

DRAFT REPORT FOR PUBLIC REVIEW: VOLUME 2

Lyndon Area Corridor Management Plan



Prepared for:
Northeast Vermont Development Association

Prepared by:
Smart Mobility, Inc.

With assistance from:
Oman Analytics
Kathleen Ryan, Landscape Architect

18 September 2008

TABLE OF CONTENTS

Existing Conditions- Lyndon Area Corridor Management Plan.....	1
Future Trends for the Lyndon Area Corridors	26
Traffic Growth.....	26
Public Transit	28
Bicycling	28
Burke Mountain Ski Resort Upgrade and Expansion.....	28
Build Out Analysis.....	30
Vision, Strategies and Recommendations for the Lyndon Area Corridor Management Plan.....	41
Addendum.....	65
Build-out Analysis: Methodology.....	65

LYNDON AREA CORRIDOR MANAGEMENT PLAN: Volume 2

Existing Conditions- Lyndon Area Corridor Management Plan

This memorandum summarizes the inventory of existing conditions related to transportation, traffic and land use for the major transportation corridors in Lyndon, Vermont. This is the first product of the Lyndon Area Corridor Management Plan process, which is to be completed by the end of September, 2008. This initial report relies in large part on a previous effort to document the conditions of the transportation infrastructure, the *Burke Mountain Area Transportation Infrastructure Study*, prepared for NVDA by Resource Systems Group, September 2007, which is hereby referred to as the “Phase 1” report. This memorandum summarizes the consultants’ findings based on additional field observations, data collection, and input from the steering committee, to provide a more comprehensive picture of how the corridor is functioning for the community. Subsequent phases of this corridor management planning effort will focus on future conditions, with traffic forecasts including the projected growth at Burke Mountain; and development of strategies to address the needs of the corridor in the face of this projected growth.

The Goals of the Lyndon Area Corridor Management Plan are to:

- 1) Develop a plan with strategies that will prevent problems such as traffic congestion that is currently an issue on Broad Street.
- 2) Identify affordable, short term improvements in spot locations for early implementation that will address safety or circulation issues.
- 3) Develop a conceptual growth strategy for the corridor, in regards to potential secondary growth that may arise from Burke Mountain’s expansions.

The goal of this first memorandum is to put the data collected in the previous stage into perspective, and assess its significance for the remaining effort to develop a corridor management plan. This will be helpful in later stages of prioritizing actions and potential improvements. In addition, this memorandum includes several topics that were not addressed in the phase 1 report, including the pedestrian environment, and a more quantitative review of the town’s zoning in preparation for a build out analysis.

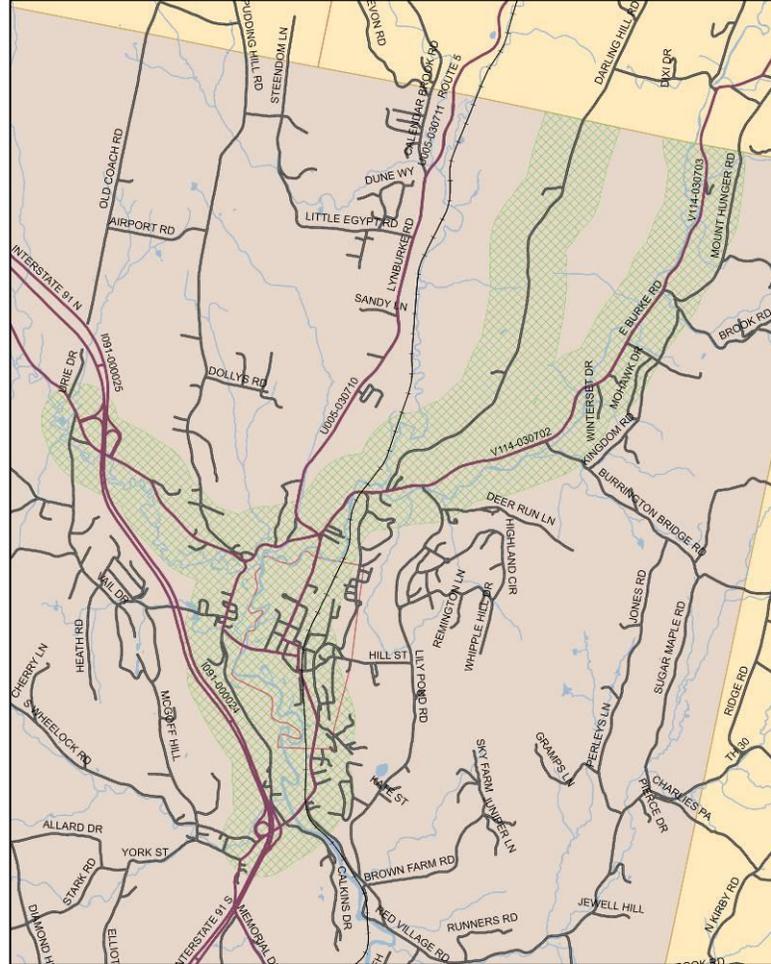
Boundaries of the Corridor Management Plan

The study area is shown on the map to the right, which is essentially a quarter mile buffer along the following corridors: US 5 between I-91 Exit 23 and Route 114, Route 122 between Lyndonville and I-91 Exit 24, and Route 114 from US 5 to the Burke Town Line. In addition, several connecting local streets are included: Back Center Road, Center Street, and Darling Hill Road.

While the map to the right shows the physical limits of the corridor management plan, the traffic growth forecasts will include growth within the “traffic shed” of this area, including the planned Burke Mountain four season development.

Existing Conditions

The *Phase 1* report (*Burke Mountain Area Infrastructure Study*) contains an extensive review of traffic data as well as an assessment of the zoning policies of Lyndon and Burke. This current effort will build on the *Phase 1* effort and avoid duplication. The following sections provide discussion of selected topics that either were not covered in sufficient detail, or in a few cases, where we have arrived at different conclusions than the authors of the *Phase 1* document.



Operational Conditions of the Transportation Network

The *Phase 1* report focused on the infrastructure conditions, and in this section, we will delve more into how this impacts, benefits, or hinders the functioning of the social and civic life of the community, the local economy, safety and other important considerations. Some infrastructure elements may be judged as “deficient” by a technical analysis, but it is important to also consider whether that deficiency creates a genuine problem in the community. Similarly, some features of the community’s transportation infrastructure may be problematic, but not show up in a conventional traffic analysis.

Traffic Congestion

Traffic congestion appears to be a major motivating force behind several of the more important recommendations advanced in the *Phase 1* report. This report included traffic analyses which concluded that several locations in the corridor area experienced moderate to severe traffic congestion. We have conducted field observations and reviewed data, and have refined the assessment of traffic congestion.

Broad Street/Depot Street Intersection

This intersection has high peak hour volumes and experiences congestion during the peak hours. The *Phase 1* study concluded, based solely on a technical level of service analysis, that there were extreme delays for westbound traffic on Depot Street as they attempt to turn south on Broad Street. The unconventional geometry of this intersection makes it unsuitable for analysis using the typical traffic analysis methods. To better understand the actual traffic conditions at this intersection, we conducted onsite field observations and data collection, which indicated far lower delays than the analysis from the *Phase 1* report. We supplemented these observations with a more refined analysis using a simulation model (SimTraffic), which also showed much lower delays at this intersection. A comparison of these analyses is shown below:

Delays for Depot Street/Broad Street Westbound Left Turns

Source	Average Delay per Vehicle (WB left turns)
Phase I Study (2007 Existing)*	> 5,000 seconds per vehicle (over one hour)
Field Observations (SMI 05/8/08 PM peak hour)	20 seconds per vehicle
SimTraffic Analysis (2008 PM Peak Traffic volumes)	< 13 seconds per vehicle

* page 163 of 172 (pdf file), *Burke Mountain Area Transportation Infrastructure Study Appendices*

The *Phase 1* study and recommendations seem to be based on the perception that there are extraordinary delays for Depot Street traffic. Our observations indicate that, while there are some delays for traffic exiting Depot Street eastbound, they are by no means unreasonable for a peak hour condition. The amount of congestion at this intersection is overstated in the *Phase 1* report and may not warrant some of the more costly or disruptive traffic solutions recommended in that report. It is up to the Lyndon community to decide whether or not the level of congestion at this intersection is acceptable or if improvements are needed. Based on a more refined analysis and field observations that we have conducted, they do not appear to be warranted at this time based on vehicle delay.

Broad Street Corridor

Our observations concluded that Broad Street is the most severely congested portion of the study area, besides the center of Lyndonville. The traffic concerns are described in more detail in the VTrans Scoping Report. The congestion along this corridor is also less easy to analyze or define using conventional traffic analysis methods, as much of the congestion is caused by left turns into individual driveways, rather than at street intersections. While each individual driveway may not show congestion, in the aggregate, the numerous, closely spaced driveways result in a sometimes chaotic, congested operation when high volumes of through traffic conflict with the turning traffic. This congestion impedes movement along the entire corridor, which is a critical link between I-91 and a number of communities beyond Lyndon. It can also result in more frequent crashes such as rear-end collisions, or drivers attempting to turn out from a driveway onto Broad Street with an insufficient gap in traffic.

In addition to the general improvements along the length of this street, specific locations along Broad Street that are currently under design for improvements include the Tute Hill/Charles St intersection and the Red Village Road intersection.

The VTrans project appears to be stalled due to lack of funding, which is affecting projects throughout the state. There may be opportunities within this corridor management plan to suggest modifications to the proposed design that may reduce costs and target improvements to the most critical locations.

Rural Corridor Level of Service

The *Phase 1* report also concluded that long sections of two lane open road in the rural portions of the corridor experience level of service D or E conditions. It should be noted that this analysis does not reflect the total capacity of the road, but rather reflects conditions during the peak hour, in which many drivers are not able to drive their desired free flow speed, but rather are more often in a line of traffic, traveling at a slower speed than they would desire. This does not at all reflect that these roads are “over capacity”, and given that these conditions only persist during peak hours, this analysis may not reflect a transportation problem that warrants costly improvements. Generally, the only solutions to this type of condition are very expensive such as constructing passing lanes or road widening.

Design Hour Designation

The previous study conducted traffic analyses for Saturday peak hours, as they had concluded that it was the most critical period for Burke Mountain ski traffic. However, our review of the data indicates that the weekday peak hour traffic substantially exceeds Saturday peak hour traffic with or without additional Burke Mountain traffic. Therefore, we recommend that the weekday peak hour also be considered for traffic impact analyses and project design, and not just the Saturday peak hours.

Truck Traffic

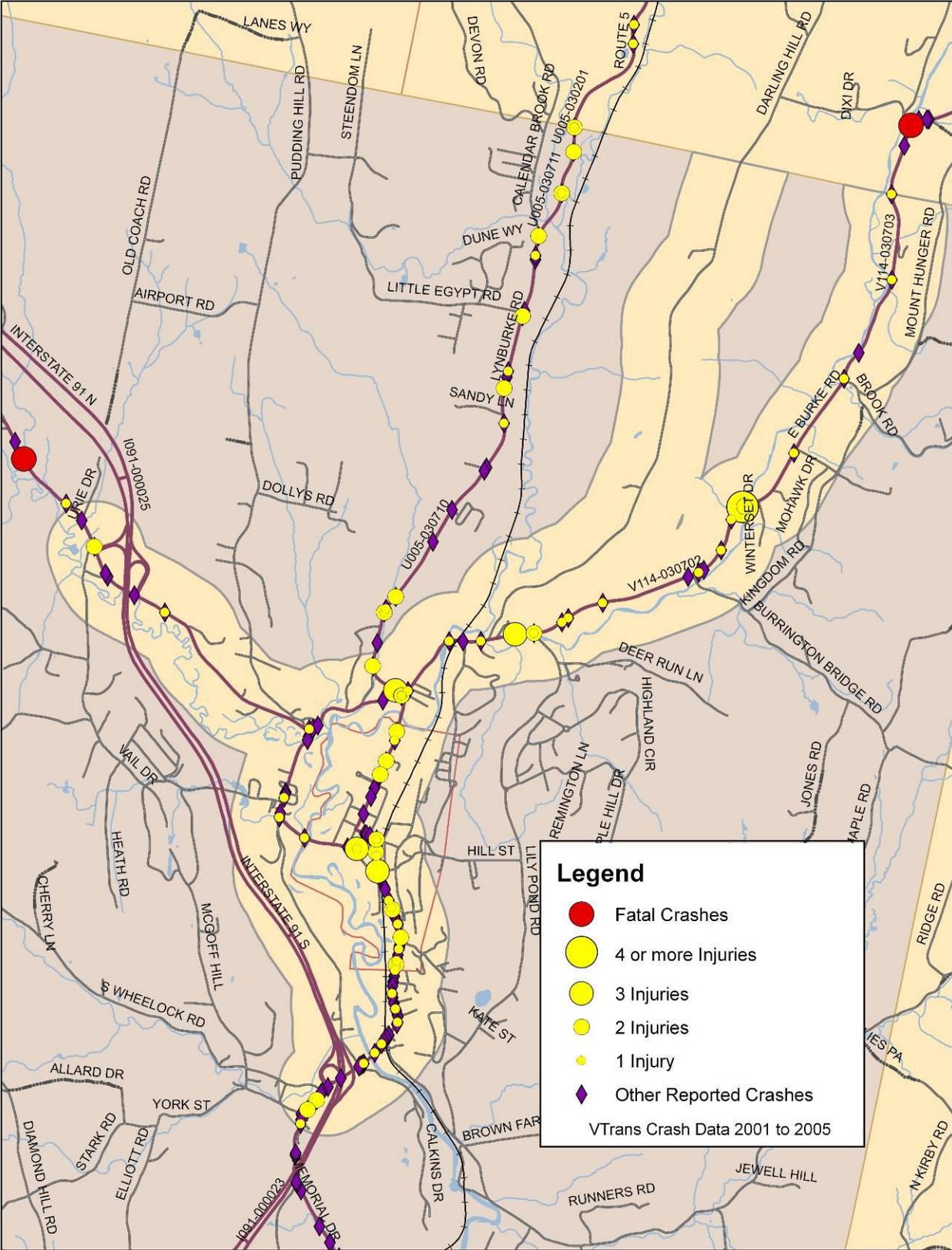
In addition to examining the percentage of truck traffic on the roads in the corridor area, the total number of trucks should also be considered as this is more related to impacts such as noise and road impacts. The following table shows the six VTrans vehicle classification stations within the corridor area, and shows the total number of trucks per day, broken down by “medium” (single unit) and “heavy” (tractor trailer) trucks.

Route	Location	Total Daily Trucks	Daily Mediums	Daily Heavies
US5	Broad Street just N of Tute Hill Rd	1,386	1,172	215
US5	S of Center Back Rd (at I-91 Interchange)	1,040	608	432
US5	S of Hemlock Lane (no. of downtown)	590	414	177
VT114	0.5 mi S of Burrington Bridge Rd	267	154	113
VT122	0.4 mi E of I-91	177	126	52
VT122	0.1 mi N of Red Brick Rd	157	111	46

Route 5 south of Lyndon has the highest trucks by number, which of course is not surprising as this portion of the corridor tends to collect regional traffic to and from the interstate, and also serves ample industrial areas.

Highway Safety

The *Phase 1* report conducted an analysis of traffic accidents, and concluded that there are a number of high crash segments within the corridor area, including segments of Broad Street, Center Street, and Route 114 (see Figure 7, *Burke Mountain Area Transportation Infrastructure Study*). This report also considered the time of day of the crashes, as well as the day of the week. It is also helpful to look at locations where injuries and fatalities have occurred. The following map shows the accidents with injuries and fatalities highlighted, for the most recent period available, 2001 through 2005.



The map on the previous page shows that there were no fatal accidents during the period of 2001 through 2005 within the study corridor, although there have been more recent fatal crashes. The following locations appear to have a history of crashes that result in injuries and may warrant further consideration.

Broad Street: Crashes along this portion of the corridor are fairly well distributed, indicating that there is not a single feature or intersection that is more problematic. However, the overall number of crashes and injuries is significant.

Downtown Lyndonville: Several intersections, including Broad/South (4 crashes), Broad/Depot (6 crashes), Broad/Center (7 crashes) and South/Center (3 crashes), have high proportions of accidents resulting in injuries. Our field observations were inconclusive as to features that may result in elevated crashes, although we noted that the very wide street widths result in through traffic passing left turning traffic, possibly resulting in collisions. Local input on the safety of these locations would be helpful.

North Main Street: Crashes along this section appear to be more related to the frequency of access and turning movements, rather than to any geometric features of the road. This section may be a good candidate for implementing access management policies via land use policies, as there is likely to be growth pressure as Burke Mountain expands.

Route 114: Several locations along Route 114 are noted to have high crashes, but the two most severe locations are the intersection with Route 5, and at the Passumpsic Bridge at mile marker 2.1, near Winterset Drive. Both of these locations have seen important improvements – the new signal at Route 114/US 5, and the widened bridge. An additional location that warrants consideration based on injury data is the Lily Pond Road intersection, which has seen five crashes resulting in eight injuries during the period 2001 through 2005.

Bicycle Transportation

Bicycle transportation will generally only have a limited role in Vermont for meeting day-to-day transportation needs, but even with the limits of topography and weather, establishing safe, comfortable bicycle conditions on the areas road network can provide an alternative for the local trips within Lyndon, between Lyndonville, Lyndon Center, Lyndon State College, and other destinations. With local input, a viable bicycle network could be established on existing local streets which offer reasonably safe and convenient bicycling. This network could connect the primary village centers in Lyndon, as well as East Burke.

The region has enormous potential for recreational cycling, with the outstanding scenery and interesting, appealing village centers. The popularity of recreational bicycling, both on paved roads and back roads, has already shown the promise of drawing people to the region. Kingdom Trails and the Back Roads Bicycling Guide are outstanding local resources for recreational bicycling. As Burke Mountain expands its operation to four seasons, bicycling between Burke and Lyndonville could be a benefit both to the resort and the town, as it will allow visitors to patronize Lyndonville without requiring a parking space, for example.

Pedestrian Transportation

The existing sidewalk system serves downtown Lyndonville and most of the surrounding neighborhoods. One sidewalk on the north side of Center Street extends over the bridge and links Lyndonville to Lyndon Center and the Institute.

The important stretch of Broad Street south of Hill Street is not served by sidewalks.

Downtown sidewalks are generally in good condition but gaps or barriers exist in some locations. There have been efforts to introduce street trees to enhance the Depot Street block.

Observations

The Depot/Broad Street/Angie's Alley intersection is a confusing pedestrian crossing. The wide street, the parking area within the Depot Street ROW and the Railroad crossing, combine to make the Depot St crossing uncertain and weaken the pedestrian link between downtown and neighborhoods to the east.



Depot, Broad Street, Angie's Alley, Railroad Street intersection



Wide Elm Street sidewalk serves pedestrians well



Broad Street to Main St sidewalk link blocked



The removal of greenbelts on Church St to provide diagonal parking has diminished the appearance of the street and the functionality of the pedestrian way



The sidewalk on the east side of Broad Street ends at the bus stop



The mid-block crossing on the wide North-South block of Broad Street is challenging for pedestrians. Neighborhood sidewalks vary but most are concrete and in good condition. Sidewalk widths vary and some are asphalt. In some locations greenbelts have been removed to provide angled parking without a curb added to separate parking from the sidewalk. As a result, it was noted that vehicles park on the sidewalk, blocking the pedestrian way.



Charles Street



Raymond Street

Broad Street sidewalks end below the South Street/Hill Street intersection. There are potential pedestrian destinations on Broad Street including the Kinney Drug store and White Market at the south end of the street; a walkable distance of about one mile. There are restaurants and other commercial Broad Street uses within shorter walking distances. Roadway shoulders, while not always safe, are sometimes used by pedestrians. It was noted that there are no “desire lines” or trodden paths along Broad Street green belts and lawn indicating that pedestrians use the route despite the lack of facilities. The shoulder of Broad Street is an inconsistent width making it less attractive as a pedestrian route.

Town staff has indicated that the Broad Street right-of-way is four rods or 66 feet in width.



Narrow dusty Broad Street shoulder is unsafe for pedestrians

Parking

Parking is a critical resource in American towns and cities. It is the means by which a driver is transformed into a shopper, client, visitor, or citizen--the life blood of a community. Despite its importance, parking should be considered a subsidiary use. Its role is to serve the core community functions of commerce, and social and civic life.

Parking consumes enormous amounts of the most valuable town center space. Unless it is well managed, it can come to dominate the streetscape, and even crowd out the critical uses it is intended to serve. It can transform a community center from a vital asset to a barren wasteland, inhospitable to the people it serves.

Parking is one of those features of a village downtown that is often thought of as never having enough. This is often an inaccurate perception. Because of the high cost in terms of space and even direct costs to build and maintain parking, "right sizing" the total parking resource is of major benefit for any downtown.

This is doubly true in terms of the quality of the downtown for shopper, client, and citizen visits and participation. While excessively tight parking can indeed be a deterrent to downtown shopping and other activities, excessive parking can create a barren, almost abandoned feel, and further increase walking distances that make downtown participation unpleasant and undesirable. In fact, slightly tight parking creates a feel of vitality and activity that can actually enhance downtown participation.

