



DRAFT REPORT FOR PUBLIC REVIEW

Lyndon Area Corridor Management Plan



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LYNDON AREA CORRIDOR MANAGEMENT PLAN

INTRODUCTION

"Growth is inevitable and desirable, but destruction of community character is not.
The question is not whether your part of the world is going to change.
The question is how." -- Edward T. McMahon, The Conservation Fund

The process of developing and implementing a Corridor Management Plan (CMP) is emerging as one of the most effective strategies to maintain and enhance our roadway network. The following excerpt from the Vermont Corridor Management Handbook summarizes the benefits of a CMP.

The Benefits of Corridor Management

Why undertake a corridor management plan effort?

- To identify and address transportation deficiencies before they turn into critical problems that can affect quality of life and limit economic development;
- To allow for development of coordinated transportation and land use solutions along a corridor – a far more effective approach than individual piecemeal initiatives that may act at cross-purposes;
- To bring diverse stakeholders together (local, regional, and state agencies, property owners, and others) and agree on mutually beneficial strategies as well as ongoing mechanisms for cooperatively pursuing these strategies;
- To save money by implementing non-capital intensive strategies (such as operational improvements, access management, or land use policies) as an alternative to expensive transportation capital investments;
- To develop creative strategies for supporting sustainable economic development in corridor communities; and
- To ensure that transportation needs are addressed in a manner that preserves and enhances Vermont's natural environment and the unique character of its communities.

The goal of a Corridor Management Plan process is to assure that differing goals at the local and state levels regarding transportation and land use do not result in wasted money or unsatisfactory project outcomes.

About this plan

This plan presents a wide range of possible actions that could be taken by the Town of Lyndon, Northeast Vermont Development Association (NVDA), and/or the Vermont Agency of Transportation (VTrans). We are recommending these strategies for further consideration based upon our findings in this planning process. Not all of these elements are likely to be implemented, but they represent a wide array of options to address some of the key emerging transportation challenges that will be faced by Lyndon in the corridor area. These options should be considered a “menu”, that the Town can consider as it undertakes planning efforts in the future. Some of these recommendations can begin immediately, and may be relatively easy to accomplish. Others will undoubtedly take more time before they are acted upon, and may in the end not be pursued for implementation by the town. However, it is hoped that this plan will spur local discussion on how best the Town of Lyndon can work with its partners at NVDA and VTrans to assure that our road network remains safe, efficient, and affordable.

This plan is structured so that this first section describes key findings and recommendations. Following this is a section that describes some of the more unusual or innovative suggestions in more detail, as well as a description of an implementation strategy. The remaining sections present background information on existing and future conditions, which formed a basis for the recommendations. Appendices include notes from meetings and public workshops.

The plan is organized with Volume 1 including the key findings and recommendations, and implementation plan, and Volume 2 including the background documentation on existing and future conditions, as well as a broad description of possible strategies and tools.

CORRIDOR MANAGEMENT PLAN FINDINGS AND RECOMMENDATIONS

A wide range of possible transportation and land use options for effective corridor management were reviewed in the process of preparing this plan. The findings and recommendations that follow are grouped by transportation infrastructure management and land use tools.

Transportation Elements

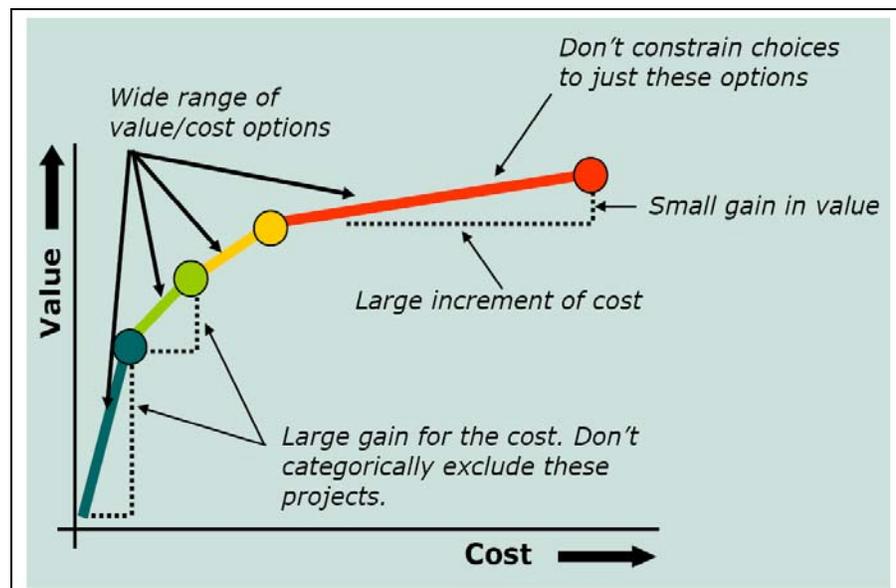
The following sections describe the findings and recommendations for the primary transportation infrastructure in the corridor.

