion, located approximately 1,000 feet northeast of the existing Jay Peak Access Road (Stoney Path Road). According to the *Jay Peak Resort Expansion* (Jay Peak Resort, 2012), this intersection will become the primary access point for the Resort, while Stoney Path Road will offer secondary access.

This study recognized that LOS E conditions would occur during peak ski conditions for southbound-left movements, but that this condition would not occur on a daily basis and that the intersection would otherwise operate at an acceptable LOS.[7] It also stated that traffic monitoring and data collection would be conducted to manage any traffic operations issues that may arise, and that appropriate measures would be pursued by Jay Peak Resort as mitigation. Because the Resort has assumed responsibility for maintaining acceptable operations at this future intersection, this Plan will not evaluate any potential improvements.

[7] A signal was warranted at this location, but only during relatively rare occasions (i.e., peak Saturday afternoons during big ski weekends in the winter). Rather than installing a signal that would be unnecessary during most days of the year, Jay Peak offered to assist intersection operations manually with on-the-ground traffic assistance during these rare peak conditions.

APPENDIX A: LOCAL CONCERNS MEETING MATERIALS

PUBLIC MEETING

Northeast Kingdom **Transportation Infrastructure Plan**

6:00PM

at Gateway Center in Newport
84 Fyfe Drive, Newport, Vermont

Thursday
August 22, 2013

Come join us for an **open house and brief presentation** to learn about the Northeast Kingdom Transportation Infrastructure Plan and the EB-5 Program's anticipated impact on transportation conditions in the region.

We look forward to your input regarding transportation challenges in Newport, Derby, and Jay.

For more information, contact:
Doug Morton, Senior Transportation Planner, NVDA • (802) 748-1221 • morton@nvda.net

NVDA Northeastern Vermont Development Association

Town of Derby

RSG INC. RESOURCE SYSTEMS GROUP, INC.

Northeast Kingdom
Transportation Infrastructure Study
Newport/Derby and Jay Study Areas

Project Goal: ensure that the transportation system can support EB-5 and future growth sustainably and in a manner consistent with the region's vision for the future.

Project Status: fact-finding and Steering Committee input brought to light relevant issues/concerns.

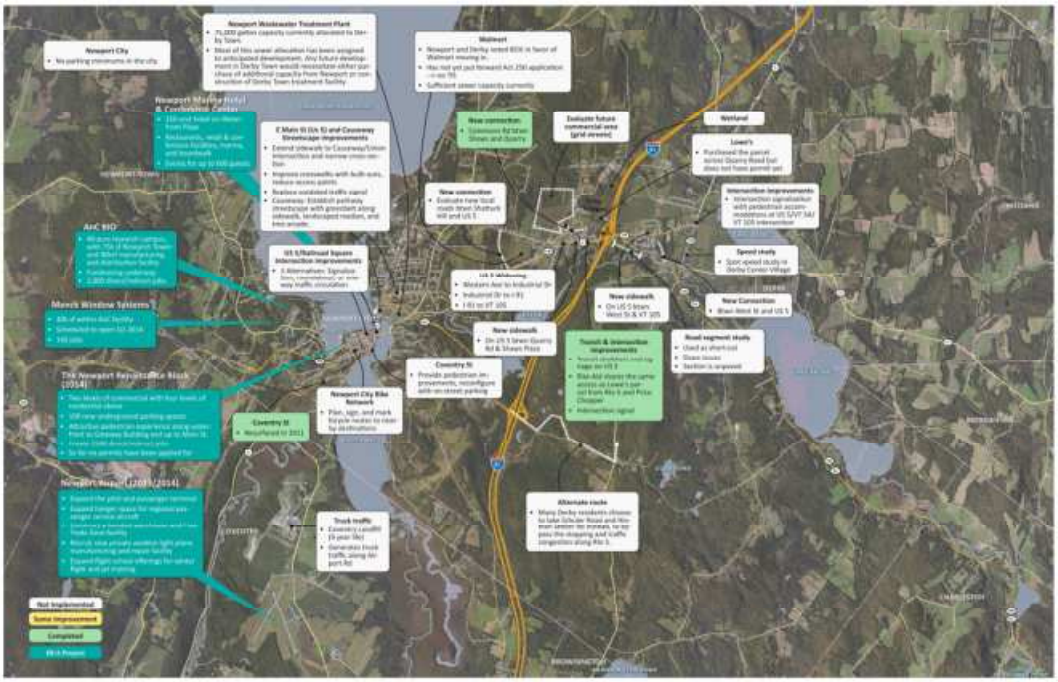
Tonight's Objective: solicit input from you regarding existing transportation challenges and your concerns about future development.