As a result, current thinking is that city, town, and village core areas should strive to achieve about 85% parking occupancy throughout the day. This number has been found to make maximum use of the available resource and yet, with 15% of spaces unoccupied, no one who wants to park will ever be unable to find a space. In an area as small as downtown Lyndonville village, parking will also be within short walking distance of any downtown destination.

Parking in Lyndonville

Despite its importance, parking in Lyndonville has never been systematically surveyed and studied, and it is not included in the work program for this study. Parking and the need for it have been cited as a crucial basis for not embracing some traffic enhancement approaches in the Village core. Some inferences, however, may be made.

Two data sources provide at least some insight into this critical parking issue:

- The previous corridor study inventoried existing parking in the Village core and identified it by public/private ownership.
- Aerial ortho-photography exists at sufficient resolution to accurately assess actual parking occupancy at the time at which the photos were taken. Based on the aerial photography, it has also been possible to further delineate parking by its location on- or off-street and to locate it by which street it is on or from which it obtains its primary access.

The following table shows the inventory of village parking, located by street, and identified by public vs. private control, and on- vs. off-street location. In general, on-street locations are usually perceived as more

desirable and/or convenient by shoppers and other downtown visitors, due to their high visibility and easy access.

The table below shows the actual percent occupancy in each of these areas, and the map on the following page indicates the location of occupancy categories by specific location. (The occupancy categories mapped are: >85%: effectively full, 50% - 85%: reasonably well used, and <50%: effectively empty).

Inventory of Parking Spaces in Lyndonville Village Core Area

Pub/Priv	LOC	Broad	Center	Church	Depot	Elm	Main	Maple	Middle	Total
Private	Off-St		18	60	64	24	85			251
	On- St	10								10
	SubTot	10	18	60	64	24	85	0	0	261
Public	Off- St				16					16
	On- St	33	3	26	74	31	27	25	16	235
	SubTot	33	3	26	90	31	27	25	16	251
	Total	43	21	86	154	55	112	25	16	512

Percent Occupancy of Parking Spaces in Lyndonville Village Core Area

Pub/Priv	LOC	Broad	Center	Church	Depot	Elm	Main	Maple	Middle	Total
Private	Off- St		22%	32%	47%	58%	52%			44%
	On- St	50%								50%
	SubTot	50%	22%	32%	47%	58%	52%			44%
Public	Off- St				75%					75%
	On- St	36%	33%	46%	80%	39%	56%	32%	56%	54%
	SubTot	36%	33%	46%	79%	39%	56%	32%	56%	56%
	Total	40%	24%	36%	66%	47%	53%	32%	56%	50%

Observations from Parking Data

Several observations based on the data available may be made. It should be emphasized that this is not based on a formal survey/study. Average conditions may be somewhat different than the snapshot used to collect this data. However, the data found here do compare well with the observations of the consultant team over the course of several visits to the village area.

The overall occupancy is 50%. This is quite low and would indicate that overall parking supply related to demand is more than sufficient for the current mix of uses.

Highest area occupancy was found in the public spaces on and around Depot Street. Overall the small public "lot" at Broad and Depot had an occupancy of 75%, and Depot St as a whole had an occupancy of 80%. These are approaching the target of 85%, but still provide some vacant spaces for visitors to downtown.

The two highest individual groupings of spaces, one on the North side of Depot at Broad, and the other on the West side of Main at Depot, had occupancies of 86% and 87.5% respectively. These were the highest occupancies found anywhere in the downtown, and have just achieved the target of 85%.



Overall, it appears that Lyndonville village has a plentiful supply of parking in relation to its demand, and to support significant expansion of business and other downtown activity. A full, formal parking study including a formal survey should prove valuable in establishing more rigorously the dimensions of this parking situation.

Park and Ride Lots

There is a municipal park and ride lot in Lyndon Center, but no formal or designated park and ride lot near the Exit 23 Interchange. However, an informal location is currently being used on the Calkins Property.

Vermont is currently finding many of its park and ride lots at full capacity due to increasing fuel prices, so it is likely that park and use may increase in the future.

Scenic Character

While the scenic qualities of roadways are not generally considered a conventional “performance characteristic” of a rural roadway, the outstanding scenery on the Lyndon area roadways deserves consideration in this effort. All of the corridor roadways have a unique rural character, and Route 114 and Darling Hill Road have particularly outstanding scenic views. This scenic quality is an asset to the region and certainly has the effect of drawing visitors to Lyndon. As growth and road improvements are planned for the corridor area, the relationship to and impact on, this scenic character is worthy of consideration.

A short distance from the Village, most roads begin to develop a more rural scenic character. The rural roadways reveal elements of a Vermont agricultural landscape of open meadows and farm fields bordered by forest land and backgrounded by hills and mountains.



Route 114 – view north



Darling Hill Road -view south

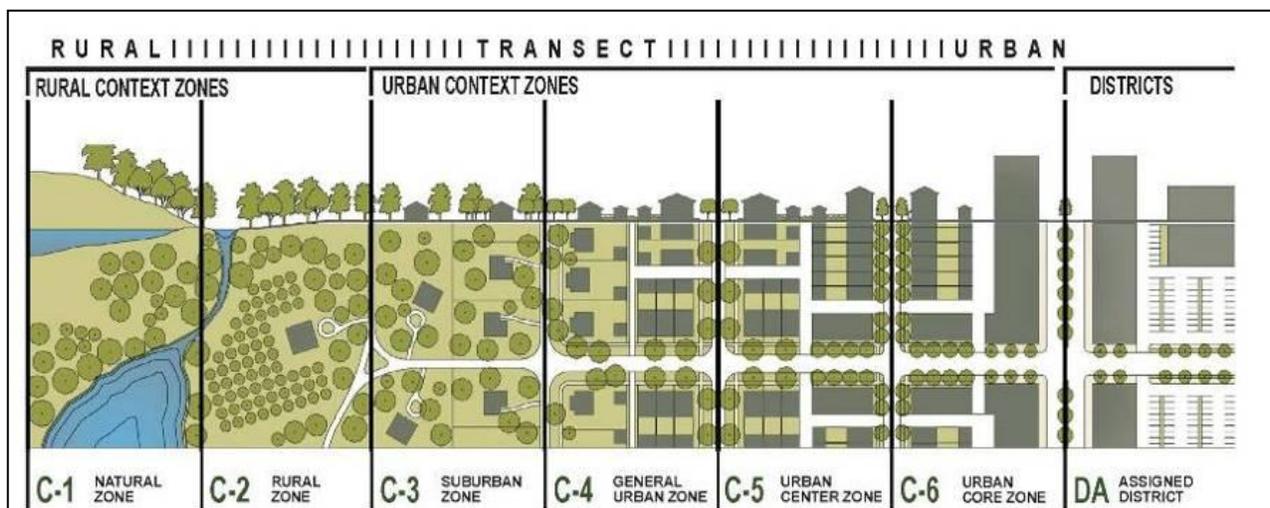
There are many scenic views along Route 114 between Lyndonville and Burke. Darling Hill Road reveals ridge-top views across the valley to both east and west. Elements of the built environment such as historic barns and homes add to the visual experience.

Land Uses

The following sections describe the land use context in more detail than in Phase 1. The next activity in this effort will be to conduct a build-out analysis to better understand future conditions and emerging opportunities for the corridor. To do this, we need to begin with a thorough and quantitative understanding of the local zoning ordinances, so that the build out analysis is consistent with the regulations. The discussion on the following pages describes the zoning policies as they will relate to the build out analysis. Following that is a discussion of the concept of “context zones”, which provide a more simplified and non-regulatory way to consider the different types of environments, or contexts, along the corridor, so that the strategies and tools that emerge from this project can be targeted to the appropriate types of area.

Context Zones

Using the concept of Context Zones, and adapting specifically to the Lyndon area, we can identify portions of the highway corridors with common characteristics, and therefore similar performance goals. The following figure illustrates the concept of “context zones” along a generic transect from the most rural areas to urban areas. While the Lyndon area corridor certainly does not contain highly urban areas, the transition that occurs between the rural lands lining Route 14 to downtown Lyndonville reflects a type of “rural to village” transect. The concept of context zones can be adapted to the corridor, and used to identify appropriate goals and strategies for different parts of the corridor. .



The following “context zones” are suggested for the Lyndon corridor area. These are non-regulatory, and therefore exact boundaries of these zones are not important; rather these are identified to describe how context varies tremendously throughout the corridor area. When we are considering how the roads should operate, and what the community’s goals for the performance of these corridors are, the context can be considered as one factor.

The following paragraphs describe the context zones as applied to the Town of Lyndon, and are somewhat translated to the categories as illustrated above.

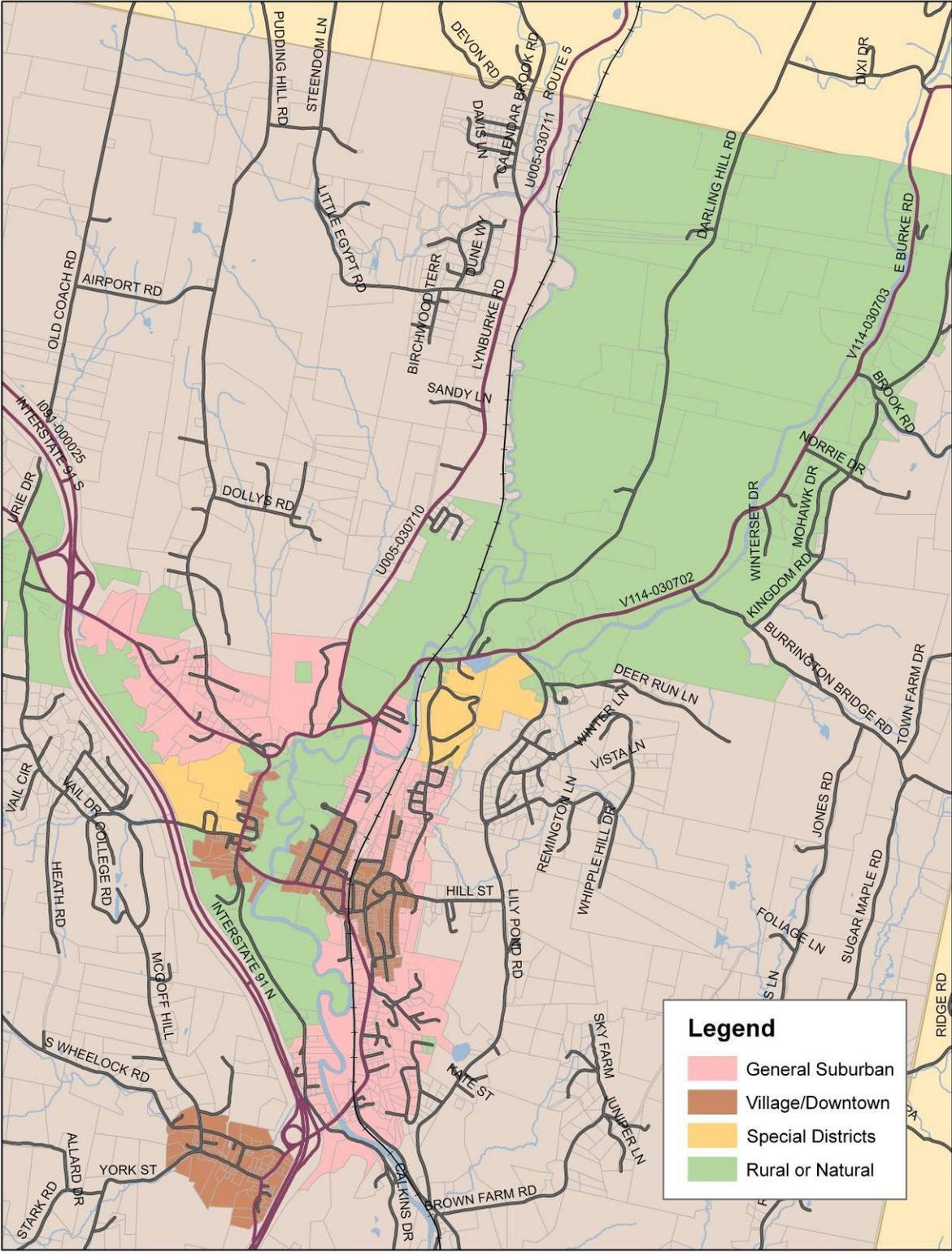
C-4: Village- Downtown Lyndonville is clearly a unique village setting, with more compact, traditional forms of development and much higher pedestrian activity. In addition, Lyndon Center has a similar compact form, as does East Burke and South Lyndon (south of I-91 Exit 23 interchange). Village centers are all about “exchange”, and all modes of transportation would tend to converge in these locations, sometimes creating some chaos, but with many benefits, social and economic, generated by this activity. Vehicle speeds should be slow through these areas to minimize conflicts with pedestrians, cars that are parking, and turning traffic.

C-3 General Suburban-The areas generally on the outskirts of Lyndonville have a more suburban character, reflecting their more recent construction. Suburban areas are generally designed with consideration to convenient automobile access, and therefore have a different character than the historic villages. This context describes both the Broad Street and North Main Street areas, which have seen more recent growth. While the primary type of access to these areas is by automobile, pedestrians often do need or want to access these areas, and should therefore have some level of safe facilities. These suburban context areas include both commercial and residential areas, as indicated both by the current uses and the zoning. For purposes of this corridor management plan, the study roadways only include commercial areas, while residential areas are located along lesser traveled rural roads and residential streets.

C-2: Rural-The remaining areas are generally rural, and are characterized by outstanding scenery, views of mountains and rivers, and other great assets to the region. These corridors also serve as an economic lifeline to the communities to the north, which are highly dependent on forest products industries, so logging and lumber trucks are common.

Districts-Several areas in the corridor have unique, special land uses. This would include the Caledonia Fairgrounds, Lyndon Institute, Lyndon State College, and Burke Mountain Ski Resort (although the latter two are outside the immediate study area). Districts tend to have unique transportation requirements which should be considered in the planning process. Special events at these locations are likely to create temporary traffic congestion, but may not warrant costly improvements since they are infrequent. Rural roads should generally provide for higher speed travel, and provide for at least a minimal degree of bicycle safety.

The map below shows a proposed context zone map, for review and comment. When reviewing this map, which is an initial draft, it is important to emphasize that this is not a regulatory scheme, but is intended to assist in defining appropriate goals for the corridor in the different types of areas that exist. The exact boundaries between zones are not important, as it is used as a tool to generally describe the different environments found in the study area.



Zoning

The major function of zoning is to establish location of uses, including use mix, and density standards for development throughout the municipality. The current Lyndon Zoning Ordinance was originally adopted in 1996 and was most recently updated in April, 2003.

Lyndon zoning is fairly typical of rural Vermont towns. In addition to the standard use and dimensional provisions, it incorporates site plan review and parking as well as a variety of specific measures (eg signs, earth removal, etc). These provisions are fairly standard/conventional in their approach.

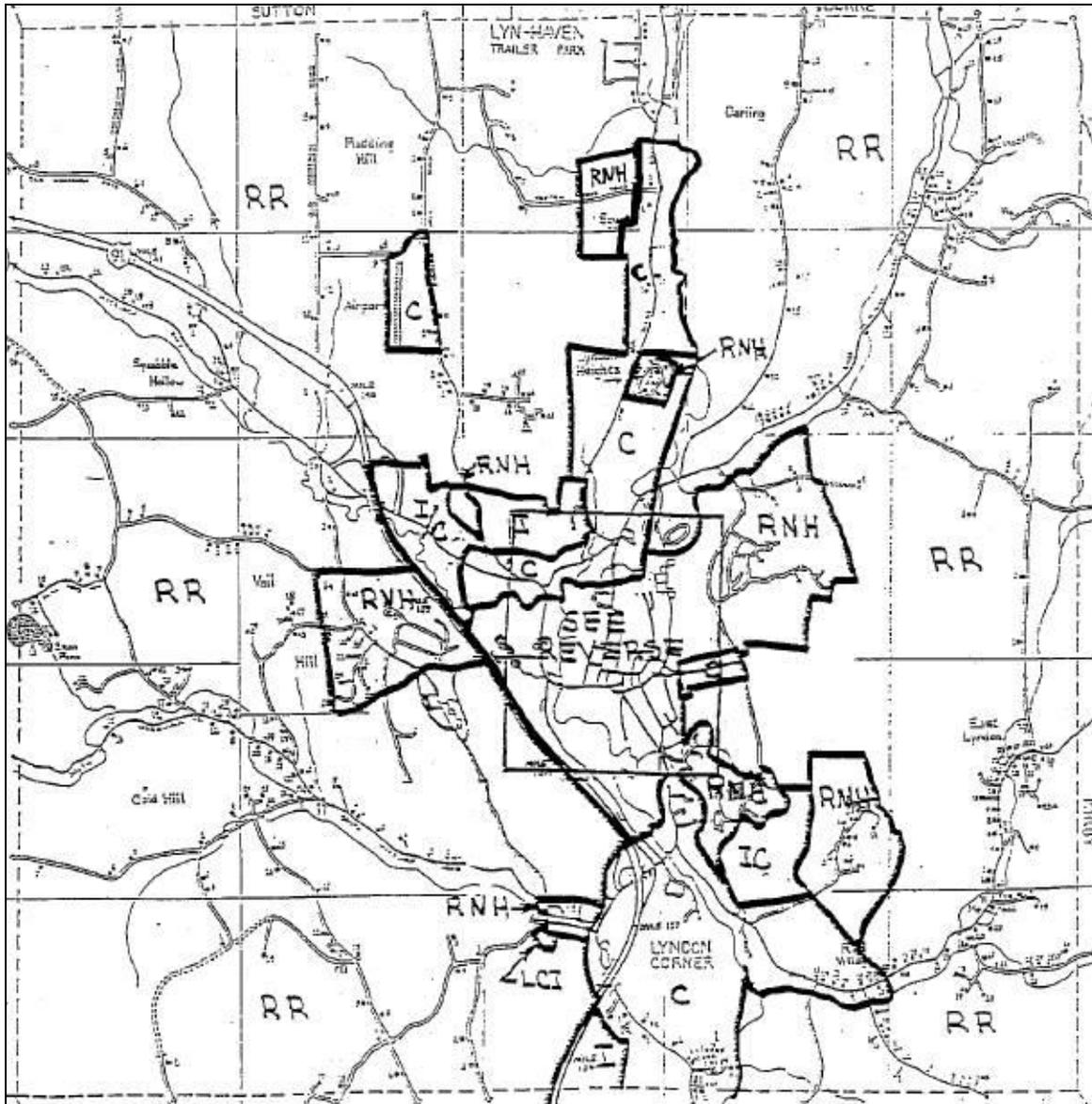
One aspect of the Lyndon zoning is a bit unusual and more like a "development control" ordinance in that it also incorporates subdivision standards, although these are fairly minimal in laying out detailed subdivision requirements, and could be interpreted to lay out no substantive requirements at all for "minor" subdivisions (into eight or fewer lots and not requiring Act 250 approval).

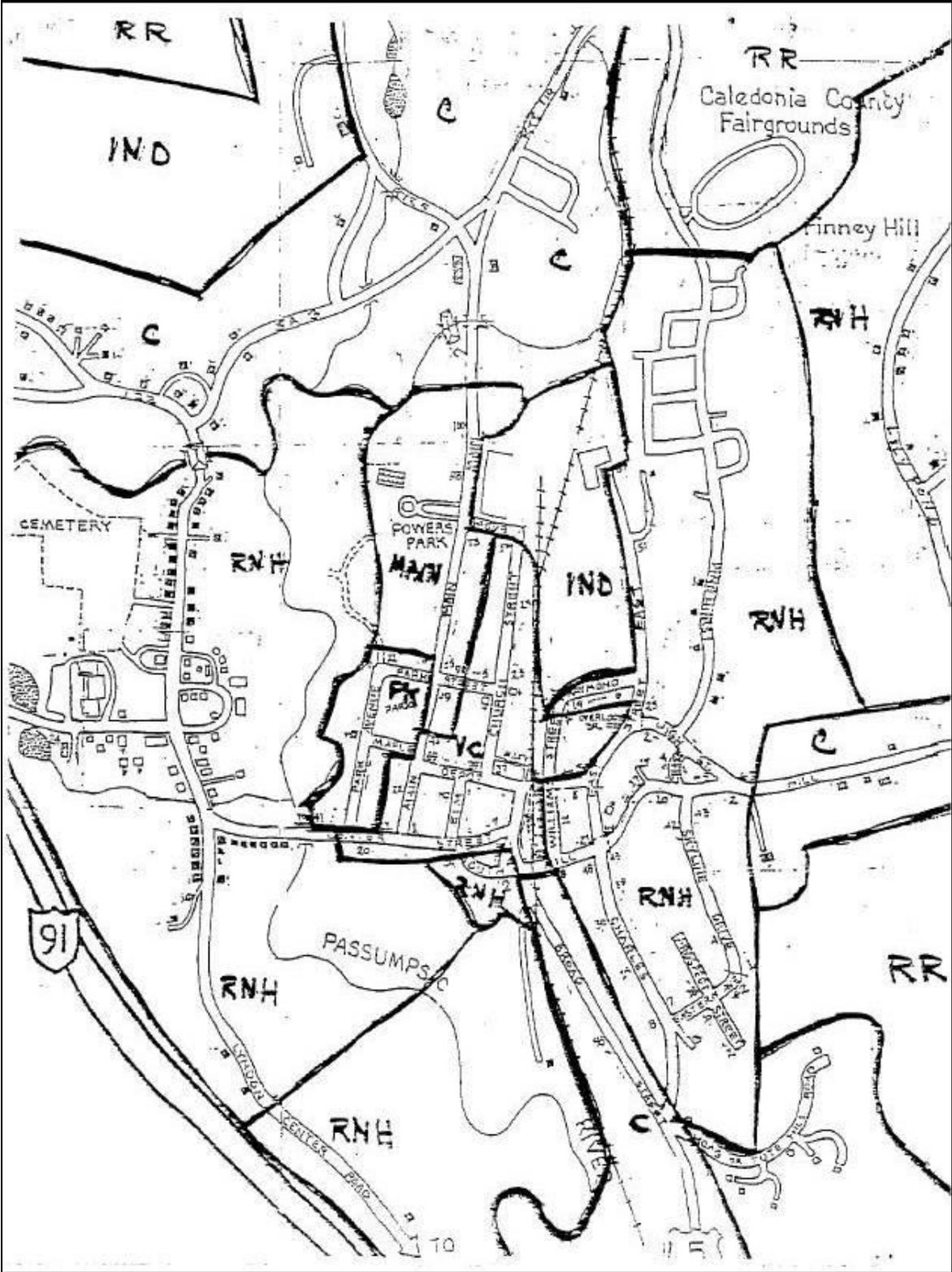
Zoning Districts in Corridor

The Burke Mountain access corridor contains portions of nearly all of the zoning districts defined under the Lyndon zoning ordinance, including:

- Rural Residential (RR)
- Commercial (C)
- Residential Neighborhood (RNH)
- Village Commercial (VC)
- Industrial (I)
- Industrial/Commercial (I/C) (@ exit 24)
- Main St (Main)
- Park (Pk)

The location of these districts is illustrated on Maps below.