Broad Street

VTrans has the reconstruction of Broad Street on its list of candidate projects. However, the project at this time has not advanced beyond very conceptual plans. Funding for transportation capital improvements is diminishing both at the national and state levels. Providing for cost effective transportation improvements is more important than ever. No further engineering work has been conducted recently, although some funding is available for the FY09 period. The project limits are essentially between the two railroad crossings of Broad Street. The current plans include full roadway reconstruction and widening to three lanes for much of the project length. The project includes a traffic signal at Red Village Road. Input received through this CMP process indicated that many residents feel that this project may be over-designed for the needs, and that the length of the left turn lane be excessive. It is therefore appropriate to reconsider the scope of this project, to

determine if there are opportunities to reduce the scale and cost of the project, which should allow it to be funded, designed and constructed more quickly.

The graphic to the right shows an idealized relationship between cost and value of transportation projects, with the recommendation of selecting alternatives that offer the most value per dollar. When reviewing actual project design alternatives, it is often not possible to develop these types of mathematical relationships, but the goal of selecting the most cost effective alternative should never the less be a goal.



Source: NJDOT/PennDOT Guide to Smart Transportation, Figure I.3¹

The planning process indicated that there is an opportunity to re-consider the Broad Street project currently still in the early project development stages at VTrans, with the goal of reducing costs, but still maintaining “Value” in terms of meeting the primary project objectives.

Based on input received from the public at the workshop held July, 2008, as well as a meeting with the VTrans project development staff in August, 2008, the following changes to the scope or design of the Broad Street project are recommended for consideration. The goal of these changes is to reduce the overall cost of the project, and target the improvements on the aspects of the roadway that are of most concern to the residents to drive to and through the corridor on a daily basis.

- The two way left turn lane does not need to be as long or extensive. Target left turn lanes to areas that have the higher traffic volume generators, and eliminate the third lane in other sections. This will likely eliminate the need for full reconstruction of the roadway, as the concrete road base is sufficient for a two lane road. Where widening does occur, the concrete base can be extended. The following figures compare the extent of the left turn lane provided in the current VTrans plans, with a more limited left turn lane option.

¹ Smart Transportation Guidebook- *Planning and Designing Highways and Streets that Support Sustainable and Livable Communities*, New Jersey Department of Transportation, Pennsylvania Department of Transportation, March 2008.