Next Step: evaluate impact of future planned growth on transportation network and recommend solutions to address impacts

Northeast Kingdom
Transportation Infrastructure Study
Newport/Derby and Jay Study Areas

Existing Conditions Study Highlights:

- Accidents consist mainly of rear-ends and left-turn broadsides; on VT 242 the main contributing factor to accidents is "driving too fast for conditions"
- There is a robust regional bicycle network
- Varied RCT services and privately-operated ski resort shuttles
- Congestion analysis indicated that the worst delays are found at the intersection of Main Street/Causeway/Railroad Square in Newport

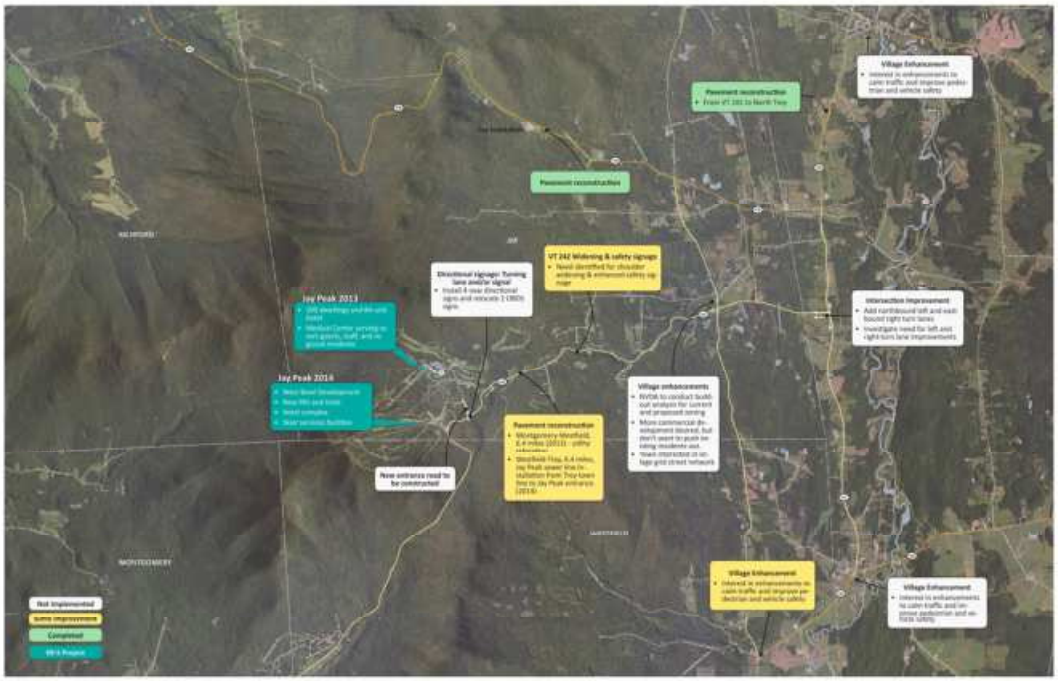


RSG

0 0.5 1 2 Miles

Newport/Derby Study Area

New Development and Transportation/Planning Recommendations.



RSG

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Jay Study Area

New Development and Transportation/Planning Recommendations.

MEETING SIGN-IN SHEET

Project:	NEK Trans Infrastructure Study Existing Conditions	**Meeting Date:**	08/22/13
Facilitator:	Doug Morton	**Place/Room:**	Gateway Center Newport City

Name	Town/Organization	Phone	E-Mail
Beth Barnes	Newport Resident	562 413 3583	gotwaves1@gmail.com
Pam Laddds	" "	802.334.7498	laddspam@gmail
Woodman Page	Newport Resident	802 334-6988	
Anne Page	Newport "	802-334-6988	
Dave Snedeker	NVDA	748-8303	dsnedeker@nvda.net
Michael Marcotte	State Rep	334-6302	mmarcotte@leg.state.vt.us
Sandy Thorpe	RCT	748-8170 x 401	sandy.thorpe@gmail.com
Matthew Langham	VTrans	802 828 5578	matthew.langham@state.vt.us
Robin Smith	Orleans County Record	you have it	
Steven Mason	NEKTI Consulting	744-6600	steve@kingdomcommons.com
Patricia Sears	Newport City Renaissance	323 1056	patricia.sears@discovernewportvt.com
Paul Sicard	JP Sicard Inc	525-9506	PaulC@JPSicard.com
Tom Livermore	Newport		Tom Livermore54@yahoo.com

PUBLIC MEETING

Northeast Kingdom **Transportation Infrastructure Plan**

6:00PM

at Lyndonville Public Safety Building
316 Main Street, Lyndonville, Vermont

Thursday
August 28, 2013

Come join us for an **open house and brief presentation** to learn about the Northeast Kingdom Transportation Infrastructure Plan and the EB-5 Program's anticipated impact on transportation conditions in the region.