(A more detailed and accurate map is currently under preparation that will permit the actual application of zoning requirements throughout the corridor on a parcel specific basis.)

Uses

In general, uses and use definitions appear to have entered the ordinance somewhat by accretion. There are significant overlaps, and some uses appear to be holdovers from earlier times and/or conditions. A few general observations:

- Except for "light industry" which is limited to 2,000 sf and not a major consideration for development that establishes either the character or economic base of the town, industrial development anywhere in town is a conditional use.
- Lodging uses have somewhat proliferated for which purpose is not apparent. These include:
 - transient lodging
 - guest house (no meals)
 - bed & breakfast (meals)
 - motel
 - there is no "hotel" or "inn" use which might provide for more in-town compatibility
- There is a modest proliferation of commercial uses, including "commercial", "retail store", "retail service", "personal services establishment", and "other commercial use" plus Main St versions of both "retail store" and "offices" that can lead to some confusion.
- Some uses are of questionable value and/or utility, including: "bulk storage of dangerous materials", and "junk yards"
- Although there is provision for PRD (effectively "cluster residential"), there is no provision for its mixed-use cousin, PUD
- The ordinance relies fairly heavily on catchall use (conditional) in RR, VC, C, I which consists of any use the Board finds compatible. Mostly these have no defined standards for this finding, although Park & Main do incorporate some limitations or notions of standards.

Uses in corridor zoning districts

Some of the specific characteristics of uses in corridor zoning districts are described here.

Rural Residential (RR)

This district encompasses most of VT114 north of the Village. As such, it is the most sensitive to development pressure resulting from Burke Mountain development and activities. Among the uses permitted in this district are:

- Permitted by right (no review required):
 - 1 & 2 family residential
 - B&B and guest houses
- Permitted as a conditional use (conditional use review required)
 - multi-family (mf) residential
 - light industry
 - planned residential development (PRD)
 - mobile home park
 - campground
 - medical clinic

In addition to the specific permitted uses in this district, the RR district includes a catchall conditional use: "3.1.2.19 Other uses upon the finding by the Board that such uses will not be detrimental to uses in the Rural Residential District or to adjoining land uses." The ordinance specifies no standards for this finding.

Because of the density requirements (see below), the mobile home park use represents uniquely serious impact potential.

Residential Neighborhood (RNH)

Uses in this district overall represent a reasonable in-town residential district. Unlike the RR district, RNH supports no catchall use. It provides for a mobile home park as a conditional use.

Village Commercial (VC)

The village commercial (VC) district is the primary town center zone. It supports many desirable features, including special parking and dimensional provisions. It supports a catchall commercial use with no specific standards for application. It also contains some possible incompatibilities that are either highly auto oriented and/or low density uses generally not supportive of town center vitality:

- car wash
- drive in restaurant
- fuel distribution
- motor vehicle repairs
- auto service station
- warehouse (except auxiliary to other retail/commercial)

Commercial (C)

The C district is the Town's major non-residential zone. It has largely been deployed as "strip" along significant roadways. It supports most commercial uses, including a commercial catchall similar to that discussed in other districts.

Industrial (I)

The I district generally supports a reasonable assortment of industrial uses with a couple of possible exceptions. It is unusual for communities to permit "junk yards", even by conditional use, and even if they are existing uses. An existing, non-conforming use may continue, and there is generally little reason to provide for significant expansion or new ones. Also, "bulk storage of dangerous materials" is a use of uncertain value and also violates separate performance standards.

Industrial/Commercial (I/C)

The I/C district encompasses the area in the vicinity of the I-91 Exit 24 interchange. By combining the permitted uses of two districts, this is basically a catchall district, permitting a very wide variety of activities. It is of particular concern because it abuts exit 24, and could therefore face development pressure.

In addition to the basic districts, there are two specialized village districts: the "Main St" (Main) district and the Park (Pk) district. In some ways, these act more like overlay districts, specifically defining character issues, although overlay districts often enough incorporate a level of specificity that is almost districts in themselves anyway. These two districts are largely built out and new development within them, while important from a community character point of view, will have little or no impact on corridor transportation issues.

A simplified table of the uses supported in the most important corridor districts is included below.

Uses in Corridor Districts

Zone\Use	single family	multi-family	Retail/ Commercial	Office	Industrial
Rural Residential	P	C			
Residential Neighborhood	P	C			
Commercial	P	C	P	P	
Village Commercial	C	C	P	P	
Main	P	C	P	P	
Park	P			C	
Industrial			C	P	C

P = permitted by right

C = conditional use

All uses not permitted or conditional are prohibited

Density and Dimensional Requirements

The Lyndon zoning density and dimensional requirements are established by the dimensional table: "Minimum Requirements for Development". In addition to standard requirements for minimum lot size, frontage, front, rear and side yard setbacks (including a required buffer for all uses from lot lines), and a maximum building coverage limitation, this table includes density factors based on the availability of Town sewer and water service. A slightly simplified version of this table is included here:

Minimum Requirements for Development

District	Class	Min Lot (sf)	mf/du (sf)	Frontage	Setbacks			Buffer	Max % cover
					front	rear	side		
Rural Residential	1	20,000	15,000	100	40	25	25	10	20
	2	25,000	20,000	125	40	25	25	10	20
	3	40,000	30,000	150	40	25	25	10	20
Residential Neighborhood	1	20,000	12,500	100	40	25	25	10	20
	2	25,000	17,500	125	40	25	25	10	20
	3	35,000	20,000	125	40	25	25	10	20
Village Com (Commercial)	1	10,000	7,500	65	30	25	15	10	20
	1	4,000		50	0	0	0	0	100
Park	1	8,500	4,250	65	30	25	10	5	20
Industrial	1	43,560		150	50	25	25	10	25
	2	87,120		200	50	25	25	10	25
	3	130,680		250	50	25	25	10	25
Commercial	1	20,000	15,000	100	40	25	25	10	20
	2	25,000	20,000	125	40	25	25	10	20
	3	40,000	30,000	150	40	25	25	10	20
	All	30,000		150	50	25	25	10	20
Main St	1	10,000	7,500	65	30	25	15	10	20

Class: 1 = both sewer and water, 2= either sewer or water, 3 = no sewer or water

Parking Requirements

The Lyndon Zoning Ordinance establishes parking requirements for many uses. Under zoning, it is often the parking requirements that actually determine permissible development densities for non-residential development.

A simplified table of parking requirements for the most significant classes of uses is included here.

Parking requirements

Use	number	per	unit
Residential-1&2	2	1	Dwelling units
Residential-multi-family	1.5	1	Dwelling units
Office	1	250	Square feet
Commercial	1	350	Square feet
Industrial	1	1.2	Employee

Parking requirements may be waived in the VC district.

Development densities under zoning

All of these requirements interact to control the density (or intensity) of development within a town. Development intensity for non-residential development is measured by floor area ratio (FAR)¹, while residential intensity is measured by the more easily understood number of dwelling units per acre. In evaluating the potential for new development in the tables below, except for Main St district, new development has been assumed to conform to basic modern standard of single story buildings.

DWELLING UNITS/ACRE

ZONE	Rural Residential			Rural Neighborhood		
	1	2	3	1	2	3
SINGLE FAMILY	2.00	1.60	1.00	2.00	1.60	1.14
2+ FAMILY	2.67	2.00	1.33	3.20	2.29	2.00
Mobile Home	5.00	5.00	5.00	5.00	5.00	5.00

¹ FAR is the ratio of total floor area to total lot area and incorporates floor area on upper floors as well as on the ground floor. Thus, an 8,000 sq ft 1 story building on a 1 acre (40,000 sq foot lot) would have a FAR of 0.2, while a 2 story building on the same footprint (8,000 sq ft) would have a total of 16,000 sq ft for a FAR of 0.4.

Non-residential Development Intensity Under Zoning

Zone	--Lyndon Zoning Districts--								
	Comm	Comm	Main St	IND	IND	IND	IND	IND	IND
Class	I	I	I	I	2	3	I	2	3
Use	Comm	Office	Office	Office	Office	Office	Indus	Indus	Indus
Number of Stories	I	I	2	I	I	I	I	I	I
Parking Required (GFA/Space)	350	250	300	250	250	250	375	375	375
Area per Parking Space (sf)	350	350	350	350	350	350	350	350	350
Size of Site (sf)	30,000	30,000	7,500	43,560	87,120	130,680	43,560	87,120	130,680
Site Frontage (ft)	150	150	65	150	200	250	150	200	250
Front Setback (ft)	50	50	30	50	50	50	50	50	50
Rear Setback (ft)	25	25	25	25	25	25	25	25	25
Side Setback (ft)	25	25	15	25	25	25	25	25	25
Max Building Coverage Ratio	20%	20%	20%	25%	25%	25%	25%	25%	25%
Open Space Ratio Required	0%	0%	0%	0%	0%	0%	0%	0%	0%
Parking Setback (ft)	10	10	10	10	10	10	10	10	10
Final Footprint of Building	6,000	6,000	1,288	10,890	21,780	32,670	10,890	21,780	32,670
Final Floor Area of Building	6,000	6,000	2,575	10,890	21,780	32,670	10,890	21,780	32,670
Floor Area Ratio of Building	0.20	0.20	0.34	0.25	0.25	0.25	0.25	0.25	0.25
Parking Required: Spaces	17	24	9	44	87	131	29	58	87
Parking Area Required (sf)	6,000	8,400	3,005	15,246	30,492	45,738	10,164	20,328	30,492

Except for the two story development postulated in the Main St district, development densities are entirely determined by the limitations on building coverage established by the ordinance.

Findings/ observations

Based on this analysis, a number of findings and observations become apparent:

- General residential densities (including rural) at a minimum of 1.0 du/ac are relatively high by Vermont standards, where it is common to find 3 acre and even 10 acre minimum districts in rural areas.
- Even higher than the generalized residential densities, mobile home density standards at 8,000 sf/du result in gross densities of 5.0 du/ac, even in the most rural districts. This is very high and represents significant impact potential for both transportation and other community services.
- On the other hand, commercial and other general non-residential densities are relatively low, and largely set by coverage limit given preponderance of modern 1 story commercial/industrial construction, especially in outlying areas.

Development potential under zoning

Based on the density and use analysis discussed here, future steps in the process will apply the zoning criteria to specific parcels to develop a corridor build-out analysis that incorporates the interaction of available infrastructure and natural features/limitations with zoning requirements. From this, future transportation demands within the corridor may be anticipated and addressed.

Two additional development characteristics will inform this process:

- Most construction in outlying municipalities such as Lyndon tends to be on vacant/"greenfield" sites, however,
- Broad St has become the focus of new non-residential development, largely due to proximity to I91 Exit 23; there is significant potential for both intensification of existing uses and conversion along this portion of the overall corridor.

Lyndon Zoning: Overall Observations

In addition to the specific analysis of zoning characteristics discussed above, a number of observations relative to the zoning overall present themselves.

First, there are a number of specific zoning features that lend themselves to good development within the community, these include:

- Specific/reduced standards in VC including parking and dimensional requirements, although portions of a number of other districts in village should probably also be included in this, lending itself to some sort of village overlay district,
- The special character of the properties in the Main St and Park districts are recognized and incorporated, and
- The provision for PRD style development (residential cluster development) provides for both the preservation of open spaces while supporting housing.

There are, however, a number of ambiguities and questionable features as well:

- RE computation of lot size: PRD indicates natural features such as wetlands, water and steep slopes are to be deducted from available lot area/density calculations (and implies that this is generally applicable to lot size computations), but the ordinance does not seem to specifically address this issue.
- Although it appears that the dimensional "buffer" excludes all development, including parking, from an area at the edges of lots, this does not appear to be discussed in the ordinance.
- Multi-family dimensional requirements do not appear to be addressed, but must be inferred from the two family requirements, although they have different parking requirements.

From a transportation point of view, the zoning does not address any of a large number of potential means of supporting community transportation goals. At present, there are no specific provisions/standards included with respect to:

- access management, especially curb cuts: including number, location, specs
- sight distances and other safety standards
- trip generation/traffic impact
- some aspects of parking, including design & location standards and bike parking
- pedestrian facilities: sidewalks, pathways, access generally
- transit access/accessibility

Future Trends for the Lyndon Area Corridors

This study focuses primarily on the connecting corridors between the Burke Mountain Ski Resort and the Interstate 91 corridor, as Burke Mountain is planning significant upgrades and expansion to four season operation. The existing conditions for the project study area were summarized in the *Existing Conditions-Lyndon Area Corridor Management Plan* section. This section projects future conditions for the corridor area for both land use and transportation, and builds on information collected and reported in the Burke Mountain Area Transportation Infrastructure Study, prepared by RSG Inc, in September, 2007.

A number of trends will affect conditions on the corridor into the future. Some of these are “site specific”, and others are more general trends that must be considered for effective transportation planning. The following sections discuss these issues, and their implications for the corridors in the study area.

Traffic Growth

The Burke Mountain Infrastructure Report (2007) documented recent growth trends on the corridor roads. Route 5 has seen higher growth than the Routes 122 and 114 corridors. Route 5 shows higher traffic volumes at all stations in 2004, which may have been due to an anomaly during the count, such as a construction project or other event during the count period.

Traffic growth rates at these locations range from 0.6% to 1.0% per year, which is typical compared to statewide averages. While overall traffic growth has been higher up through the 1990s, there has been a decline in traffic growth, resulting in relatively flat trends in many parts of the state. While there is no one single cause for this, it is generally attributed to the aging population in Vermont, as on average, the number of miles as person drives generally declines after about age 50.

The following graph shows traffic data from the corridor area, as well as a map showing the count locations.

Figure 1: VTrans Traffic Count History on Lyndon Area Corridor Roadways

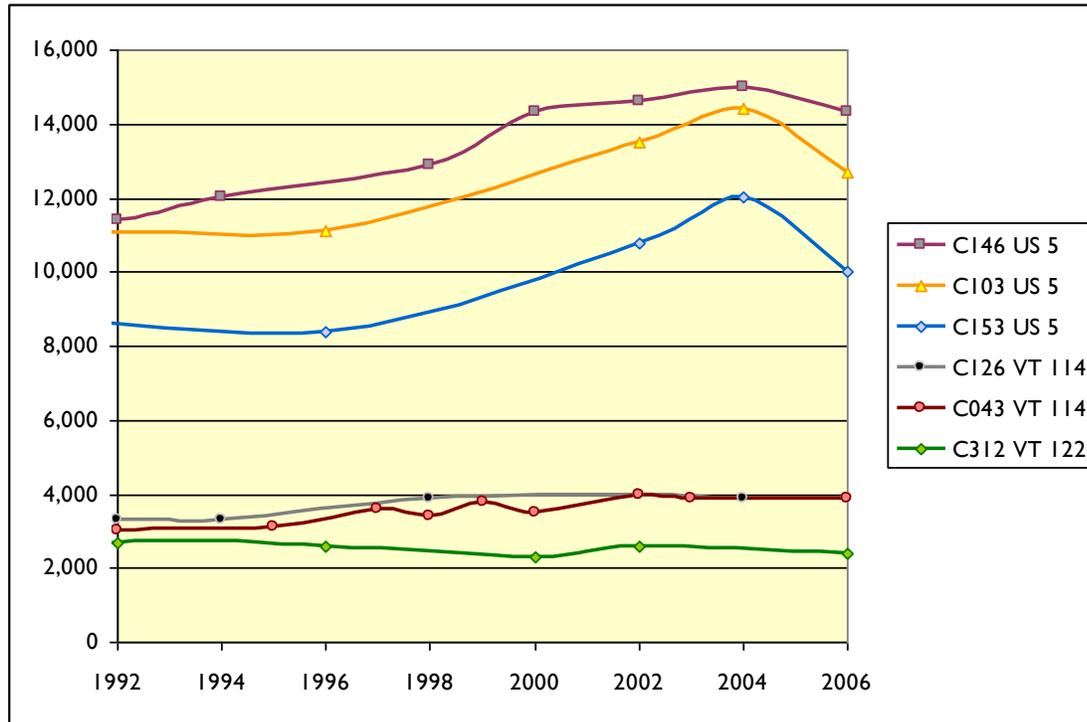
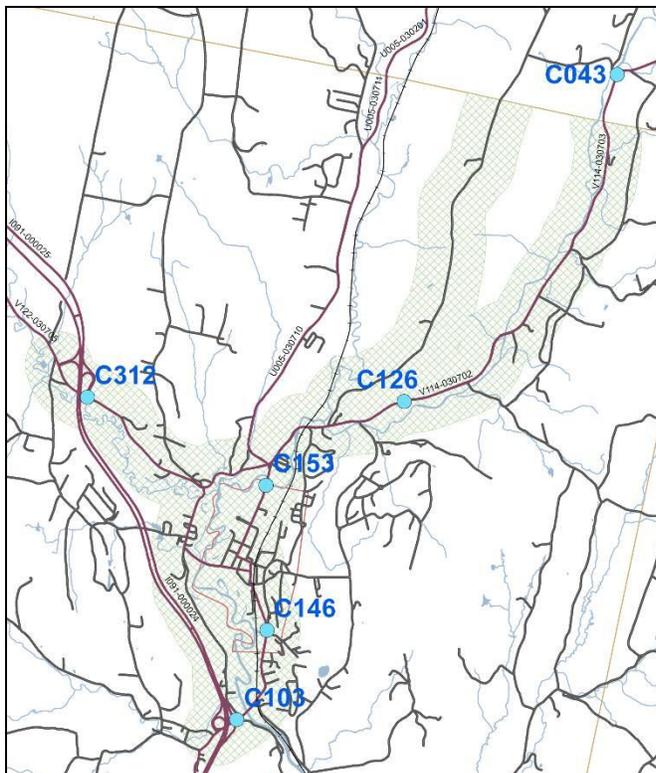


Figure 2: Locations of VTrans Count Stations



Public Transit

Public transit providers are facing extraordinary challenges in this period of high fuel prices. They are contending with growing interest in using transit, higher fuel costs and level or declining funding. Transit in this region is further challenged by the dispersed population and employment centers, which are very difficult to serve efficiently.

Transit service is very vulnerable to cuts in funding or service, as it can lead to a vicious cycle in which transit funding is reduced, therefore service is reduced, therefore fewer people can use transit, which in turn reduces support for funding. This cycle can work the other way as well, with higher levels of funding and service leading to higher ridership and greater use and support. While there is always far from enough funding to meet all of the region's transportation needs, this particular vulnerability for transit is important to consider among the competing priorities.

Bicycling

This mode will always be somewhat limited in our climate, but there is potential for more interest and use of bicycles to happen in the future for both recreation and utilitarian purposes. While site specific data is not readily available for Lyndon, many parts of the country are seeing high use of bicycle transportation since the especially high fuel prices. College students at Lyndon State may be a population that is more likely to cycle, although some of the connecting roads between the college and Lyndonville are not ideal for cycling in their current condition.

A number of factors may also lead to increased recreational bicycling, which can be an important component for the tourist economy. The promotion of "backroads" cycling by NVDA, Kingdom Trails, and others could lead to growth of bicycle traffic during warm weather months. In addition, Burke Mountain's expansion to more four season operations may also bring more cycling interest to the area.

However, as noted in the above section on existing conditions, many of the roads in the area are not well suited for cycling, due to narrow shoulders and high truck traffic volumes. In particular, the Route 114 corridor, which offers outstanding scenery and important connections to Burke Mountain and Kingdom Trails, does not offer safe riding for an average or less experienced cyclist.

Burke Mountain Ski Resort Upgrade and Expansion

Burke Mountain Ski Resort (Burke 2000 LLC) is currently in the permit process for the Bridgemor Project, which consists of two phases as described below. The company is seeking approval for construction of the Phase 1 items, and concept approval for the Phase 2 items. The following list includes the proposed elements of each phase. The development review process will include a detailed assessment of how this will affect traffic and roads.