Left Turn Configurations for VTrans Project and Proposed Modification

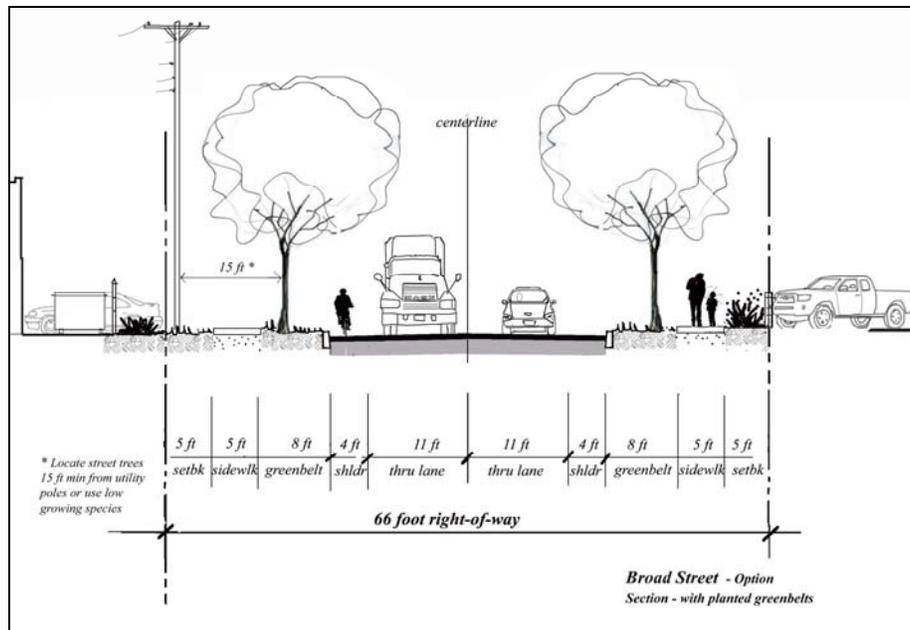
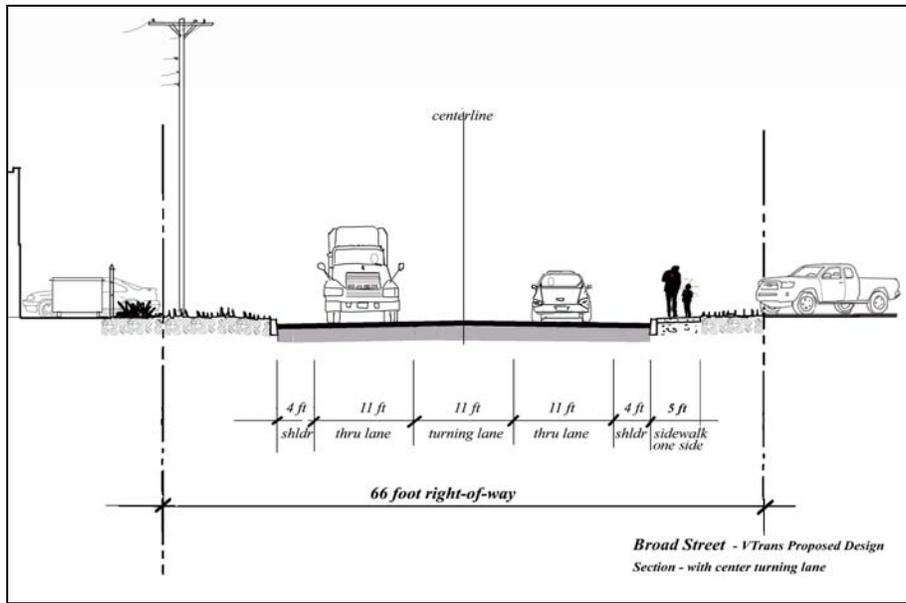
VTrans Project Plans



Possible Modifications



- The cross section should be modified as shown below to provide a greenbelt between the edge of Broad Street and a sidewalk. The first figure below shows the current VTrans cross section of Broad Street, and below that is a proposed change, which includes two travel lanes, greenbelts and sidewalks. Sidewalks are shown on both sides of the road, in order to illustrate that there is room within the right-of-way. However, it is likely that initially, a sidewalk would be constructed only on one side. The greenbelt is an important feature of this cross section for several reasons. It provides a place for trees, which create a more attractive street as well as contribute to a traffic calming effect. The greenbelt also provides a space for snow storage, which is a problem when the sidewalk is immediately adjacent to the street. Finally, it creates a far safer and more comfortable environment for pedestrians.



- Extend the project length north to include the intersection of Hill St/South St, as this is a site of frequent accidents due to sight distance constraints. Several alternatives for the Hill Street/South Street/Broad Street intersection to address safety and capacity concerns are shown below.

<p>Existing Conditions</p>	<p>Tighten the corner radii at Hill/Broad, in order to improve visibility for Hill Street traffic</p>	<p>Roundabout intersection will provide more than enough capacity, as well fully address safety concerns.</p>

- Apply innovative storm water treatment to the Broad Street Project. There is growing interest in using natural storm water treatment systems that are integrated with the landscaping along a street. This could be particularly beneficial for the Broad Street project, as one of the challenges during the preliminary design was to secure a location for stormwater treatment. By providing a more decentralized treatment approach, the green strips along the street serve multiple purposes (protect pedestrians from traffic, provide a place for snow storage, and storm water treatment). Below are some examples of the types of systems that could be used along Broad Street, and possibly in some of the parking areas.