We look forward to your input regarding transportation challenges in Lyndon and Burke.

***Light refreshments will be provided!**

For more information, contact:
Doug Morton, Senior Transportation Planner, NVDA • (802) 748-1221 • morton@nvda.net

NVDA Northeastern Vermont Development Association

Town of Lyndon Vermont

Town of Burke Vermont

RSG Inc. Resource Systems Group, Inc.

Northeast Kingdom
Transportation Infrastructure Study
Lyndon/Burke Study Area

Project Goal: ensure that the transportation system can support EB-5 and future growth sustainably and in a manner consistent with the region's vision for the future.

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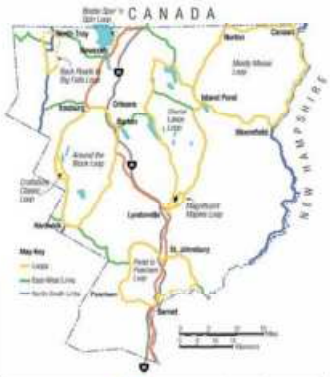
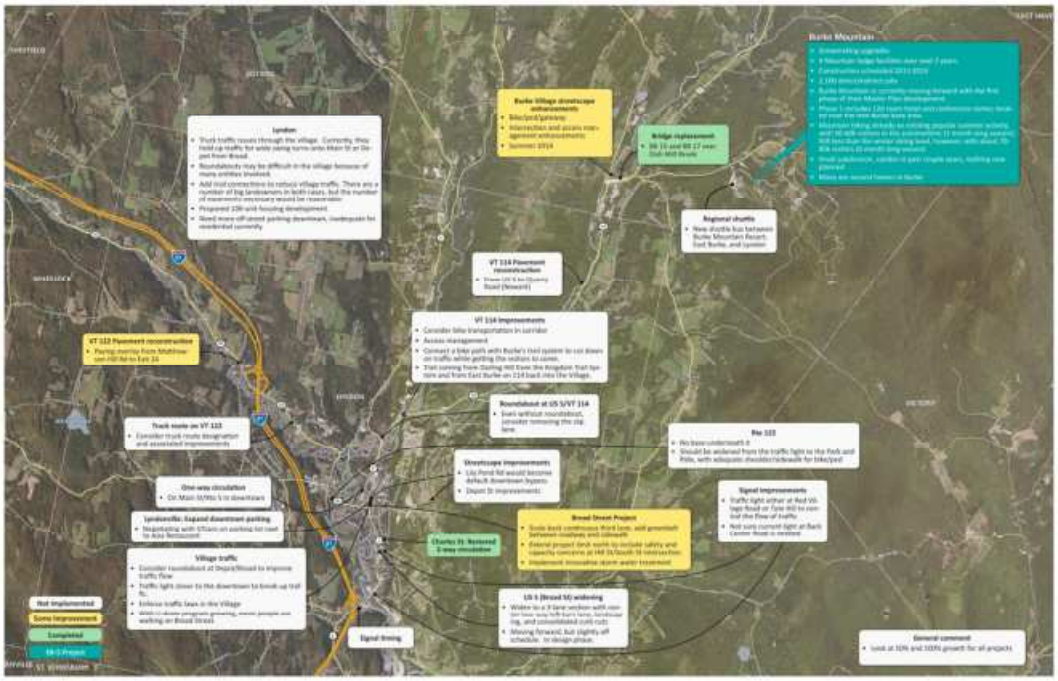
Northeast Kingdom
Transportation Infrastructure Study
Lyndon/Burke Study Area



Existing Conditions Study Highlights:

- Accidents consist mainly of rear-ends and left-turn broadsides and generally occur in commercial areas where there are a large number of driveways and side streets with no traffic control
- There is a robust regional bicycle network
- Varied RCT services and privately-operated ski resort shuttles
- Congestion analysis indicated that the worst delays are found at the intersection of Depot Street/Broad Street in Lyndonville



RSG INC

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Lyndon/Burke Study Area

New Development and Transportation/Planning Recommendations

Northeast Kingdom **Transportation Infrastructure Plan**

SIGN IN SHEET

NAME	ORGANIZATION	E-MAIL (for project updates)
Justin Smith	Town of Lyndon/Village of Lyndonville	Lyndzoning@kingcon.com
Marty Feltus	Lyndon - State	marty.feltus@gmail
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NVDA

TOWN OF BURKE VERMONT

RSG