PHASE I – Construction Approval**Ski Area Improvements:**

- Upgrade and expansion of Sherburne Base Lodge
- Demolition of existing Mid-Burke Lodge
- Construction of temporary Mid-Burke structure
- Installation of new high-speed lift from Mid-Burke to the Summit
- Upgrade and expansion of the existing snow making system
- Add approximately 35 acres of new skiing terrain to existing front face of mountain
- Add approximately 60 acres of new skiing terrain in field above the Cutter Inn
- Addition of chair lift to serve Cutter Inn area
- Back of the house improvements and additions at the current maintenance area adjacent to the Sherburne entrance off Mountain Road. Including but not limited to, trash, recycling, maintenance, sanding, laundry, and storage facilities.

Infrastructure:

- Creation of new water supply system
- Creation of new waste water treatment facility and disposal area
- Creation of new underground fuel storage tank area
- Creation of private roads to and within new housing areas
- Improvements and addition of electrical utility lines

Housing:

- 75 unit condominium project at the base of the Cutter Inn
- 185 unit single and multi-family housing lots above the Cutter Inn area

PHASE II – Conceptual Approval**Ski Area Improvements:**

- Add approximately 60 acres of new skiing terrain in the East Bowl area;
- New chair lift to serve East Bowl area
- Addition of beginning lift/carpet to Mid Burke area

Housing:

- 175 condo units at Mid-Burke
- 210 single family housing lots in proposed golf course area
- 70 condo units adjacent to snowmaking pond at Mid-Burke
- 140 condo units in the area now occupied by Burke campground
- 169 condo units off High Meadows Road

Recreational Facilities:

- 18-hole championship golf course, including clubhouse and maintenance building
- Additional recreational facilities to facilitate existing cross-country skiing, mountain biking, and snowmobiling onto area VAST trails
- Equestrian, racket courts and cross country facilities off Pinkham Road
- Additional amenities including restaurants, bars, retail outlets, pools, spa, fitness area

The above describes the current proposal, and it is possible that some of these elements will be altered during the permit process, or based on market conditions.

Build Out Analysis

Another major determinant in the future operations of the corridor is future growth and development, which is accomplished through a “build-out” analysis. The purpose of a "build-out" analysis within the context of a transportation corridor study is to develop an understanding of the nature, extent, and distribution of future growth. Trip generation and travel demand are not independent variables. They arise from the distribution and intensity of human activity, and the need to travel among these for a variety of purposes. It is this that creates transportation demand, both now and in the future.

The primary control over development in a community is its zoning, especially as this interacts with natural constraints on development and the availability of other utility infrastructure such as water and sewer. Transportation infrastructure, especially roads in rural areas of Vermont, also serves to guide and/or limit growth and development.

By definition, a full build-out itself has no specific time horizon. Rather, it represents the "maxing out" of zoning potential within the study area. It must be kept in mind that the full build-out under current zoning is highly unlikely ever to occur. However, it is a useful tool for understanding possible future development in the corridor for two reasons:

1. It effectively shows the nature, extent, and location of potential future development for which the community is officially planning.
2. While the totality of the “build-out” development is unlikely to ever occur, it is quite likely that some sub-areas will develop largely as shown in the analysis. Because of the proximity to Burke Mountain, much of the land along these corridors will be desirable locations for growth, and undoubtedly some development can occur in a pattern similar to that shown in this analysis.

The basic approach of the build-out analysis has been to analyze the development potential on each individual parcel based on zoning and resource constraints. This process is explained in detail in the “Methodology” section, an addendum to this report. Figure 3 shows the locations of existing residential and commercial development with the corridor. The ultimate outcome of the build-out analysis are displayed in Table 1, below and Figure 4.

Table 1. Lyndon/Burke Corridor Build-out Under Zoning

Existing	Potential New	Increase
Residential (du)		
718	2,430	338%
Non-residential (GFA sf)		
653,596	4,741,376	725%

As may readily be seen from both the table and the map, Lyndon has zoned the corridor for a very high development potential: increases of a factor of about 3 and 7 for residential and non-residential development respectively. To some extent, this underestimates the maximum non-residential potential, since this type of

development has been assumed to occur only on “green-field” (i.e. completely vacant) sites, except within the Broad Street sub-corridor. These assumptions are discussed in more detail in the “Methodology” discussion attached to this report.

Figure 3. Existing corridor development

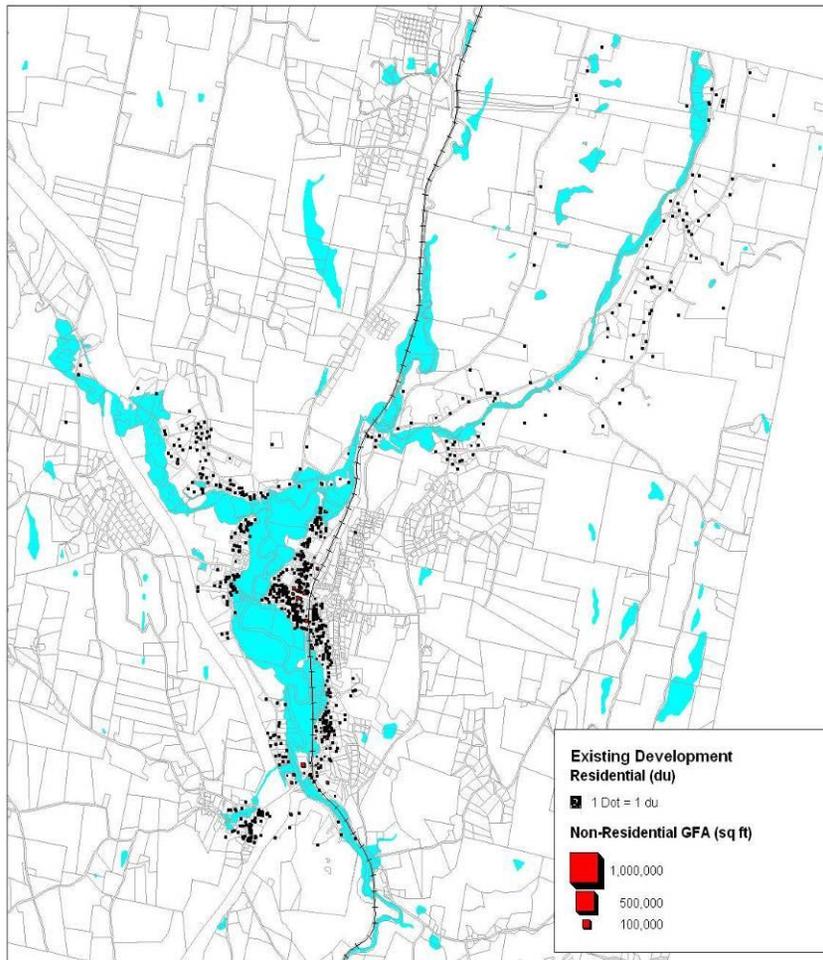
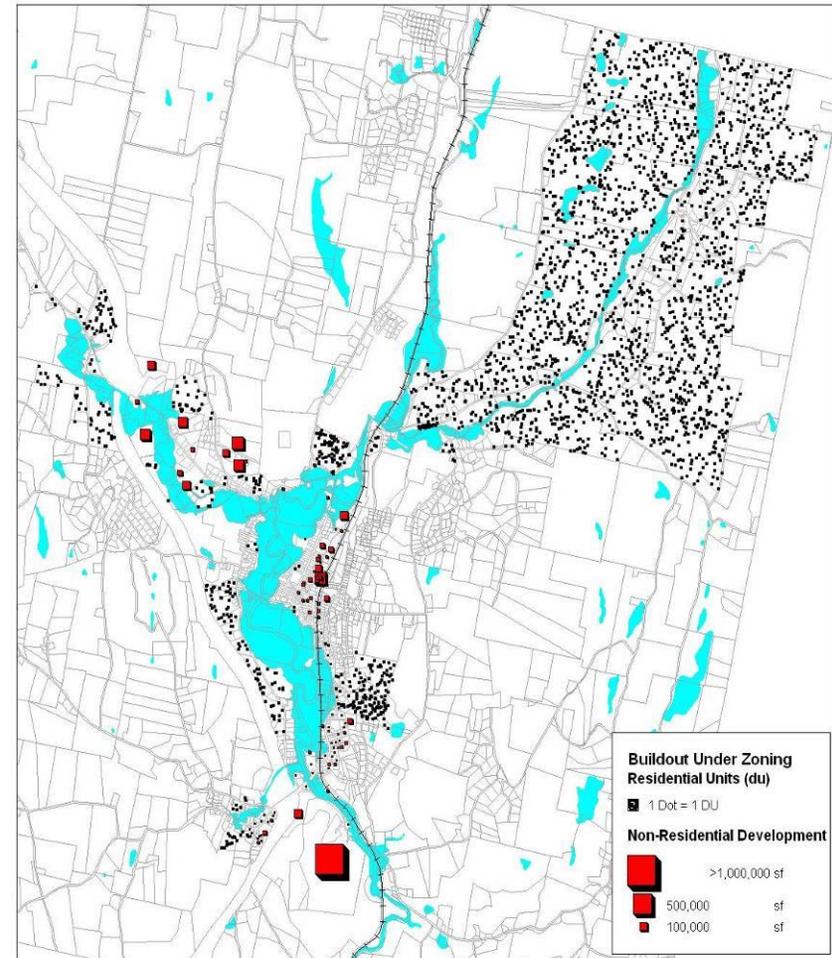


Figure 4. Potential New Units Build-out under zoning



Notes:

Blue shaded area represents land that is not developable due to floodplain, wetlands, or surface water constraints.

The non-residential development potential is about twice as large as residential, which is a fairly typical, due in part to the desire to encourage land uses that generate more employment and tax revenue. Of particular importance is the distribution of the residential development potential. It is concentrated in the scenic 114 sub-corridor, where it could have a very large visual and environmental impact. Simultaneously, there is very little residential potential in and near Lyndonville. This is in part due to a relatively uniform zoning code that has relatively little differentiation in land requirements near the village versus in the outskirts of town. This zoning will result in a pattern of continuous mid-density housing, rather than reinforcing a higher density, compact village center and lower intensity in the rural, scenic corridor areas. The development pattern resulting from the current zoning will maximize the need for auto travel for virtually all trips.

Demographics and Transportation

The Town of Lyndon, and the Northeast Kingdom region and Vermont as whole, has an aging population, which will greatly alter the transportation needs in the coming years. While our past transportation planning has focused on serving growing numbers of automobile commuters in all parts of the state, we are now looking at somewhat flatter growth in commuting and auto travel, but a growing challenge in connecting the elderly population with the goods and services they need to stay healthy, active and productive. Most demographics projections include an increase in the elderly population, that is more likely to be without access to a car.

The following table shows the US Census Data on auto availability for the Town of Lyndon, comparing the data from 1990 to 2000.

Table 2: Vehicles Available by Household, Town of Lyndon, Vermont, 1990 and 2000

Household Vehicle Availability	1990 #	1990 %	2000 #	2000 %	Change Number	Change Percent
No Vehicles Available	145	7.6	198	9.8	+53	+36.6
1 Vehicle Available	744	39.1	733	36.2	-11	-1.5
2 Vehicles Available	762	40.0	755	37.3	-7	-0.9
3 Vehicles Available	232	12.2	255	12.6	23	+9.9
4 Vehicles Available	22	1.2	84	4.2	72	+327.3
Total Households	1905	100.0	2025	100.0	120	6.3

Of particular note is the increased number of households without an automobile. This trend is likely due primarily to the aging of the local population, and accompanying reduction in automobile ownership and driving. This trend is highly likely to continue in the coming decades.

Longer Commutes

Vermont has undergone significant economic restructuring over the past 20 years, which has resulted in greater centralization of employment. For example, many medical services in smaller communities are being relocated to a few more centralized locations such as Fletcher Allen or DHMC. This is true for a variety of sectors of the economy, and has resulted in substantially longer commutes to work for residents of the Northeast Kingdom. The following table compares data on commuting time for residents of the town of Lyndon from the 1990 to 2000 census.

Table 3: Change in Commuting Time for the Town of Lyndon, 1990 to 2000

Travel Time to Work	1990 #	1990 %	2000 #	2000 %	D#	D%
Less than 5 minutes	415	17.3	196	8.0	-219	-52.8
5 to 9 minutes	633	26.4	508	20.8	-125	-19.7
10 to 14 minutes	416	17.3	531	21.7	115	27.6
15 to 19 minutes	474	19.7	401	16.4	-73	-15.4
20 to 29 minutes	246	10.2	367	15.0	121	49.2
30 to 44 minutes	138	5.7	235	9.6	97	70.3
45 or more minutes	80	3.3	206	8.4	126	157.5
TOTAL	2402	100	2444	100	42	1.7

The above data indicates that the cost of commuting has risen sharply for Lyndon residents, due both to the longer commutes and higher fuel prices. Money spent on fuel does little to stimulate the local economy; hence these costs represent a significant drain of financial resources away from the region.

Services such as van pooling, and provision of park and ride lots, are among the improvements that would be appropriate for this trend, particularly due to the cost of fuel eating more heavily into the income of these long distance commuters.

High Fuel Prices

Fuel prices are reaching record highs, and they are unlikely to fall significantly in the coming years. This trend vastly alters the cost of living in more rural parts of Vermont, such as the Northeast Kingdom and Lyndon. The following is an excerpt from recently introduced federal transportation legislation, in response to the steep fuel price increases over the past year or more.

THE PROBLEM:

The rapid rise in the price of oil is threatening American families, our economy, and our national security. Gas prices have more than tripled since 2001, taking an ever-larger bite out of the family budget. On average, transportation costs are now Americans' second largest expense after housing. Most economists as well as most American citizens believe that this is a long term trend, rather than a temporary situation. We've seen the last of the cheap oil on which we've built our economy and our daily lives.

THE SOLUTION:

There is no single solution to the complex energy situation we are facing, but we can equip every member of the American family to live better with less oil. We want to give families and communities more choices, level the playing field for people who want to be less auto-dependent, and encourage the federal government to become a better partner and to lead by example in these efforts.

At \$4.00 a gallon gasoline, most Americans are already changing their daily behaviors to decrease fuel costs: taking fewer trips, keeping their cars tuned, even trading in their gas guzzlers for more fuel-efficient models. More needs to be done to ensure that consumers have transportation and housing options that reduce their reliance on single-occupancy vehicle trips.

The high cost of fuel could have a strongly negative effect on the region's economy as nearly every dollar spent at the pump leaves the region. It is more important than ever to plan land use and transportation systems to reduce the need for vehicular travel. This includes supporting vibrant downtown areas that provide a variety of goods and services with competition as appropriate, to provide the basics of daily life without traveling long distances.

What do these trends mean for the Lyndon Area Corridor Management Plan?

The following sections discuss the implications of these trends and future conditions on the existing corridor infrastructure.

Changes at Burke Mountain

The permitting process that Burke Mountain is currently undergoing will include a detailed evaluation of the traffic and transportation impacts. Because the development program is subject to change somewhat through the process, it is premature to make exact, analytical projections. However, there are some general considerations about how the changes at Burke Mountain will affect the corridor.

Generator of Traffic

The expansion of the ski resort will undoubtedly bring more traffic to the corridor. However, whether or not this traffic contributes to congestion will depend on when the increased traffic occurs. From the evaluation of existing conditions, it was noted that the worst traffic congestion occurs on Friday afternoons, particularly during the summer. Numerous traffic counts conducted by VTrans and RSG Inc. indicate that peak traffic occurs during the summer months, and not during ski season. In addition, the plans for Burke Mountain may be more likely to generate longer term "Saturday to Saturday" visits, due to its greater distance to population centers compared to other Vermont ski areas. Therefore, the direct impact of Burke's expansion on traffic congestion appears likely to be limited.

Generator of Growth

Burke's expansion could result in increased growth in Lyndon, and this may be of greater significance to the corridor than the actual traffic headed to Burke Mountain. The upgrade and expansion of the ski resort will likely result in an increased demand for workforce housing, and it appears that the current plans for Burke Mountain do not include workforce housing. Therefore, this growth will likely be accommodated in the nearby communities, including Lyndon. The build-out analysis reveals that there is ample capacity for residential growth, particularly along the Route 114 corridor.

In addition, the increased number of vacationers in the area will create opportunities for businesses serving these visitors, ranging from restaurants to canoe or bike rentals to medical services...everything people may need while they are on vacation. As shown in the build-out analysis, there is ample room for commercial growth.

The build-out analysis shows that there are currently very few restrictions to this type of growth, and the zoning provides very little guidance as to the way the growth is organized. The more scattered and dispersed this growth is, the more traffic it will generate, as opportunities to combine several trips with one stop are limited.

Traffic Congestion

Traffic growth rates are modest in the corridor, approximately 1% per year, even with the Burke expansion. The *Phase 1* report by RSG Inc. provided extensive analysis of traffic congestion, which are summarized below in the tables and graphics excerpted from this report.

Table 2: Signalized LOS Results

Signalized Intersections	Saturday AM Peak Hour 2007		2027		Saturday PM Peak Hour 2007		2027	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
US 5/VT 114/Stevens Loop								
Overall	B	11	B	12	B	12	B	15
EB, along Stevens Loop	A	6	A	6	A	6	A	7
WB, along VT 114	B	11	B	12	B	15	C	20
NB, along US 5	B	12	B	13	B	12	B	13
SB, along US 5	B	12	B	14	B	11	B	12
US 5/Back Center Rd/Calkins Dr								
Overall	A	6	A	6	A	6	A	6
EB, exiting Back Center Rd	D	37	D	37	D	37	D	37
WB, exiting Calkins Dr	D	36	D	36	D	36	D	36
NB, along US 5 toward VT 114	A	3	A	3	A	3	A	3
SB, along US 5 toward Exit 23	A	3	A	3	A	3	A	3

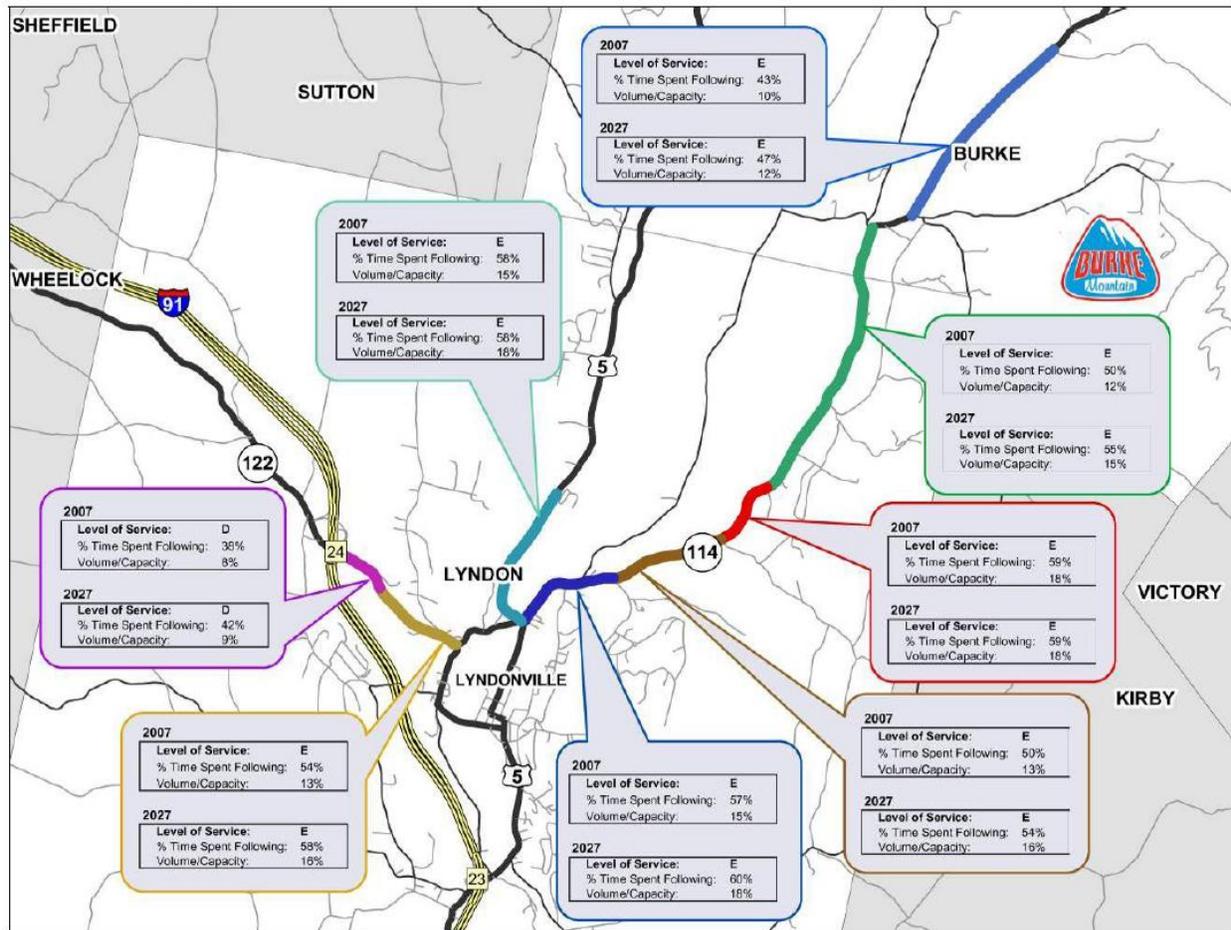
Burke Mountain Area Transportation Infrastructure Study, RSG Inc, 2007. page 8.