<p>Cuts through the curbing allow water to flow into an area that is designed to absorb and treat stormwater</p>	<p>Alternative system in which water is collected, and infiltrates the soil under the “greenbelt” area of the street</p>

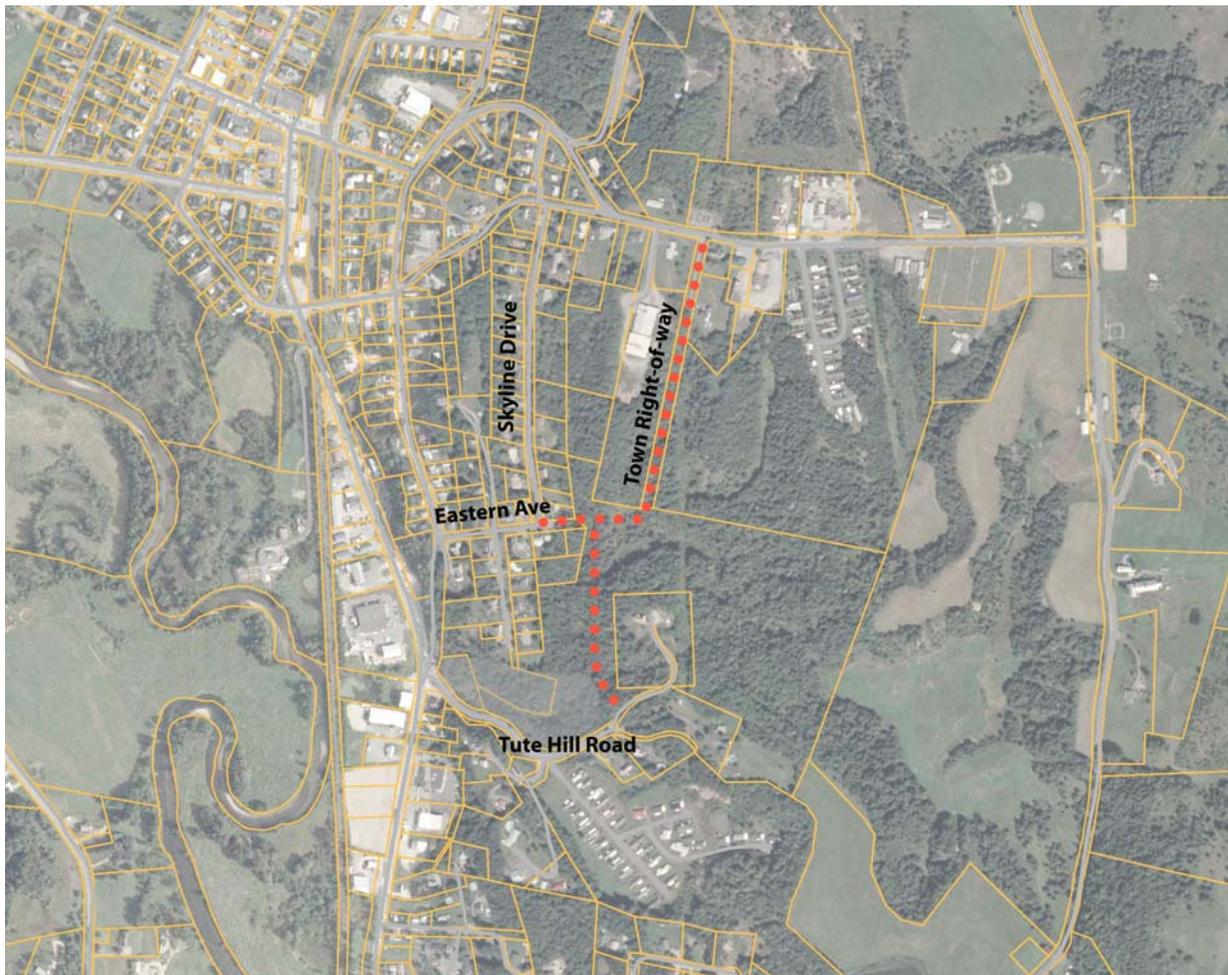
Red Village Road Intersection

The VTrans Broad Street Project includes signalization of the Red Village Road intersection. This will likely require some right-of-way acquisition at the intersection corners, but is not expected to displace any uses.

Charles Street Circulation Options

The one-way portion of Charles Street results in an inconvenience for residents of that neighborhood area. However, restoring the southernmost portion of Charles Street to two-way traffic safely would require a substantial investment. Several options are worth considering for this area:

- Improve Charles Street and Broad Street intersection for safe, two way operation (high cost)
- Close the southern end of Charles Street (low cost, but puts more traffic onto Hill Street, which has unsafe sight distance. (low cost, but should only be considered after Hill St/Broad St intersection is reconfigured to address safety concerns.)
- Develop an alternate route between Eastern Avenue/Skyline Drive and Tute Hill Road. This could also connect with the town right-of-way that connects to Hill Street (see figure below). This would require a substantial investment, and would only make sense if it was coordinated with a development plan for the area, and there was consensus between the landowner and the Town of Lyndon about the desirable level of development activity. Due to the proximity of this neighborhood to the services along Broad Street and in Lyndonville, it may be an appropriate place to encourage growth, and could be considered in a public planning process.