Table 3: Unsignalized LOS Results (red highlighting = substandard LOS)

Unsignalized Intersections	Saturday AM Peak Hour 2007			2027			Saturday PM Peak Hour 2007			2027		
	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c
VT 114/Pinkham Rd												
WB Left/Right, exiting Pinkham Rd	A	10	0.00	A	10	0.01	A	9	0.00	A	9	0.00
SB Left/Through, along VT 114 toward US 5	A	<1	0.00	A	<1	0.00	A	<1	0.00	A	<1	0.00
VT 114/Mountain Rd												
WB Left/Right, exiting Mountain Rd	B	15	0.40	C	15	0.41	C	16	0.54	C	17	0.55
SB Left/Through, along VT 114 toward US 5	A	<1	0.01	A	<1	0.01	A	<1	0.01	A	<1	0.01
VT 114/East Darling Hill Rd												
EB Left/Right, exiting Post Office Drwy	B	14	0.14	B	15	0.17	C	15	0.13	C	17	0.16
NB Left/Through, along VT 114 toward East Haven	A	<1	0.01	A	<1	0.01	A	<1	0.02	A	<1	0.02
VT 114/Darling Hill Rd												
EB Left/Through, along VT 114 toward East Haven	A	<1	0.01	A	<1	0.01	A	<1	0.02	A	<1	0.02
SB Left/Right, exiting Darling Hill Rd	B	10	0.02	B	11	0.03	B	12	0.03	B	13	0.03
US 5/Depot St/Main St												
WB Left/Right, along US 5/Depot St	A	<1	0.02	A	<1	0.02	A	<1	0.02	A	<1	0.03
NB Through/Right, along Main St	C	24	0.21	D	31	0.30	C	19	0.09	C	22	0.12
US 5/Depot St/Broad St												
EB Left/Through/Right, exiting US 5/Depot St	C	16	0.52	C	23	0.70	B	15	0.46	C	19	0.59
WB Left, exiting Depot St	F	>100	3.61	F	>100	9.35	F	>100	1.43	F	>100	3.48
WB Through/Right, exiting Depot St	F	52	0.46	F	>100	0.70	E	45	0.33	F	78	0.52
NB Left/Through/Right, along US 5/Broad St	A	7	0.32	A	7	0.36	A	8	0.33	A	8	0.38
SB Left/Through/Right, exiting Angie's Alley	A	<1	0.00	A	<1	0.00	A	<1	0.00	A	<1	0.00
US 5/Red Village Rd												
WB Left/Right, exiting Red Village Rd	D	29	0.47	F	84	0.81	C	21	0.37	D	35	0.58
SB Left, along US 5 entering Red Village Rd	A	9	0.08	A	10	0.11	A	9	0.07	A	9	0.10
US 5/I-91 Exit 23 NB Ramps												
WB Left/Through/Right, exiting Ramps	B	14	0.47	C	18	0.57	B	13	0.43	C	16	0.53
NB Left, along US 5 entering Ramps	A	9	0.01	A	9	0.01	A	9	0.01	A	9	0.02
US 5/I-91 Exit 23 SB Ramps												
EB Left/Right, exiting Ramps	B	12	0.06	B	14	0.09	B	12	0.03	B	13	0.04
NB Left, along US 5 toward VT 114	A	9	0.01	A	9	0.02	A	9	0.01	A	9	0.01
VT 122/Center St/Stevens Loop												
EB Left/Through/Right, along VT 122 toward US 5	A	<1	0.01	A	<1	0.01	A	<1	0.00	A	<1	0.00
WB Left/Through/Right, along VT 122 toward Exit 24	A	3	0.07	A	4	0.08	A	3	0.05	A	3	0.05
NB Left/Through/Right, exiting Center St	B	13	0.22	C	15	0.29	B	12	0.15	B	13	0.19
SB Left/Through/Right, exiting Pudding Hill Rd	C	17	0.23	C	20	0.31	B	12	0.10	B	13	0.13
VT 122/I-91 Exit 24 NB Ramps												
EB Left/Through, along VT 122 toward US 5	A	<1	0.00	A	<1	0.00	A	<1	0.00	A	<1	0.00
SB Left/Right, exiting Ramps	A	10	0.09	A	10	0.10	B	11	0.13	B	11	0.16
VT 122/I-91 Exit 24 SB Ramps												
EB Left/Through, along VT 122 toward US 5	A	2	0.03	A	2	0.04	A	3	0.02	A	3	0.03
SB Left/Right, exiting Ramps	B	11	0.06	B	11	0.07	B	10	0.03	B	11	0.04

Burke Mountain Area Transportation Infrastructure Study, RSG Inc, 2007. page 9.

Figure 6: Road Segment Level of Service



Burke Mountain Area Transportation Infrastructure Study, RSG Inc, 2007. page 10.

Traffic congestion is currently limited to the Broad Street corridor and downtown Lyndonville, during afternoon peak hours. The planned improvements on Broad Street will largely alleviate the congestion for through traffic by providing left turns at key locations. However, funding for this project is not available at this time, and short term strategies to address this congestion will be appropriate for this corridor management plan.

Another aspect of the traffic congestion is the difficulty in turning onto Broad Street from the unsignalized driveways and intersections. This will not be alleviated by the project, and is likely to get worse over time, due to more driveways, more intensive land uses, and higher through traffic volumes on Route 5. This is another important aspect that should be addressed within the corridor management plan.

Traffic Safety

Several projects in recent years have addressed the most serious traffic safety concerns in the project area, including the traffic signal at US 5/Route 114, and the narrow bridge on Route 114. The Broad Street project will address the high accident rate in that corridor, by eliminating many rear end collisions between turning and through traffic. Otherwise, traffic accidents will likely increase with the overall traffic volumes. Several locations of concern are the intersection of Hill Street and Broad Street, where the combination of high

through traffic and restricted sight distance has resulted in accidents, which will increase as traffic grows. The difficulty in making left turns from unsignalized intersections can lead to more risk-taking, which is a concern that should be addressed in this corridor management plan.

Land Use and Transportation Connection

The build-out analysis shows that both residential and commercial development in the future will be much more dispersed than it is today. This can be illustrated by comparing the average distance of each residence to the “center of town.” Currently, the average distance between each residence in the study area and the Darling Inn, which represents a central location in Lyndonville, is 0.9 miles. The build-out analysis shows locations of future residences, based on both the town’s zoning and environmental constraints.

In the build-out conditions, the average distance between residences and the Darling Inn (as shown in Figure 4) jumps to 2.6 miles, almost three times as high as current conditions. Under the current zoning ordinance, the future population in the corridor area will be much more dispersed, which generally leads to more dependency on automobiles, given the difficulty in relying on transit or bicycles.

It is important for the Town of Lyndon to fully understand the implications of the current zoning on the future transportation needs. At a time when the elderly population is growing, and there will more people without access to an automobile, the zoning will essentially push new development further from the center of town, where many goods and services can be obtained within walking distance.

Scenic Resources

The build-out analysis shows that there is potential for high amounts of relatively scattered growth that could unfold over time. While the maps on Figures 3 and 4 show the relative locations of this new growth, it does not address how this will affect the visual environment of the corridors. We have included some illustrative graphics, taken from a 1991 publication of the Vermont Agency of Natural Resources: *Vermont Scenic Landscapes: A Guide for Growth and Protection*. These graphics help to illustrate the effect of this type and intensity of development as experienced by the typical local user.

Two basic circumstances have been considered: 1. residential development on open land, not unlike that encountered in the Route 114 portions of the corridor; and 2. commercial development along the roadway with residential development on the surrounding hillsides not unlike the highway commercial development that characterizes the non-residential development conditions outside the immediate core village area. The following figures compare a before and after build-out visual analysis for locations that are not unlike the Route 114 and Main Street corridors.

Figure 3 Unbuilt residential landscape



Figure 4 Uncontrolled residential development

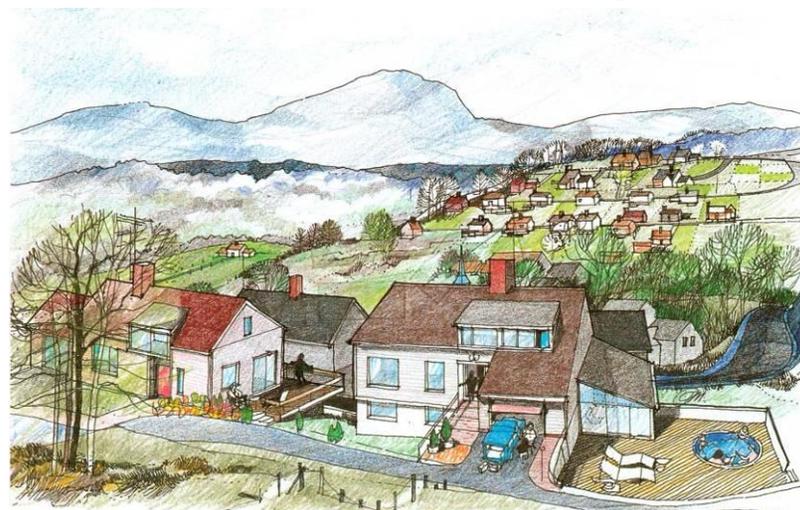


Figure 5 Unbuilt highway landscape

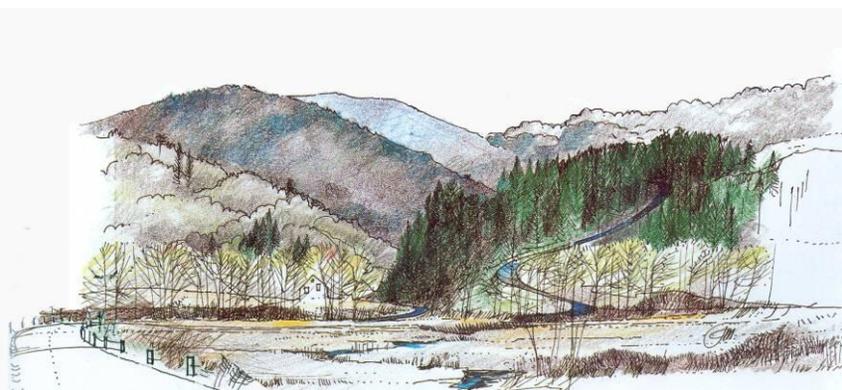
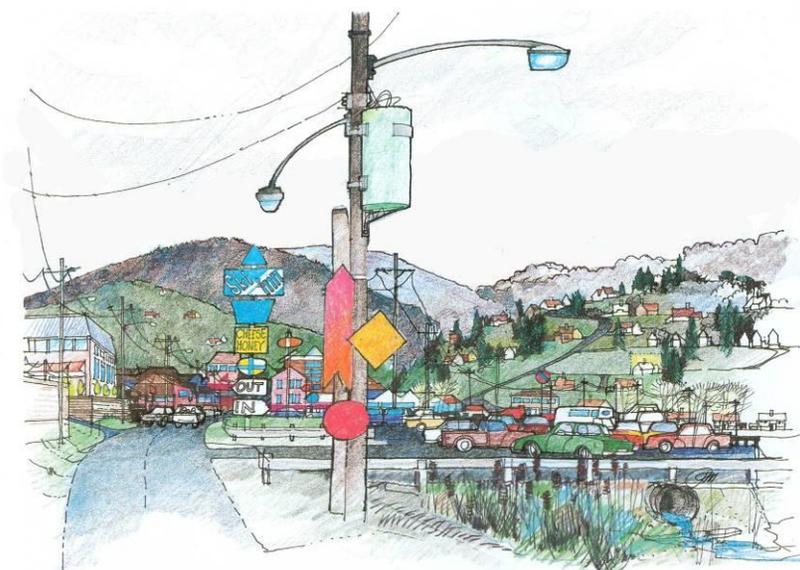


Figure 6 Highway commercial development



Findings

There are a number of trends discussed above that should be of concern to the community, and will be explored in the next phase of this corridor management plan, which will be to develop strategies and tools. The following is an initial list of priorities to address in the Corridor Management Plan, and is proposed for input and additions by the project steering committee and the public. These include both land use and transportation issues, as appropriate to fully address transportation.

Access Management: All of the corridors within the study area are likely to see growth, either commercial or residential. The Broad Street corridor provides a model of the risks of uncontrolled access, and the high cost of fixing it later by retrofits. Access management plans and strategies should be developed for each context zone for the corridors, with appropriate tools for the type of growth projected.

Reducing the Cost of Transportation: The Corridor Management Plan should seek to increase opportunities for residents to lower their transportation costs through alternatives such as ridesharing, vanpooling, walking, bicycling, or using transit.

Residential Growth Patterns: The current zoning ordinance may unintentionally encourage a more dispersed growth pattern. At the same time, the elderly population is increasing, and may be better served in more centrally located housing.

Commercial Growth Patterns: The current zoning also allows high levels of commercial growth outside of Lyndonville and Broad Street. The effects of this zoning could be to further disperse non-residential land uses, which also have transportation implications, requiring higher levels of automobile travel.

Protection of Scenic and Natural Resources: The Lyndon Area enjoys outstanding scenery and a pristine environment. Growth is inevitable, but there are choices about where and how the growth can occur that have significant implications on these resources. The corridor management plan should seek ways to provide for the desired growth without sacrificing other important resources, using planning and design techniques.

Vision, Strategies and Recommendations for the Lyndon Area Corridor Management Plan

Vision

Corridor Management Planning provides an opportunity to take stock of current conditions on a transportation corridor, look to the future at influences on the corridor, and develop strategies that address the emerging challenges that are feasible, affordable, and that seek to mitigate or prevent problems before they occur to the greatest extent possible. The Lyndon corridor management planning process has been instituted in significant measure in response to anticipated expansion at the Burke Mountain Resort. The project RFP describes the circumstances as follows:

"The Burke Mountain Resort is in the process of a major expansion of on-mountain housing by approximately 1025 units and would like to transition into a four season resort with the addition of a golf course as well as other non-winter activities.

"This development will be added to an already dynamic area. The Town of Lyndon is identified in NVDA's Regional Transportation Plan as the town with the greatest projected employment growth by 2020. A major link between I-91 and Burke Mountain is Broad Street (US Rte 5) in Lyndon. This is a major hub of economic activity for the area and is already the object of a VTrans project to reconfigure the roadway to address the access management concerns that reduce the overall effectiveness of the highway and the attractiveness of the location for businesses."

The Lyndon area access routes to Burke Mountain, which comprise the study area for this plan, are complexly structured. It incorporates three numbered highway segments (US Route 5 and Vermont Routes 114 and 122) and parallel roadways, two interstate interchanges (I-91 exits 23 and 24) as well as the entire village of Lyndonville. However, for all its complexity, it does represent the effective corridor most directly impacted by access to and from Burke Mountain Resort's projected expansion.

Draft Town Plan

The Draft Lyndon Town Plan offers some guidance as to the visions of the corridor, as well as evolving concerns related to corridor management. Several excerpts follow which summarize these concerns:

U. S. Route # 5, known locally as North Main Street, is the only means of access to and from the heart of the Town of Lyndon from the north. All persons traveling through Lyndonville must travel on North Main Street, and their impression of the Town of Lyndon will be affected by the land uses on and appearance of Main Street.

- *There is strong sentiment that we need to protect Lyndon as a "walking" town and keep the town walk-able and safe for pedestrians and recreational walkers.*
- *The views are for everyone; we should be sure that development does not turn us into a town of haves and have-nots.*
- *Route 5 does not reflect well on our community. We are not proud of the way it looks, from the lack of visual consistency in signage and the varying quality of buildings to the empty lots and disorganized and growing traffic.*
- *We need to define, maintain, and increase our small town charm; this is our biggest selling point for population growth ("people want what we have").*

- *As a small town in a wired world, Lyndon cannot meet all of the cultural/entertainment needs of its citizens; our interdependence with surrounding towns and their cultural offerings should be acknowledged and supported.*

11. Maintain a steady pace of traffic (35 mph max) through downtown Lyndonville, to allow downtown businesses to be seen, provide efficient ingress-egress, and provide for pedestrian safety. (It is also noted how hard it is to make left turns on Broad St & generally support Broad St as the core economic area.)

VT Route 114, VT Route 122, U.S. Route 5, and Red Village Road provide Lyndon with direct connections to all its surrounding towns. Because of these main roads, Lyndon has evolved into a regional center for more isolated towns in northern Caledonia County and Essex County. Other roads, such as Darling Hill Road and Diamond Hill Road, provide scenic views of the surrounding landscape.

The Town Plan also included a survey of residents that revealed several significant findings.

Generally, most respondents agreed that the roads were safe and adequate, except for sharing the road with bicyclists and pedestrians. There were numerous comments indicating need and support for sidewalks and bike paths, for both travel and recreation.

38. For automotive travel in Lyndon:							
answer options	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Sure	No Opinion	Response Count
Roadways are safe and adequate.	7.2% (17)	46.4% (110)	34.6% (82)	9.3% (22)	1.7% (4)	0.8% (2)	237
Road sharing (motorized vehicles, bicycles, pedestrians) is safe and adequate.	2.9% (7)	29.9% (72)	44.0% (106)	18.3% (44)	1.7% (4)	3.3% (8)	241
Speed limits are clearly posted and safe.	6.3% (15)	69.0% (165)	17.2% (41)	5.9% (14)	0.8% (2)	0.8% (2)	239
Road capacity provides for efficient travel.	5.0% (12)	42.9% (102)	37.8% (90)	10.9% (26)	1.7% (4)	1.7% (4)	238
Parking in Lyndon is safe and adequate.	5.9% (14)	52.5% (125)	29.0% (69)	8.4% (20)	2.5% (6)	1.7% (4)	238
Entering and leaving parking lots and parking spaces is safe and adequate.	3.4% (8)	45.1% (106)	35.7% (84)	12.8% (30)	2.1% (5)	0.9% (2)	235

Corridor Management Plan Vision Statement

Early in the process, the project management committee established three goals of the Lyndon for this corridor management plan:

- 1) Develop a plan with strategies that will prevent problems such as traffic congestion that is currently an issue on Broad Street.
- 2) Identify affordable, short term improvements in spot locations for early implementation that will address safety or circulation issues.
- 3) Develop a conceptual growth strategy for the corridor, in regards to potential secondary growth that may arise from Burke Mountain's expansion.

Key findings

Upon exploring the current and possible future conditions on the corridor, there are a number of areas of concern, or where the community may be falling short of this vision. The following are a few general themes that have emerged at advisory committee meetings and at the public workshop.

1. Considerable deterioration of the roadway functionality of Broad St/Rt 5 corridor due to roadside access "friction", stopping for left turns, safety issues due to traffic bypassing left turn queues, and not being seen by other entering traffic. Also, there is a lack of pedestrian facilities in the corridor which poses a danger to both pedestrians and drivers.
2. Access to Broad Street from side streets can be difficult due to poor sight lines and/or geometric deficiencies (usually inadequate intersection definition). High through traffic volumes result in entering traffic "taking their chances", and making left turns in small gaps, which can be unsafe.
3. Bicycles: While there are abundant off-road bicycling opportunities in Lyndon, it is challenging for the average person to ride a bike on many of the roads in town, and riding to the elementary school is particularly difficult for students.
4. Pedestrians: The downtown area has an extensive sidewalk network that serves Lyndonville very well. The primary gaps in the network are for sidewalks along Broad Street, where many people have to walk on a daily basis, and for access to the elementary school.
5. There is growth potential, based on the build-out analysis of current zoning, for traffic to triple on these corridors. This volume would be substantially above capacity of the roadways, indicating that the zoning allows unrealistically high development potential. In order to allow all landowners a "bite at the apple", the zoning should be adjusted to a level so that a few landowners wouldn't be able to consume all of the transportation capacity by fully developing their land.
6. The parking is adequate to plentiful for existing village uses. If additional growth occurs in the village, better utilization of existing parking, better connections to parking off the Depot Street block, or overflow parking would be helpful.
7. Currently, zoned development acts to spread density and trips fairly evenly throughout the corridor, increasing both total trips and trips by private auto; access by other means/modes difficult
8. Industrial/Commercial zone (I/C) at I-91 Exit 24 is basically a catchall zoning district, with few restrictions on land uses. This is especially of concerns as directly abuts an interstate exit, and could be the focus of rapid, unplanned growth if economic conditions allow.
9. High commercial development potential at Exit 23, to the southeast of the interchange, could provide an opportunity for substantial change without a planning foundation.
10. The large area of largely undevelopable floodplain through the center of the community offers both limitations and unique opportunities. While it limits somewhat the potential for development concentration in the village, it also offers unique opportunities for natural areas, recreation, and walking/biking trails that support and humanize an intensively developed village core.

Summary of Corridor Management Strategies

The following matrix provides a summary of the strategies that are described in this memorandum, and identifies the key goals and needs that would be advanced by that strategy. The strategies are described in more detail in the remainder of the memorandum, and this table is provided to place them into context of the overall goals of this Corridor Management Plan.

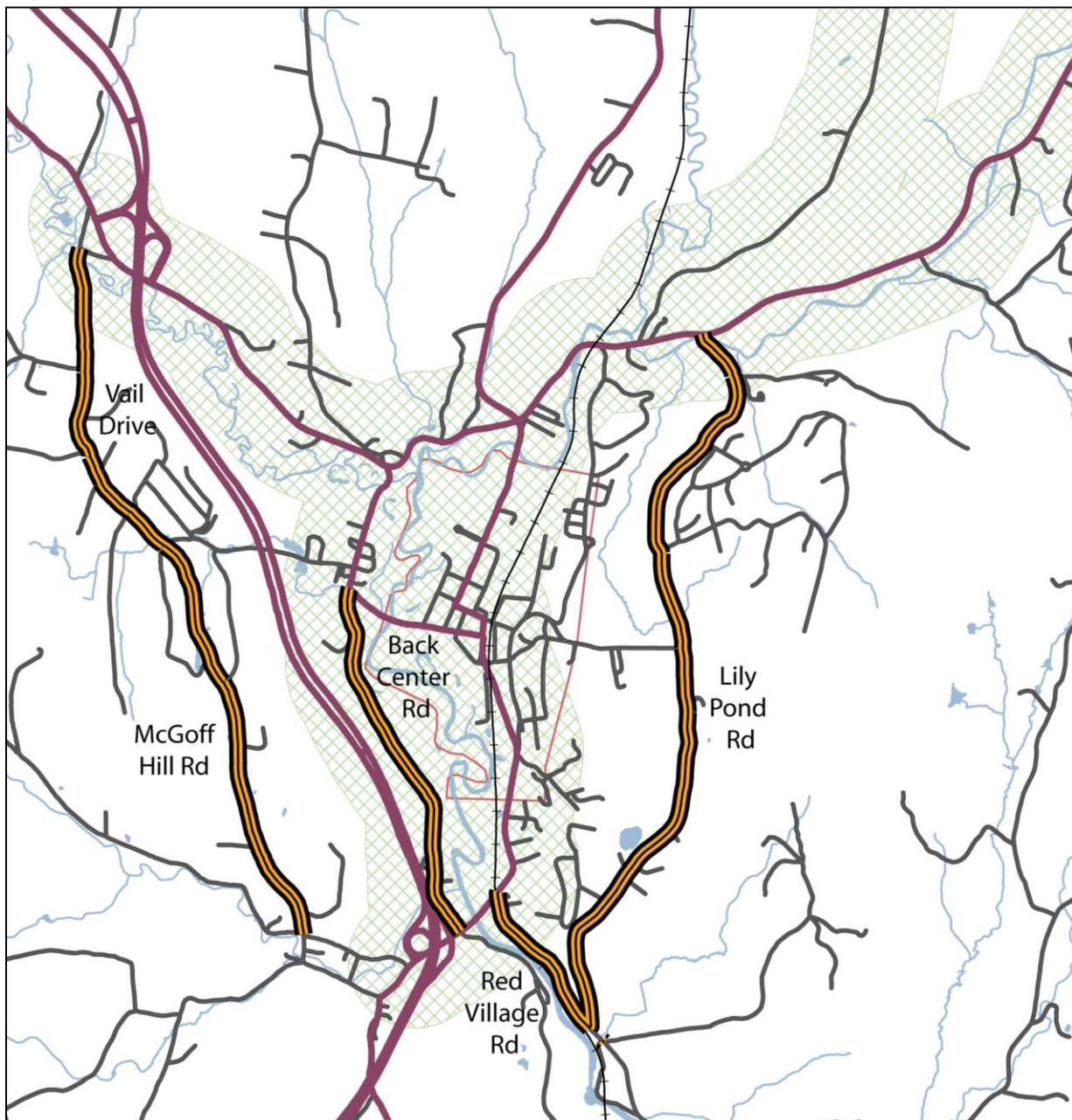
Strategies	Address Traffic Congestion, especially on Broad Street	Aging Population Requires more efficient transportation services	Promote Growth and Vitality in downtown Lyndonville	Manage traffic growth to avoid need for future costly improvements	Provide more transportation choices-walking, biking, transit	Maintain Lyndon's Unique Environment of scenic beauty and walkable village
Broad Street Project: Access Management, Sidewalks	✓		✓	✓	✓	✓
Improve Local Road network to provide alternatives to Broad Street	✓		✓			
Establish Truck Route on 122			✓			
Route 114 Bicycle Lanes					✓	
Travel Demand Management, i.e. staggered shifts	✓			✓		
Improved Public Transit, i.e. Burke Shuttle and Regional services		✓	✓		✓	
Park and Ride Lot near Exit 23	✓	✓			✓	
Safe Routes to School Project		✓		✓	✓	
Zoning Adjustments on Land Uses		✓	✓			✓
Zoning Adjustments on Density	✓	✓	✓		✓	✓
Access Management in Land Use regulations	✓			✓		✓
Pedestrian and Transit Support through Land Use Regulations		✓		✓	✓	✓

Transportation Design Options

The following section describes some ideas that were received in the public meeting with regards to how the road network in Lyndon is managed. Following that are sections that describe design options for the key areas of the corridor: Broad Street, Downtown Lyndonville, North Main Street, Route 114, and Route 122.

Local Road Network

Lyndon is unique in having several corridors that run parallel to Broad Street in some fashion. These roads have shown some growth in traffic, which indicates that they may be serving as bypass or alternative routes to Broad Street, for those wishing to avoid the occasional traffic congestion. These routes are shown on the map below, and include Back Center Road, Red Village/Lily Pond Roads, and McGoff Hill Road/Vail Drive.



Having a redundant road network is clearly an asset, as it provides for alternate routes in the case of road closures or during traffic congestion. On the other hand, residents along the parallel roads are concerned about the safety and impacts of high speed through traffic. As the town maintains or improves any of these parallel roads, it is important to be mindful about the overall goals. Should use of these roads by through traffic be encouraged, thereby relieving Broad Street and downtown Lyndonville of some through traffic? Or should through traffic be discouraged by traffic calming, maintaining gravel surfaces rather than paving, or other techniques? The costs and benefits of such improvements should be considered carefully before further planning occurs.

As an example, some workshop participants who live on Lily Pond Road feel that traffic is already using the road, yet the road conditions are not safe or adequate for the current volumes, so the road should probably be improved. Paving could be combined with traffic calming or safety improvements, to allow it to safely serve more traffic, while trying to reduce the impact of speeding traffic on the local neighborhoods. In general, the presence of a redundant street network is a great asset, as it allows for alternative routes during emergency, or special events when congestion may be extreme.

Design Options for Broad Street

The Broad Street corridor is clearly the highest priority traffic issue for the Town of Lyndon. A variety of ideas for Broad Street have been expressed at the public meeting held for this project, as well as in the Lyndon Town Plan and at the Steering Committee. Of course, not all of the input or ideas are compatible, but they do lend themselves to three general approaches to consider, mix and match, or refine into a solution:

VTrans Three Lane Cross Section-The VTrans project could be maintained generally as designed, with some possible refinements to reduce the cost and amount of pavement. It could also include some innovative stormwater treatment concepts that would make additional right of way acquisition for stormwater treatment unnecessary, which has been a challenge for this project to date. The following figure shows the extent of the left turn lane as currently designed. Also shown is a suggested scaling back of the left turn lane, so that it is targeted to the highest traffic generating uses. As additional land uses are developed that may generate higher volumes of left turns, the development review process could require the extension of the left turn lane.

Left Turn Configurations for VTrans Project and Proposed Modification

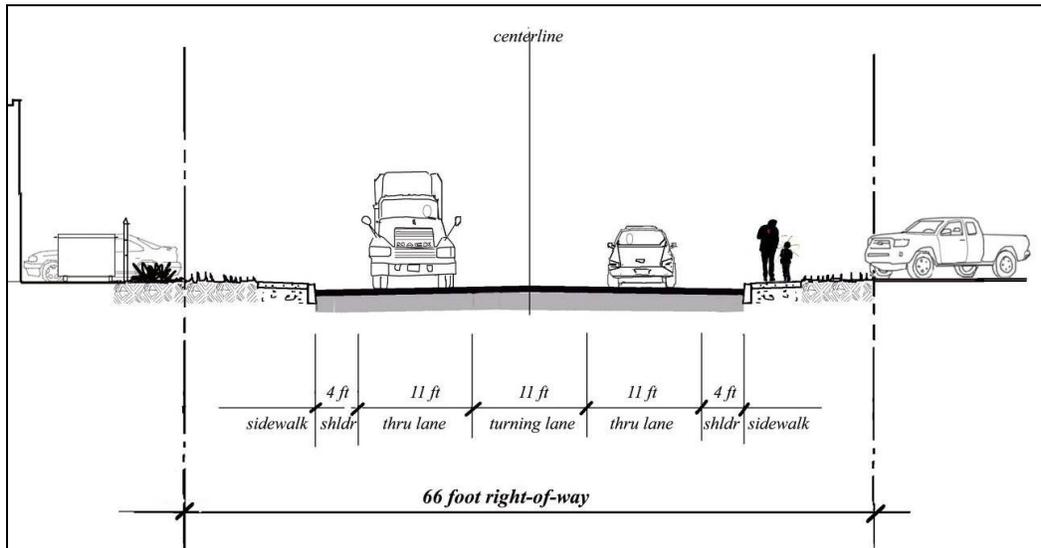
VTrans Project Plans



Possible Modifications

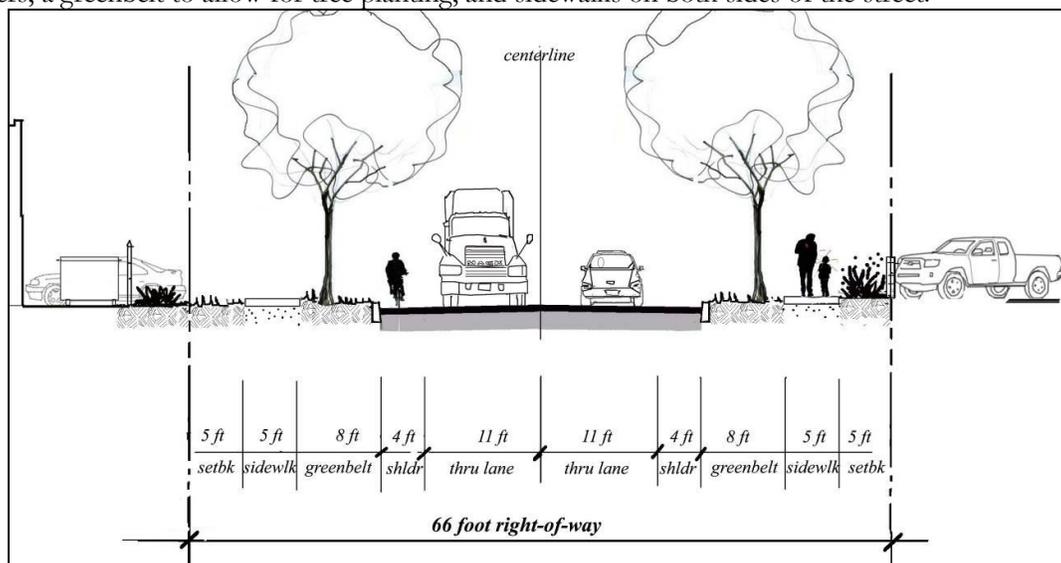


The following figure shows the proposed cross section of the VTrans plan, which includes 11 foot travel lanes and 5 ft sidewalks.



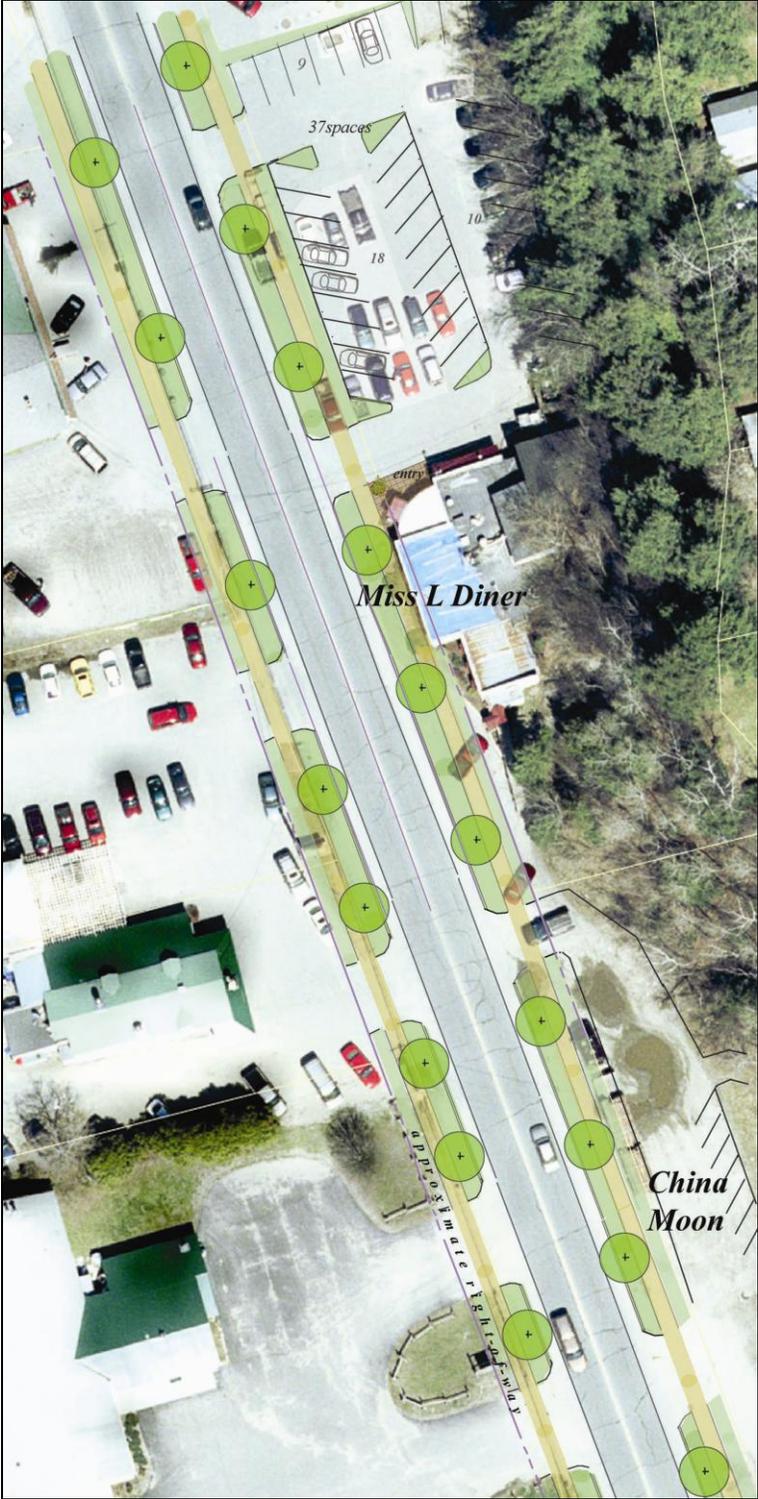
Two Lane Cross Section-This concept arose from input from residents who are concerned that the three lane cross section proposed by VTrans will lead to higher speeds, and make it more difficult to make left turns out of side accesses. This type of plan could be constructed in place of the current VTrans plan if funding can be made available. Also, it could be implemented over time, with construction assistance by landowners as part of the site development approval process. Directional left turn lanes (i.e. either southbound or northbound only, rather than two-way lanes as proposed by VTrans) can be provided in locations with high turning volumes as needed, and at the intersections of Red Village Road and Tute Hill/Charles Street.

The following sketch shows a proposed cross section of the two lane cross section, along with 4 feet bicycle shoulders, a greenbelt to allow for tree planting, and sidewalks on both sides of the street.



The next drawing shows an aerial view of how this plan would fit into the existing roadway. The example shown includes the Miss Lyndonville Diner, which is an area where the parking area extends into the state-owned right-of-way.

Example of Two Lane Broad Street Plan with Sidewalk and Greenbelt



Broad Street Intersection Concepts

Several intersections on the Broad Street corridor are of particular concern, as expressed in the public meeting, in the Lyndon Town Plan, as well as in the comments for the Lyndon Town Plan Survey. The following is a synopsis of the issues.

Red Village Road- Traffic has grown on this intersection, due in part to local land uses and to increasing use of Lily Pond Road as an alternative route to Broad Street. It is increasingly difficult for traffic turning left onto Broad Street, and there have long been calls for a traffic signal. VTrans is currently developing plans for signaling and improving this intersection, which are particularly challenging due to the railroad right of way constraining design options.

Tute Hill/Charles Street- Charles Street was designated as a one-way street due to safety concerns at this intersection. This has created inconvenience for local residents, as well as additional traffic on Broad Street. This intersection does not meet signal warrants, due to relatively low traffic volumes, so unsignalized options should be considered. This intersection is included in the Broad Street VTrans project.

South/Hill St- This intersection has particularly poor sight distanced for traffic entering from Hill Street, due to the historic Bag Balm building on Broad Street. Traffic volumes are not sufficient to warrant a signal at this location, although safety issues could justify a signal, as accidents are frequent at this location. Other improvement concepts are presented below. The first one essentially tightens the corners, which clarifies the vehicle paths, and prevents passing on the right by northbound traffic, as this greatly complicates turning from either of the side streets. This concept would also be compatible with access management at the former Bag Balm parking area, and a sidewalk on Broad Street.



Roundabout Corridor

Another possible concept to consider for the Broad Street corridor is a roundabout corridor. There was interest expressed at the public meeting in developing ways to make U-turns, so that when making a left turn onto Broad Street is difficult, drivers instead could turn right, and make a U-turn at the next roundabout.

The concept shown to the right has roundabouts at Memorial Drive (currently signalized), Pleasant Street, Tute Hill/Charles Streets, and South/Hill Street. The roundabouts are spaced approximately 1,000 feet apart, which allows for relatively convenient U-turns for traffic entering Broad Street.

Advantages of roundabouts include their very high safety record, traffic calming effect, aesthetic opportunities, and very high traffic capacity. Further, they do not require a “warrant analysis” that signalization requires, which could prove to be an obstacle to signalizing locations on Broad Street other than at Red Village Road. They can be designed to provide safe bicycle and pedestrian access as well, and would be sized to allow for the large trucks that use the Broad Street corridor.

Disadvantages of roundabouts include the likely need for additional right-of-way at the intersection corners, and the cost of construction. The possibility of incorporating some roundabouts into the Broad Street project may be worth exploring if there is interest in pursuing this concept for Broad Street.



Roundabout Concept at South/Hill/Broad

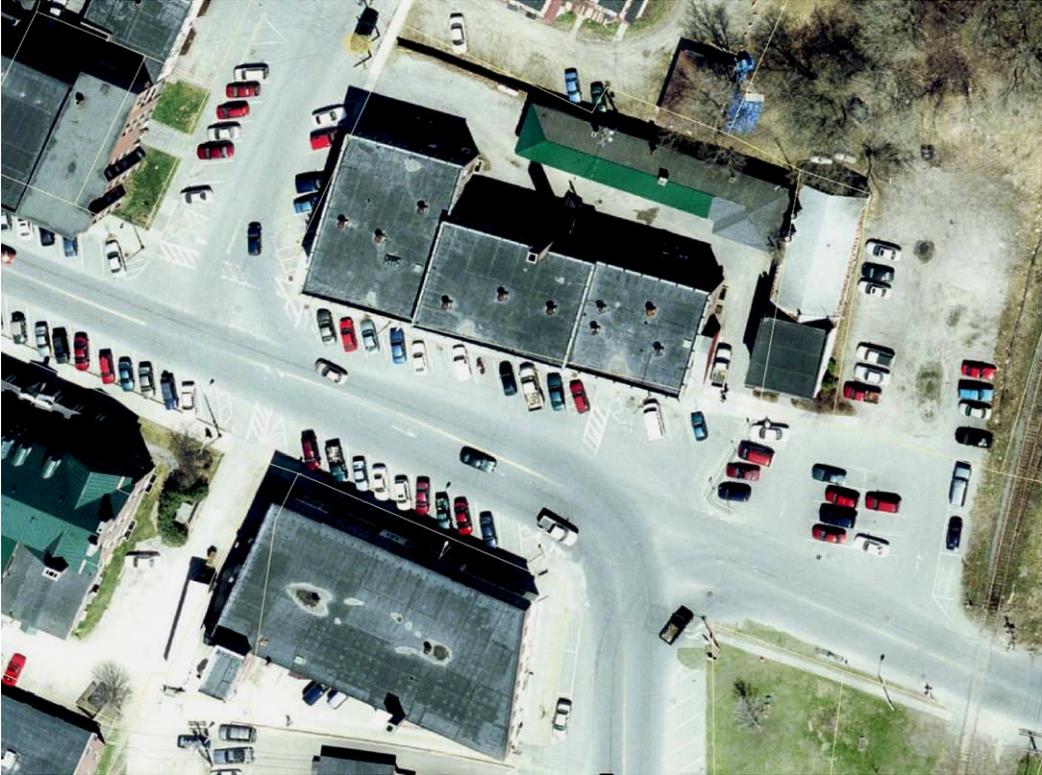


A concept for a roundabout at Hill/South and Broad Streets is shown to the left. A roundabout at this location would reduce traffic speeds entering the core of Lyndonville, which would increase safety for both vehicles and pedestrians. It could also be designed as an attractive gateway feature. A further advantage is that it will allow for “U-turns” for traffic on Broad Street, which may have difficulty making left turns onto Broad Street. The example below shows a 100 feet diameter roundabout, which meets the “urban” design guidelines. It could be designed to allow trucks, by appropriately sizing the approaches and central landscaped diameter. Roundabouts are the safest type of intersection control, and at this location, should result in a substantial reduction in crashes.