Route 114 Corridor

This corridor is rural and scenic, and experiences little in the way of congestion, and relatively few serious accidents. Primary concerns related to this corridor through the planning process included:

- Bicycling conditions are poor, with heavy truck traffic and narrow shoulders.
- Route 114 could see significant development pressure as Burke Mountain grows, and could become the “Mountain Road” of the ski area. This would change the character of the area significantly, and could detract from the vitality of downtown Lyndonville.

A build-out analysis that is described in the attached volume shows that current zoning allows for nearly 2,000 additional housing units on lands abutting the Route 114 corridor study area, compared about 100 existing homes. Traffic from this growth would cause at least a five-fold increase in daily traffic volumes. While this growth may be unrealistic in total, the high allowable densities could result in dramatic changes to portions of the corridor. In response to these concerns, the following actions could be considered:

- Develop access management policies, so that Route 114 does not become cluttered with unconnected driveways, leading to safety and congestion issues, as well as a change in the road’s character.
- Consider land development policies that encourage development in way that is less visually obtrusive, and preserves some of the outstanding features, such as the open fields along the river, that contribute to the road’s outstanding scenery.
- Undertake a conceptual alignment study for bicycle transportation along the corridor. This could include adding shoulders to Route 114, or connecting several local roads that parallel Route 114 to form a “back-roads” bicycle route between East Burke and Lyndonville.
- Maintain rural residential character for the corridor, so that commercial uses are maintained in Lyndonville (and East Burke).

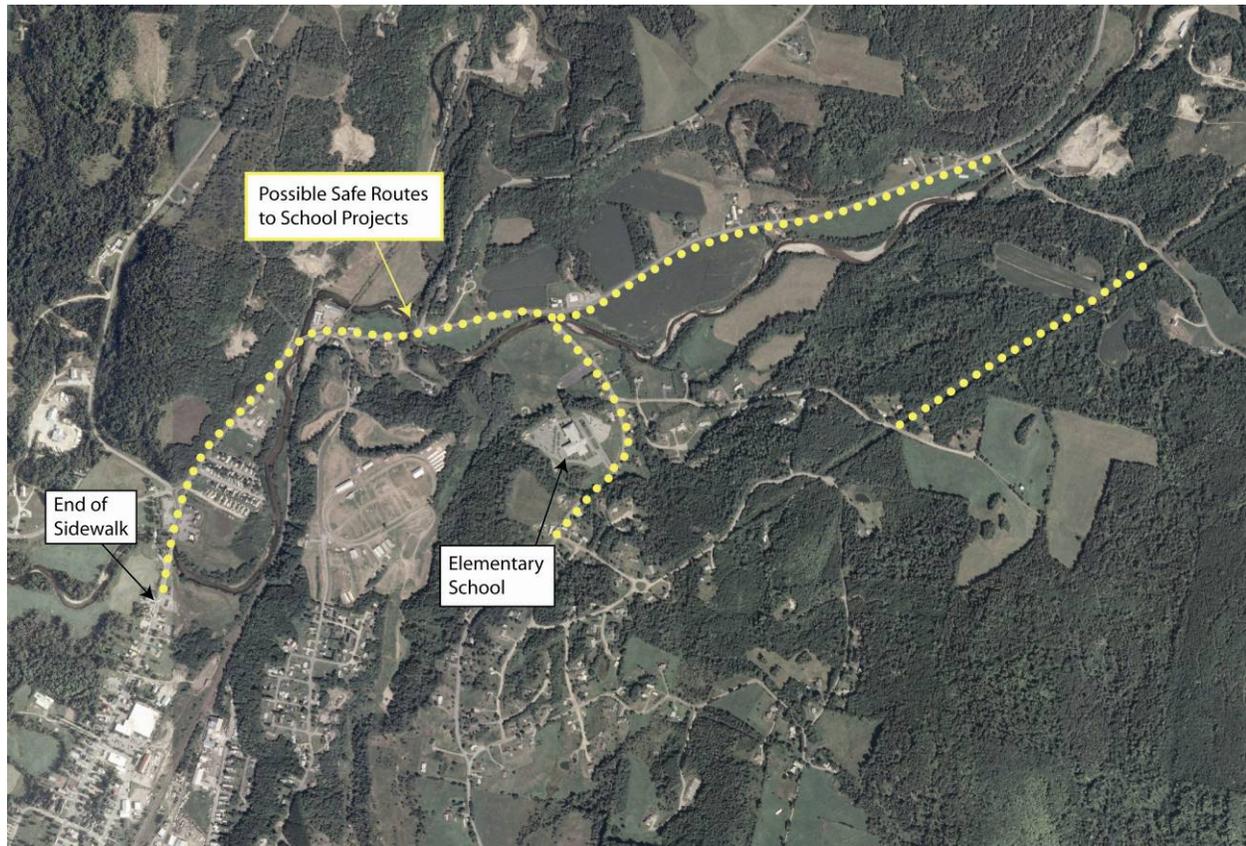
Route 122 Corridor

This corridor could potentially serve as an alternate truck route, which would be particularly effective if the weight limits on I-91 were raised to 99,000 pounds. There is interest in this issue across Vermont, as both New Hampshire and New York have higher weight limits for interstate highways. While designation Route 122 as a truck route would benefit Lyndonville by diverting trucks outside the village, it would also require substantial improvement to Route 122, which is currently not adequate to support heavy trucks. Developing Route 122 as a truck route could be combined with a plan to encourage more industrial uses at I-91 Exit 24.

Safe Route 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 to address this might include a sidewalk on Routes 5 and 114, and Lily Pond Road. 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 component of a “back roads” bike route from East Burke to Lyndonville. On the following page is an illustration of locations where facilities for biking and/or walking to school could 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



Downtown Improvement Options – Depot Street

Several strategies recommended in this report focus on strengthening the downtown. Zoning changes, if enacted, would allow more people to live in or near the downtown; road improvements would provide an enhanced and safer walking and biking environment; improved transit facilities would make downtown a destination; and more business growth would lead to a livelier downtown Lyndonville. Improving Depot Street's infrastructure would reinforce all of these strategies and goals.

The Depot Street right-of-way between Broad and Main Streets is very wide, ranging from approximately 70 feet at the west to about 100 ft at its intersection with Broad. This wide right-of-way was likely established during the days of horse and wagon, where the broad expanse was used by the clutch of farmers bringing their products to the train depot. They needed the ½ acre to park and turn their rigs.

Today most of this generous right-of-way remains paved and dedicated to vehicular lanes or parking. Although the pedestrian sidewalks on Depot are sufficient by most standards, opportunities exist to shift the balance for use of the right-of-way toward pedestrians, as well as for downtown commercial priorities, which include attracting shoppers. There is ample room to improve the sidewalk and pedestrian infrastructure, improve pedestrian comfort and safety and generally create a better setting for businesses in the town center. Such improvement can be accomplished without compromising vehicular circulation or diminishing the total number of parking spaces.

The wide right-of-way benefits the downtown by allowing angled parking spaces that support Depot Street businesses. Another Depot Street amenity is its underground utility service that keeps the street free of visual clutter.

The plan shown in this report is one option for clarifying vehicular circulation, organizing parking and improving both pedestrian facilities and pedestrian visibility. Conflicts are reduced and safety is improved when pedestrian ways, vehicle routes and parking areas are clearly defined in this way. The following are key components of this plan:

- The parking lot parallel to the railroad track is now lightly used but could provide a needed, expanded parking resource as downtown businesses grow. The plan defines this lot and the pedestrian routes to and through it. Trees could be added to the green space. Future expansion of this lot as municipal parking might be considered.

- The sidewalks are enlarged at intersections to define the parking areas, shorten the pedestrian crossing distance and most importantly allow the pedestrians to stand closer to the traveled way to better see and be seen by on-coming vehicles when they cross the street. These “curb extensions” make plowing more complex but increase pedestrian safety and comfort. They can be enhanced by planted green space as shown in this photo.



Curb Extension for mid-block crossing on Main Street in Saint Albans

- Added sidewalk space provides more than ample room for all the needed utility space for poles signs, hydrants, newspaper boxes etc plus room for street trees and in addition seasonal use of the walk by businesses. Although (and perhaps because) Vermont has a short summer season, outdoor uses and displays of products on the sidewalk are very popular. These opportunities may help some businesses strengthen their off-season volume in a winter tourist area.