Design Options for Downtown Lyndonville

There was strong support, both from the public input received during this project, and in the Lyndon Town Plan, for growth in activity and vitality in downtown Lyndonville. The village has many characteristics that will serve it well as a stage for growth, including attractive historic architecture, ample parking, a good sidewalk network, and the presence of numerous active businesses. However, there is vacant space in the downtown, and room for more activity that could reinforce the village’s role as the economic and social center of the community. Many of the zoning changes that are recommended later in this report would support this role for Lyndonville. Below are examples of street design concepts that could reinforce an attractive, walkable village center. The following design concept would provide more pedestrian connectivity, better definition of parking, and wider sidewalks to allow for eating, sales, and other public activities.

Existing Conditions: Depot and Broad Streets



Possible Improvements to Define Pedestrian and Parking Areas, Widen Sidewalks



Route 122

This road provides an important alternate route for traffic coming from towns north of Lyndon and accessing I-91. Its use as an alternate route could be encouraged by road improvements that would improve travel time and safety. The benefits of this project would include reduced truck traffic in downtown Lyndonville.

Route 114

Scenic beauty is a great asset, but little protection offered by current zoning. Development pressure, and pressure to re-zone to commercial, could be intense, based on experience on the “Mountain Roads” of other ski resorts (Killington, Stowe, Stratton . . .) The section later in this report on recommended zoning changes provides suggestions for allowing growth while preserving the scenic character of this route.

Bicycling conditions were also of concern, which are far from ideal, with narrow shoulders and high volumes of large trucks. There is an opportunity to “stitch together” a bicycle route of primarily unpaved town highways, to connect East Burke and the ski resort to Lyndonville. This would provide both a unique recreation opportunity and a way for potential patrons of downtown businesses to arrive without a car, and therefore not require a parking space.

Multimodal and Management Strategies Tools

The following sections describe a variety of tools and strategies that may be useful to address the goals of the corridor management plan.

Travel Demand Management

While the Lyndon corridor area does not experience severe traffic congestion there are brief periods of the day, primarily during shift changes at the industrial parks that would benefit from a coordinated program of shift staggering. This can be implemented at relatively low cost, and could be incorporated into land use permits or implemented through voluntary outreach to local industries.

Public Transit

Current service is limited, but new service geared to Burke Mountain could be a great asset as the resort expands. The expansion of Burke Mountain could bring economic benefits to the community in many forms. Transit service could be planned as part of the development planning, and serve both employees and Burke Mountain guests who would like to come to Lyndonville.

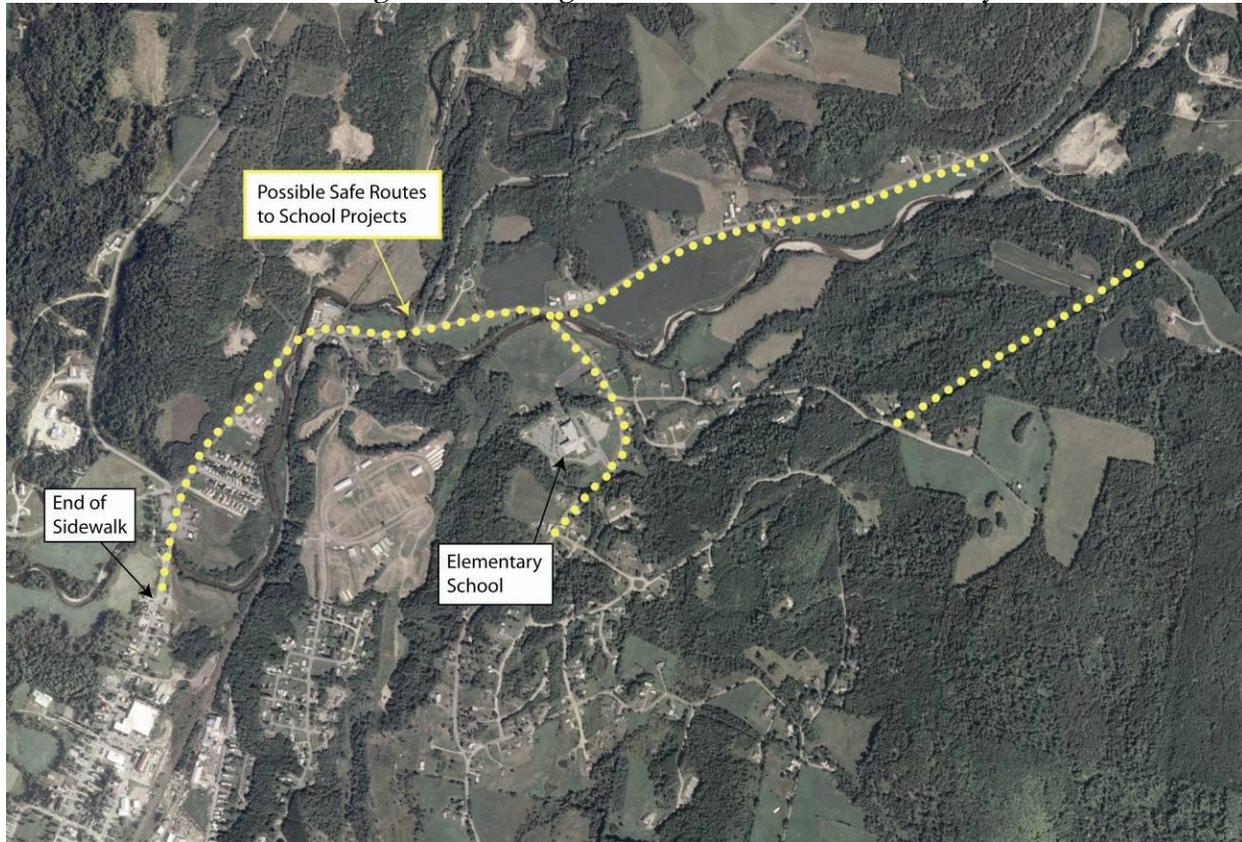
Potential new services include the GoVermont program, which provides statewide ride sharing services, and facilitates formation of vanpools. In addition, the regional transit provider, RCT, is planning to establish long distance commuting services between Newport and White River Junction.

Safe Routes to School

While the elementary school is geographically close to the population center in Lyndonville, it is difficult for students to access by bicycle or walking for the last half mile or so. Improvements that might include a sidewalk on Routes 5 and 114, and Lily Pond Road, would address the primary needs. In addition, a bicycle route along Route 114 to Burrington Bridge Road could provide access for children from neighborhoods to the east. This could also form a key component of a “back roads” bike route from East Burke to Lyndonville. Below is an illustration of locations where facilities for biking and/or walking to school would connect the

school to several nearby neighborhoods. VTrans offers a “Safe Routes to School” program, which provides for education, encouragement, and construction funding. Given the interest that was expressed in the public meetings, and the proximity of the school to the center of town, this program may have a lot to offer Lyndon.

Possible Locations for Walking and/or Biking Facilities to Serve the Elementary School



Land Use and Transportation

One of the most effective means for managing transportation issues in a community, region, or corridor is to manage the underlying land use patterns that generate the trips to be managed. It is for this reason that federal and state transportation policies and even the transportation funding bill (SAFETEA-LU) require transportation agencies to coordinate with local and regional land use planning agencies.

As indicated in the introductory material, the basic principles of supporting transportation management through land use and development are really quite simple:

- Concentrate the bulk of economic and residential activity in a compact pattern that reduces the need for single occupancy auto trips
- Mixed uses and short distances are easily served by walking and biking
- Dense development patterns are more readily served by transit

This type of land use pattern also serves to support the substantive goals of the Town Plan and Zoning Ordinance:

- provide for the orderly development of the Town of Lyndon;

- to preserve and conserve the natural environment within the Town of Lyndon;
- to mitigate the burden of property taxes on agricultural, forest and other open lands;
- to protect residential, agricultural and other areas from undue concentrations of population and buildings and overcrowding of land, from traffic congestion, and from the loss of peace, quiet and privacy that presently characterizes the town;
- to maintain the historic settlement pattern within the town, and to promote the growth of the town consistent with that traditional settlement pattern;
- to foster a strong and diverse economy providing satisfying and rewarding job opportunities and to expand economic opportunities within the town while at the same time maintaining high environmental standards;
- to maintain and enhance the recreational opportunities within the town;
- to encourage and strengthen agricultural and forest industries and related businesses; and
- to promote the availability of safe, sanitary, decent and affordable housing for all residents of the town. (Lyndon Town Plan, Final Draft, June 30, 2008, p.3)

The single most common tool communities use to bring about their desired land use future is their zoning ordinance. In Lyndon's case, this ordinance also incorporates the subdivision regulations, resulting in an effective unified development ordinance.

The primary functions of the zoning/development ordinance are to lay out the optimal arrangement of USES and their intensity or DENSITY in the community, located on a map. In addition, standards relating a number of key designs of performance issues such as site plans, parking, etc are prescribed to minimize the impact of development on neighbors, the environment, and community infrastructure and costs.

There are a variety of ways in which this process can be made more supportive of transportation management throughout the corridor that are discussed here. As in the case of the Town Plan, these recommendations have been keyed to and based on the existing zoning districts.

Development Pattern: Density

In shaping a pattern of use more easily served by the existing transportation infrastructure, Lyndon should institute a range of allowable residential densities that supports greater pedestrian and potential transit access. Based on existing zoning districts with minor modifications (see uses section below) modify the allowable densities as follows:

1. In the village/downtown itself (districts Village Commercial (VC), Main, and Park): provide for densities that are capable of supporting some level of transit service as well as a high level of pedestrian and general economic activity. A good rule of thumb density threshold required for transit service is about 12 du/ac. Also, modify development limitations in the Park district to:

- permit additions to structures, and/or additional structures if architecturally compatible, and
- delete limitations on total number of units relative to historical numbers

2. It is common for a village setting to be supported by an essentially contiguous area of lower, but still village-density, housing. One approach to addressing this would be to carefully define the adjacent area to the village (generally from about 1/4 to 1/2 mi). As a practical matter it is reasonable to think of the "neighborhood residential" district (RNH) in these terms. Thus, it is recommended that this zone (RNH) be modified to

permit densities more typical of village residential areas, i.e. roughly 6 du/ac. This district should also be expanded to include those parcels currently zoned commercial that staff has identified for residential development.

3. While intensifying densities in the core areas of Lyndon is important from a transportation management point of view, so is reducing densities in the outlying areas. Both because of the large areas involved and their remoteness from existing services (see *Future Trends for the Lyndon Area Corridors* analysis) extensive trip generation in the currently rural areas of town will have a major negative effect on travel and congestion management, in addition to the obvious impacts on the scenic and working landscape resources cited in the Town Plan. This area is defined by the “rural residential” (RR) district.

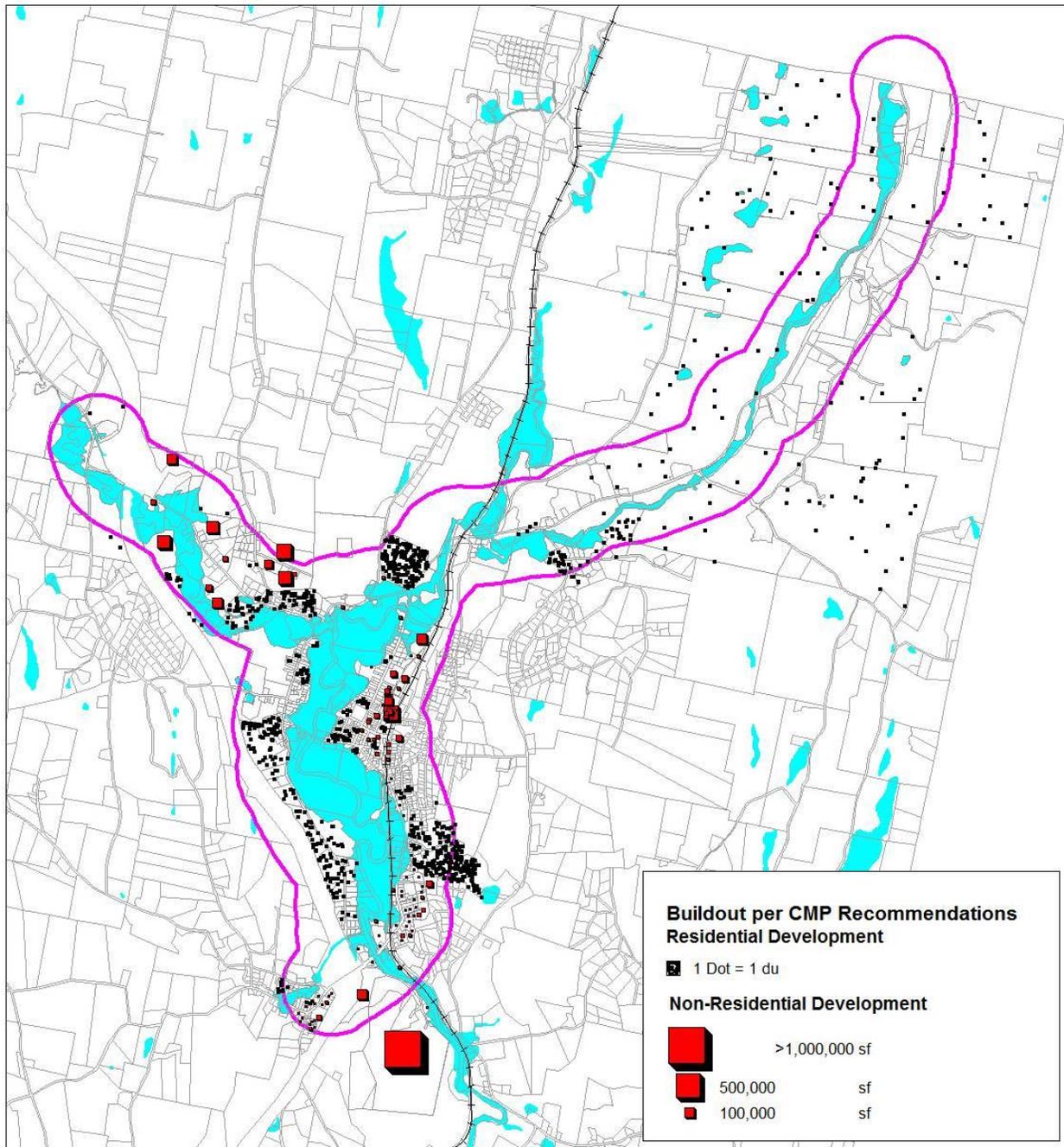
Based on this premise, an appropriate rural density should be established for this district. In Vermont, this would typically be one unit per 10 ac. Although this is still too dense for farming and silviculture as a fundamentally economic activity, it is compatible with those signature uses of the “working landscape”. Most importantly, from a transportation point of view, this would have the effect of reducing additional trips in the Rt 114 sub-corridor from nearly 20,000 per day to about 2,000, a level of trip generation far more likely to be manageable within the parameters of the existing roadway system. When implementing much larger lot based densities such as recommended here, it is also appropriate to modify other dimensional provisions as well, especially frontage. A frontage requirement of about 300 feet is appropriate for a 10 acre parcel. This not only results in reasonably shaped parcels (preventing the “airplane runway” lots sometimes encountered in low density situations) but also helps to control the proliferation of driveways along public roads. Three hundred feet is not excessive, corresponding to an intersection sight distance compatible with less than 30 mph, and even a stopping sight distance corresponding only to about 40 mph.

As an additional density support for the village oriented districts, it is also recommended that multi-family residences be eliminated as a conditional use, further focusing that activity in the RNH and village zones.

Also, even in the rural areas, it makes sense from a transportation point of view to create nodes of development, rather than spread everything out evenly over the countryside. In addition to the conventional planning and development goals of preserving more land for open space and larger scale rural resource based economic activity (farming and forestry) and locating actual development on the portions of land most suited to support it, nodal development in rural areas supports non-auto based transportation alternatives on both a formal (local transit and/or jitney service), and ad hoc (walking within neighborhoods, convenient carpooling) basis. Thus, it is recommended that all subdivisions or three or more lots within the rural area be developed under the cluster (PUD) provisions of the ordinance to the extent possible.

4. Mobile home parks, where permitted, should be limited to the density of the underlying district. This will serve to maintain densities suitable for servicing by the existing transportation infrastructure. Also, while the actual developed portions of a mobile home park are typically much more dense than conventional development, it will be possible to achieve this through the clustering provisions of the ordinance without so severely impacting the overall capacity of the system to support it.

In addition to the basic development pattern recommendations, two options have come to light over the course of developing this corridor management plan: transferrable development rights (TDR) and a satellite center north of the existing village center on or near Rt 114.



5. Option: Transferrable Development Rights (TDR)

TDR is a mechanism by which land can be developed at a much lower density than once envisioned while preserving much or all of the profit potential for the existing land owner(s). Since this reduction in profit potential associated with lower densities is often a serious objection to lower densities, it can assist in their implementation from at least a political point of view.

While a full discussion of this concept is not possible within the scope of this section, some simple explanation may be of assistance.

TDR is based on the long standing “bundle of rights” concept of property employed in all real estate markets. Thus, attached to any given property, there is a “bundle” of rights, including, among others, the right to occupy and to “quiet enjoyment”, to exclude others, to minerals below and other resources, including woodlands, above, and the right to develop. These rights are quite separable and are, indeed, often sold separately (much to the chagrined discovery of many western property owners who have discovered that the rights to drill for gas and/or oil on their property had already been sold to someone else before they bought it). Although most of us are more used to buying property with few rights otherwise encumbered (although most of us who do own property probably do have “easements” on it for, eg, power lines or other utilities) it is fairly common to separate at least some of these rights on many properties.

The basic idea behind TDR is that the development rights to a property can be sold separately from the physical property itself. And while a permissible development intensity may be established by zoning, a separate stock of development rights may also be associated with that property that differs from this permissible intensity. Thus, while in a rural area, a property owner may be permitted to develop only, say, one house per ten acres, he/she may possess development rights for, say, anywhere from 3 to 5 houses (or equivalent non-residential density). By the same token, an owner may possess a lot permitted for six houses in a more intensive district in town, but only enough development rights to build three of them. Thus, a market is created in development rights. The more intensive development will need three development rights from the owner who has 2 to 4 extra but can't use them at that location.

Although this sounds complex, it is actually quite simple and is commonly encountered wherever parcel accumulation occurs in the course of a development project (i.e more than one parcel is required to build a desired project). Such a system avoids a lot of complexities like a “development rights bank” that typically sink TDR systems. It also preserves value in rural property through the operation of the development rights market.

There is one significant disadvantage, however. The success of both TDR systems and of most community development strategies, including the ideas put forth in this corridor management plan, rely much less on the preservation of rural lands, than on the successful development of in-town areas, including intensification, in-fill, etc. By incorporating some, modest, impediment to that development, TDR can slow or impede it, rather than foster it.

Ultimately, if a TDR approach should be pursued, it will need to be understood on a community-wide basis since it will involve rural properties well beyond the study corridor. Plus, it will involve decision making and community planning beyond the scope of that addressed here. However, if fully understood, it does offer a potentially useful tool for implementing community development goals and could help support the transportation management strategies of this corridor management plan.

6. Option: Satellite Village Center

Heretofore, the vast majority of additional development intensity has been presumed to occur roughly within the confines of the existing village and nearby commercial and residential areas. As a result of public input, the possibility of developing an entirely new satellite village center generally served by Rt 114 in the vicinity of the school/fairground was raised. This type of approach offers a number of advantages, including that it will more easily support additional development in the Rt 114 sub-corridor, it could be conceived and developed to take advantage of its proximity to both the school and fairground, and it could be designed without the

limitations of the existing development in the village center area. It also has at least one significant potential disadvantage in that it would also siphon off economic and civic activity and vitality from the existing village. In any case, this is clearly a much larger question than a purely corridor management issue, involving fundamental questions of how the community sees itself developing overall and the level of economic and residential activity it envisions supporting over what period of time. As such, it will require extensive planning beyond current corridor study to integrate with existing community infrastructure and plans.

Development Pattern: Uses

As in the case of development densities, the basic principle of supporting corridor transportation management is to provide for high levels of economic and civic activity within a compact, easily served area (the village area in this case), while reducing transportation pressures in outlying areas. This is supported in the following ways:

- locate personal convenience based activities as well as business services that can easily benefit from direct personal contact within the village core
- many uses, such as Post Office, municipal offices, etc will generate spin off activities such as convenience shopping, meals, etc; locate these in the village core
- mix uses including office, convenience, and high density residential to provide synergistic support for each other; locate civic, cultural, and special events activities in the village core
- locate highway oriented uses including industrial and large scale commercial uses (eg lumber yard) in outlying, highway oriented areas, preferably easily accessible from an interchange
- manage uses to minimize direct competition between the highway/outlying uses, and the village core area to minimize destructive interference between them.

In general, these uses, in conjunction with their associated densities, establish the “context zones” discussed earlier that are the basis for the context sensitive transportation solutions to corridor issues.

Several specific actions relative to uses in the zoning ordinance are recommended.