Sidewalk sales bring shoppers downtown



Example of streetscape with street trees and outdoor seating²



Downtown Option: Streetscape Improvements could improve pedestrian safety, define parking, and support downtown businesses without infringing on vehicular circulation lanes.

² *Vermont's Scenic Landscapes: A Guide to Growth and Protection*, Vermont Agency of Natural Resources, 1995.

Transportation Management

There were observations on the part of the public that traffic congestion, particularly on Broad Street, was limited to a relatively short period of the day, coincident with shift changes at many of the businesses along the corridor and in the Industrial Park. This indicates that there may be an opportunity to establish a local organization to coordinate efforts such as shift staggering, ridesharing, vanpooling, and other means to both reduce the volume of peak hour traffic and provide for more convenient commuting. Many communities have established “Transportation Management Associations” (TMAs) to address this need. TMAs are non-profit, member-controlled organizations that provide transportation services in a particular area, such as a commercial district, college, medical center or industrial park. They are generally public-private partnerships, consisting of area businesses with local government support. These organizations are often coordinated at the regional level, and there may be role for NVDA in this effort. Among the activities they can support include:

- Coordinated schedule management and flextime to shift traffic away from peak hours
- Car and vanpool and other ridesharing support by matching rides even across employers and providing a “guaranteed ride home” for pool participants in case of emergency or unforeseen scheduling issues (eg needing to work late); coordinated programs for pooling support such as preferred parking, parking “cash out”, and program marketing and publicity. Car and vanpooling and other forms of ridesharing can significantly reduce demand on transportation facilities. TMAs can work with their private partners to develop and enhance park and ride facilities.
- Tourism and recreation transportation management: by supporting a wide range of ridesharing programs, and even sometimes coordinating the provision of shuttle services, access to important tourist and recreational destinations such as a ski area can be noticeably ameliorated.
- Parking management: TMAs provide the ideal vehicle for managing a parking resource that is often shared among numerous employers and businesses.
- Access management: although the bulk of the physical improvements associated with access management will be dealt with through the community government process, the unique public-private partnership provided by the TMA is an ideal environment for ironing out conflicting issues, and educating the participants on the need for, and techniques and benefits of access management.

Finally, a TMA is an ideal vehicle for carrying the chosen plan for corridor improvement beyond the time constraints of the study into actual implementation. TMA organizations and their effectiveness in other locations are discussed later in this report, in the “Special Topics” section.

Land Use, Growth and Development Policy

Federal and State transportation policies have increasingly emphasized the improved coordination of land use and transportation planning since the passage of ISTEA federal legislation in 1991. With every re-authorization of transportation funding, the requirements to coordinate transportation planning with land use planning have been strengthened. Transportation investments are most effective when they support and complement the land use vision and goals of a community.

During the process of preparing this Corridor Management Plan, it became clear that there is by no means consensus on the appropriate role of land use policies and regulations for the Town of Lyndon. During the steering committee and public meetings, some residents and landowners expressed their preference to see non-regulatory means of corridor management planning. One option for the town to consider is to revamp the zoning ordinance into a “Form –Based Code”, which is an entirely different approach to implementing

land use policies. This is discussed in detail in the “Special Topics” section of this plan. The following sections discuss some of the areas where Lyndon’s current land use policies may be at odds with the current and future transportation needs, and some types of changes could be considered.