1. Clarify/rationalize uses: As discussed in PM#1 a great deal of “noise” has apparently crept in to the uses established under the Lyndon zoning over the years. It will be an essential part of both the zoning for this corridor management plan, as well as for community development goals overall, to clarify and rationalize the uses supported by zoning. From a corridor management point of view, this is true especially as they apply to context zones: urban/village; highway oriented; village residential; rural, etc.

Obviously, it will be impossible to fully address uses until this is resolved throughout town. This will require more input than corridor transportation studies, including overall development goals, other infrastructure capacities (sewer, water, general government, recreation facilities, education, etc.). To the extent that use issues are related to the corridor management effort, they will be mentioned in the sections below. However, at least two “overall” use issues with possible corridor management implications were noted in PM#1:

- the reliance on a “catchall” use without adequate definition nor standards should be eliminated, and
- industrial (I) uses currently include two uses: "junk yard" and "bulk storage of dangerous materials" that are of dubious value, potential harm, and, in the case of “bulk storage of dangerous materials” appears to directly violate separate performance standards.

In addition, several specific use provisions are directly applicable to corridor management issues.

2. Substitute planned unit development (PUD) for current planned residential development (PRD) This modification was also cited in the Land Works analysis of zoning conducted as part of the Burke Mountain Transportation Infrastructure study. In addition to bringing the existing ordinance in conformance with VSA chapter 117, the PUD provides additional advantages in that it provides for mixing uses on a single site. To the extent that this is appropriately implemented, it will reduce the off-site/auto oriented travel necessary to service the included uses. In addition, it has been recommended above that PUD be required in rural districts for subdivisions into 3 or more lots.

3. Village zones (village commercial (VC), Park, and Main) Promoting and generally supporting compatible economic and civic activity in the village areas is a cornerstone of this corridor management plan. Much of this is intended to be achieved through the density provisions discussed above. However, a number of improvements to the use structure are indicated. These are based on the principles: 1. provide compact uses that support a high level of economic and civic activity, especially at the street level, 2. reduce/limit incompatible uses that inhibit village activity or make it unattractive, and 3. ameliorate, to the extent feasible, opportunities for destructive interference from other near-by uses and activities. Some specifics under this rubric:

- substitute hotel/inn use for "transient lodging" which includes highway oriented "motel" in village zones; include B&B
- restaurants and entertainment are already supported, and should continue to be; potential addition of café with outdoor seating.
- add Post Office and public/municipal use(s); limit to village (VC)
- explicitly provide for mixed uses on same parcel (village zones) based on the general (but not inviolable principle of ground floor: retail/services, above: office/residential (mf)
- in addition, current permitted uses include a number of uses that are largely incompatible with a high level of street level pedestrian activity due to one or more of the following properties: high auto access requirement, especially with concomitant low pedestrian attractiveness, large space consumption, also especially with low pedestrian attractiveness, and/or potentially noxious or otherwise unattractive use, that should be rezoned to other more highway oriented district(s), including:
 - car wash
 - drive-in restaurant
 - fuel distribution
 - motor vehicle repairs
 - auto service station
 - warehouse (as primary use; except auxiliary to other retail/commercial)

4. Neighborhood Residential (RNH) In addition to the density modifications recommended above, a few modifications to the uses supported in the RNH district would both enhance its role as residential support for the village area, as well as modernize its implementation:

- provide for single family attached/townhouse development, and
- as indicated previously, rezone the areas of sewered commercial, primarily along Rt 122 to RNH, per staff assessment of appropriate future development

5. Rural Residential (RR): Besides the density modifications plus the general clarification/rationalization indicated above, few modifications to the use structure of the rural residential district are indicated, and possibly none are required. Mostly these represent questions relative to the need and/or auto access requirements for certain uses, and/or their compatibility with the rural/residential working landscape envisioned under these recommendations:

- why is “light industry” included here? (although, given the extreme limitations on this use, it is likely so inconsequential, it almost doesn't matter, it could still result in some incompatible conditions)
- why is “medical clinic” included; not only is this use generally at odds with an open farming landscape, it is better suited to a village location both in support of the village, and to permit easy access to medical services on the part of elderly or other persons with limited mobility that may need to use them. It is possible, however, to define a veterinary clinic/hospital that might be both compatible and useful in a more rural setting

6. Interchanges: Development potential in the vicinity of interstate interchanges has a large potential to transform any community. Although the requisite development pressures have not yet manifested, Lyndon, with two interchanges (I-91, exits 23 and 24) is particularly subject to this situation. The properties in the vicinity of these interchanges are currently zoned "commercial" (exit 23), and "industrial/commercial" (exit 24). Large areas of commercial development potential lie outside the study corridor proper, and even within it, there is potential in excess of 1 million square feet. (By way of illustration, 1M sq ft of shopping center type development would typically generate about 30,000 trips per day all by itself. Even in the vicinity of an interchange, this would transform the entire area, as well as compete directly with village and other community businesses.) This likely far exceeds the needs of the community, even without the additional, unstudied potential. Both interchanges need to be reconsidered within the total development posture of the town. In general, and in conjunction with the larger town planning effort, it is recommended that:

- the current I/C zoning at exit 24 is wide open and should be redefined to something more like industrial; alternatively, develop a "business" zone that would support a business park, but not extensive commercial/retail
- exit 23 contains enormous development potential including much outside the purview of this study; it needs to be reconsidered within the total economic development posture of the town likely modifying significant portions of the commercial zone, especially south and east of the interchange (outside the immediate corridor properties) to less commercial orientation

7. Principles of Use Competition Management: As indicated, the appropriate management of competitive uses with downtown activities is a significant ingredient of the corridor management strategy. In general, competition is a good thing, and is one component of delivering superior goods and services to the public at better cost. However, all of us have experienced circumstances under which the competition becomes destructive and results in shifting costs onto the public and impairing critical community functions. The goal is to support the types of uses in compact, walkable areas that are compatible with that sort of structure, and highway oriented activities in that environment. For example, no one is going to carry their new sofa home from the furniture store in their backpack, nor do they need to gas up their bicycle at the service station, so it makes little sense to locate these types of uses downtown. On the other hand, if a proliferation of gas/convenience stores on the highway makes it impossible to provide these services in town that will interfere with the ability of the village to support the other activities that only make sense there.

It will be impossible, especially before the clarification/rationalization process referred to above, to fully address how these uses should be pieced together to create an integrated, well functioning whole. However, certain principles of optimizing this sort of competitive environment may be helpful:

- convenience retail, personal services: focus in/limit to village
- limit office uses in highway oriented districts to "office/business park" type uses
- focus services (eg bank, Post Office, government buildings) in village
- although, mobility oriented uses should be focused in highway oriented zones (eg much commercial), care should be taken to limit direct competition with downtown supportive uses; thus, for example, banks with drive through windows should be located in the village rather than in outlying areas.

8. Option: rezone in-town industrial area to support more village oriented uses if industries should convert. There is a significant area of industrial use in industrial zoning in the North Main Street area. While this is a valuable resource, in-town industries are not typical, modern phenomena. While any future zone should facilitate the continuation of these industries as long as they remain economically viable, it would also make sense to provide for their orderly conversion to village oriented uses at some time in the future. While a corridor issue, this will need further work with both owners/operators and the community as a whole to implement.

Transport Supportive Zoning

In addition to the basic functions of establishing the use and density pattern, zoning typically addresses a number of additional parameters that can help to support (or conversely, hinder) good transportation management principles and practice. Several of those are addressed here and recommended for adoption.

Pedestrian/Bicycle Support: The importance of pedestrian and other non-vehicular access can not be overstated in managing a community's transportation environment. Not only are they important means of access themselves within any compact village setting, but they form the basis for future transit service as density and overall development level grow. In addition to the direct provision of sidewalks and/or trails as well as a range of pedestrian amenities throughout RNH and village zones as discussed elsewhere in this plan, zoning provisions can facilitate the provision of appropriate facilities as the future development process unfolds. Two specific provisions recommended for adoption include:

- modify the site plan review procedures and criteria to provide for direct pedestrian access to all buildings and uses from street without crossing parking areas, and
- modify the subdivision regulations to provide for pedestrian and bicycle facilities (sidewalk(s), bike lanes, multi-use paths) for all subdivisions of parcels into 3+ lots

Access Management: The formal practice of access management is a key ingredient in preserving roadway and corridor functionality as development occurs. Many of its principles can be implemented through the community zoning ordinance. It is recommended that the Lyndon zoning site plan review provisions be modified to provide for:

- access limited to one driveway per parcel except where physically separated parking lots that cannot be joined require up to one additional access; combine lots for access purposes where in single use/ownership
- driveways (adjacent parcels) to be consolidated wherever feasible
- parking lots on adjacent properties to be connected wherever feasible

- access to property via secondary road (not on main/through road) wherever available
- generally, conformance with latest edition of VTrans "Access Management Guidelines"
- access only via a driveway conforming to VTrans B-71 standard; no open access along frontage
- specifically require adequate intersection sight distance (ISD) for non-residential driveways supporting 75 or more peak hour movements

Parking: As has been noted throughout this study process, parking is a critical resource for a community, particularly in support of its commercial and business sectors. However, as important as parking is, it is not without its costs. Too much, or badly designed parking can sap an area, particularly a compact village core, of the vitality and street level activity that is its life blood. It can interfere with the pedestrian and potential transit access that otherwise support traffic and congestion mitigation throughout a transportation corridor.

Parking is subject to zoning and, as such, can be shaped to provide optimum support for both village and highway oriented development. Provisions should be included in the parking section of zoning that address:

- Design/layout of parking facilities; this should include:
 - no parking in required front setback
 - no parking between building face and street
 - appropriate lighting and landscaping standards
- Required parking standards (number of spaces):
 - permit/require shared parking computations wherever feasible
 - option: eliminate minimum parking requirement in village, altogether; manage through pricing should that point ever be reached
 - option: reduced/minimum standard parking requirements: this should be based on actual survey and analysis of existing conditions/demand patterns rather than any arbitrary external values
- Provide for bicycle parking as well as vehicular through zoning parking standards

In addition, although existing parking is more than adequate for present village uses, this corridor plan envisions a significant expansion of downtown activity in the future. If this occurs, parking may become tight, indicating additional space, especially for employee and long term parking. The area immediately to the north of existing parking adjacent to the railroad represents an ideal location for this. It is recommended that the community pursue securing this area for future parking. Exactly how large a portion of it is appropriate should be addressed in a formal parking study and plan.

Addendum

Build-out Analysis: Methodology

The basic method for conducting the build-out analysis has been to apply the requirements of zoning on a parcel-by-parcel basis to the properties located in the analysis corridor, including natural features, and existing development and other cultural properties. This has been conducted as a geographic information system (GIS) analysis. For those unfamiliar with this type of analysis, the basic building blocks of GIS are called “layers” and represent the geographically referenced maps along with the information associated with them (eg, the parcel map including the grand list information referenced to each parcel).

Prepare parcel layers for analysis

Because this has been a parcel based analysis, the basic layer has been the Lyndon parcel map. From this, it has been necessary to provide for updates to the linked information for each parcel, and to identify which parcels constitute the corridor analysis area. This has entailed the following steps:

1. Prepare the original Town supplied parcel data layer to incorporate information about the applicable zoning, sewer and water service, and area (acreage) of sub-parcels that will be created when the parcel layer is combined with additional data (zoning and natural features/limitations)
2. Create layers for sewer and water service areas from utilities location map(s), update parcel based sewer and water service from service area maps
3. Based on the corridor definition, identify parcels for analysis. The initial subset of parcels for inclusion in the analysis corridor was based on a 1/4 mile buffer around the key corridor roadways: US 5, and VT 114 and 122. This 1/4 mile buffer was reviewed both within the oversight committee and with regional and local staff. Any parcel intersecting (with any portion inside) this buffer was included. This subset of parcels was modified by:
 - a) adding parcels either 1) having direct access predominantly via corridor roads (eg Mt Hunger), and 2) comprising the scenic area west of Darling Hill Road both because of the direct visual access to the corridor and potential direct actual access across the Passumpsic east branch, and because of the serious visual impact that development in this area would have, and
 - b) subtracting parcels either 1) with other major access options via routes not involving major corridor roadways, and 2) beyond barriers, e.g. I-91 and RR.
4. At this phase, existing non-residential square footages on corridor parcels were also updated from Listers' data, since these data were not included in the basic parcel data layer.

Analyze zoning districts as applied to corridor parcels

A critical step in this process is to determine exactly how the controlling zoning regulations will be applied to individual parcels. Because Lyndon zoning applies separate zoning requirements to separate portions of the same parcel where zoning district boundaries cut existing parcels, a sub-parcel data set was created from the intersection of the initial corridor parcel data set and zoning.

This new layer of corridor parcels was refined to eliminate the new sub-parcels that would not be a factor in corridor development, including: 1) sub-parcels consisting entirely of water based on zoning designations, 2) “sliver parcels” that are too small to be developed effectively, nor will contribute significantly to overall

corridor development levels (these have been taken to be those of <0.1 ac based on smallest zone min lot size: C = 4,000 sf), and 3) parcels without parcel identifier (typically RR parcels). Zoning and sewer and water service availability on these new new sub-parcels has been updated from the zoning, and sewer and water service area layers.

Manually review and correct anomalous parcels and apparent errors in the database

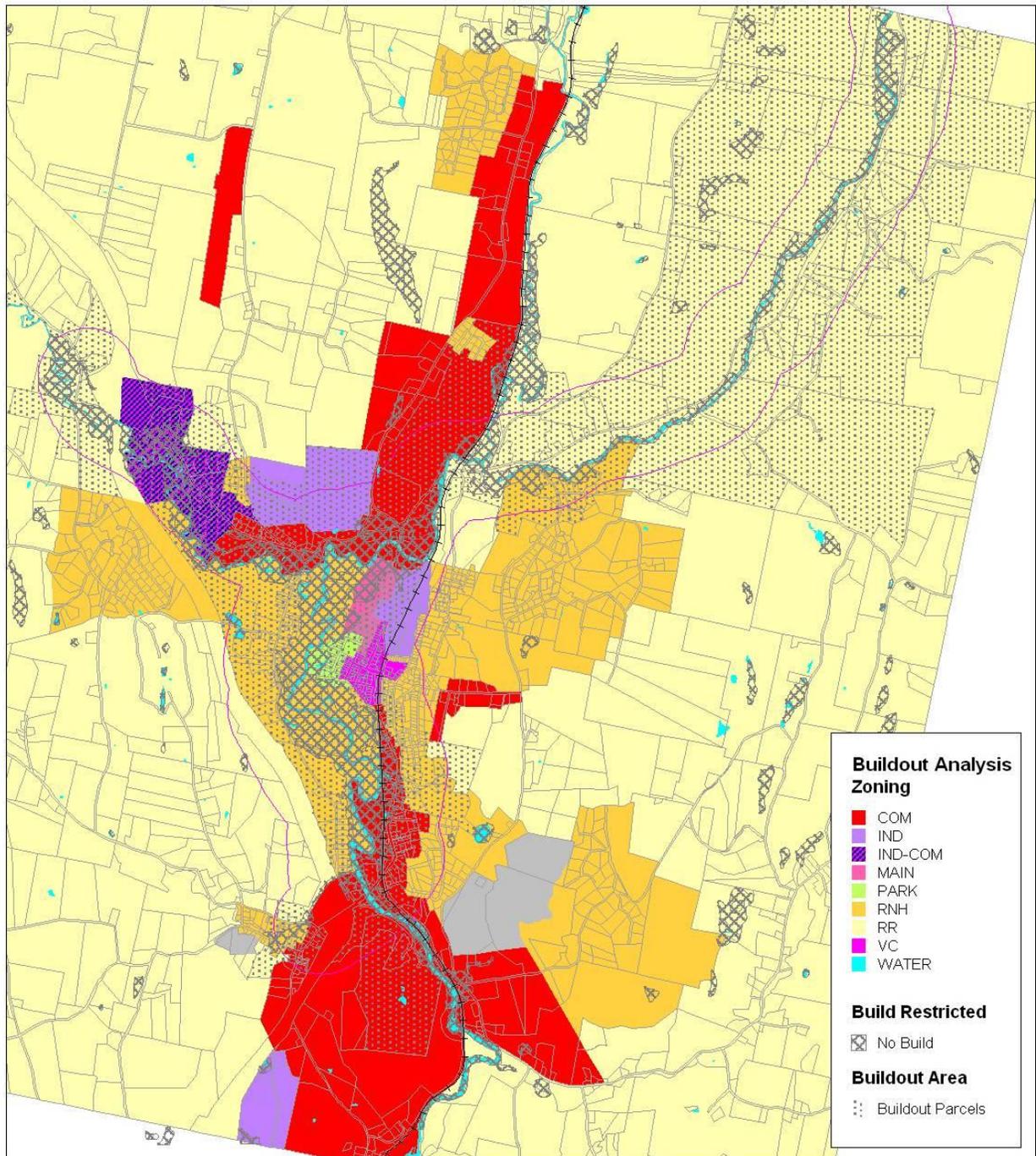
Some internal errors were found in the parcel database, including:

- a. clearly incorrect acreages: although, initially a significant number of parcels were manually corrected, ultimately, the internal GIS polygon areas were used in the analysis due to a very high number of anomalous acreages found in the database;
- b. parcels split by roads: these were included in the parcel data base twice with duplicate data; these were combined and data folded into a single entry

Analyze land deemed “undevelopable” under zoning

In analyzing overall development potential, it is always necessary to remove some land from consideration due to existing natural features. For the purpose of this analysis, this has been taken to be based on PRD criteria. Based on these regulations, undevelopable portions of lots/parcels include: 100 year flood plain (developed from FEMA), wetlands identified by the National Wetlands Inventory (NWI), and slopes in excess of 1:1 (100%)(however, no naturally occurring soil map unit exists in Lyndon that has "slope high" characteristic > 1:1, so as a practical matter, no area of this is mapped).

Figure 6 Build-out analysis factors



This composite “undevelopable” layer has been combined with the corridor sub-parcels derived from the zoning analysis to assess the developable area on each corridor parcel.

Publicly owned parcels were removed from the analysis based on a list of such parcels provided by the Listers.

Allocate development to parcels based on zoning densities based on zoning

Once developable parcels and portions of parcels and the zoning controlling their development have been identified, it is a fairly straightforward process to allocate development to them based on that zoning. This process has applied somewhat different criteria in residential vs non-residentially zoned areas.

Non-residential areas

In keeping with the general trend in non-residential development in non-metropolitan areas everywhere, all development of this type has been assumed to be "greenfield" development (i.e. development only on parcels with no existing use/vacant). That is except in the Broad Street sub-corridor where intensification to limits of zoning and conversion are assumed to take place. In this crucial sub-corridor, special "Broad Street rules" apply, including:

- intensification/conversion of existing uses on existing parcels to limits of zoning for non-residential and single family uses (i.e. single family uses are assumed to convert to non-residential), and
- multi-family (i.e. apartments) uses are assumed to intensify as multi-family to the limits of zoning, i.e. not to convert to commercial

Development densities/intensities have been allocated on the basis of the information and analysis presented in the table: "Non-residential Development Intensity Under Zoning" and accompanying discussion in the *Existing Conditions-Lyndon Area Corridor Management Plan* section above.

In addition, staff identified a number of parcels that were commercially zoned and sewered (mostly along VT-122) that were deemed to be most likely to develop as intensive multi-family parcels. These have been analyzed in this fashion.

Residential areas

The basic process used for developing residential areas is subdivision. Because of this, even if a parcel already supports some development, it is both reasonable and likely that it could be subdivided at some time in the future to support additional residential development. For that reason, this process has been assumed to be followed with the development of additional residential units.

In keeping with the approach taken in the PRD section of the zoning, residential densities have been assigned based on zoning and utilities service categories as discussed in the table: "Dwelling Units/Acre" and accompanying discussion in the *Existing Conditions-Lyndon Area Corridor Management Plan* section above. They include a subdivision deduction of 15% for roads and lotting inefficiencies, etc.

The resulting development densities/intensities used in this analysis are shown below in Table 2, the actual development allocation table used in the analysis.

Table 2. Development Allocation by Zone and Class

Zoning Classification	Residential Units per Acre	Non-residential Square Feet	Minimum Lot Size
COM1	2.47	8,712	0.69
COM2	0	8,712	0.69
COM3	0	8,712	0.69
IND1	0	10,890	1

IND2	0	10,890	2
IND3	0	10,890	3
IND-COM1	0	10,890	0.69
IND-COM2	0	10,890	0.69
IND-COM3	0	10,890	0.69
MAIN1	0	1,353	0.23
PARK1	5	0	0.195
RNH1	2.96	0	0.46
RNH2	1.48	0	0.57
RNH3	1.06	0	0.8
RR1	1.85	0	0.46
RR2	1.48	0	0.57
RR3	0.93	0	0.92
VC1	0	87,120	0.092

In the area of town not supported by one or both municipal utilities (sewer, water) an analysis was undertaken to determine how State on-site water and sewer requirements might affect lot size and development densities. The results of this analysis showed:

- the rural residential lot size of 1 ac was adequate to support the requisite 100' well isolation distance from leach fields, the single largest requirement,
- septic leaching conditions on soils suited for on-site disposal (well, moderately, marginally suited) showed no leach requirements large enough to affect lot size even remotely, and
- visual inspection of unsewered parcels for unsuitable septic soils (class 4 & 5) showed negligible reduction in development potential due to unsuitable soils.