Density

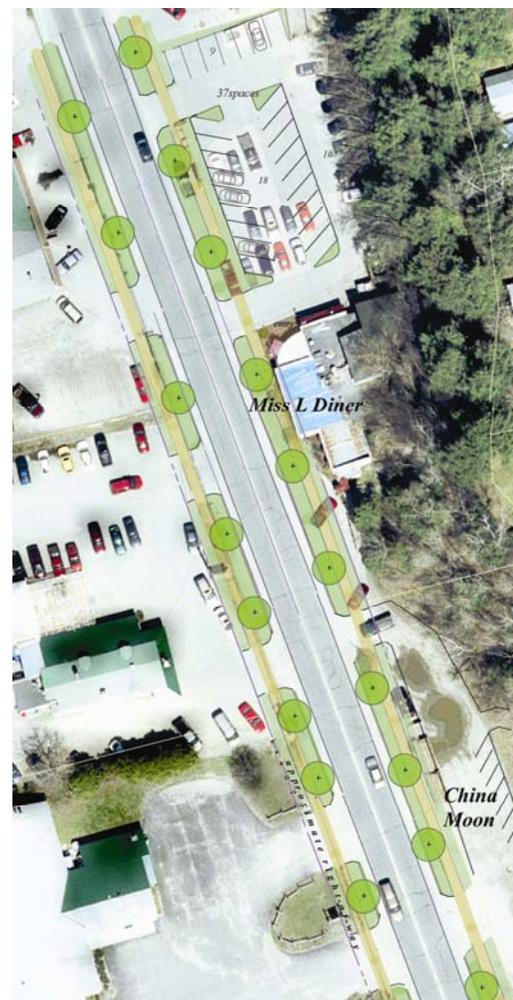
Lyndon’s current residential zoning densities are relatively uniform across the town. While full build-out of the allowable densities is unlikely to ever occur, this arrangement will result in a relatively dispersed pattern of settlement. The emerging needs of an aging population, which is the trend in Lyndon, would be better met by new housing units closer to Lyndonville. However, the current zoning densities allow very little growth in or near Lyndonville, but high numbers of new housing units in the more rural, remote parts of the corridor.

One of the primary concerns that has been expressed in regards to lowering the rural densities is the fairness to the rural landowners, who may be relying on their property value as a key component of their livelihood during retirement. This is a very legitimate concern, and there are some tools that communities around the country have used to address this. A primary tool that we recommend for consideration is the “Transfer of Development Rights” concept, which is described in more detail in the section on Special Topics.

Access Management

One of the primary reasons for the congestion and safety issues on Broad Street is the uncontrolled access throughout much of the corridor. This creates confusion and chaotic traffic situations, as oncoming drivers often cannot anticipate exactly where a vehicle entering a property will chose to turn. It also allows for very high speed turns, which lead to unsafe conditions for other drivers and pedestrians. This situation has evolved over decades of land development along the corridor that did not consider the cumulative effect of so much uncontrolled access on vehicles nor on pedestrians. VTrans has adopted access management policies when considering applications for new driveways. However, this only applies to new permits. These policies are not typically enforced retroactively on existing properties. With the Broad Street project still under development, there is an opportunity for the Town of Lyndon to facilitate progress on access management by working with some of the property owners along the corridor and to seek locations where some of the existing undefined curb cuts can be consolidated into a reasonable number.

The example to the right shows how access management could be implemented on a section of Broad Street near the Miss Lyndonville Diner. Rather than wide open, undefined entrances, curb cuts would be established so that there is a single driveway entrance to each property. This can be strengthened if adjacent sites are able to share driveways.



Internal connections between adjacent sites can result in further benefits to traffic on Broad Street. Every turn onto or off from Broad Street can potentially create conflicts, so all of these access management activities could result in smoother, safer traffic operations. Pedestrians are also beneficiaries of this types of design, as they have far less exposure to traffic.

Pedestrian and Transit Support

Land use policies could encourage or require new developments in areas in more potentially walkable areas to provide sidewalks, or perhaps contribute to a fund for their eventual construction. Funding to construct sidewalks after the fact will be increasingly scarce, so planning these facilities in where they are needed or envisioned would be proactive.

Land Use Designations

The current zoning provides for nearly any land use of any scale in the vicinity of I-91 Exit 24. This could result in a new, dispersed commercial center. As commercial uses that are frequented by residents become more dispersed throughout town, more travel is required to meet one's daily needs. There is a transportation advantage to maintaining commercial uses in a more focused area, so it may be appropriate to consider redefinition of the lands around I-91 Exit 24 for uses including industrial, and non-retail commercial, and small-scale retail to serve the immediate neighborhood.

IMPLEMENTATION

The following section describes key actions that could be taken by the Town of Lyndon, NVDA, and/or VTrans to implement each of the above recommendations.

Broad Street Project

Town: Request VTrans to reconsider the scope and design elements of this project as described in previous section.

NVDA: Coordinate re-design effort

VTrans: Conduct P.E. design over the next year with proposed modifications, recognizing that the narrower width could result in substantial cost savings by eliminating the need for full reconstruction.

Charles Street Circulation Options

Town: Consider three options presented in report, plus others that may emerge in discussion. If there is interest in considering a higher intensity growth area along the Tute Hill Road corridor, apply for funding through the Municipal Planning Grant program offered through the Vermont Department of Housing and Community Affairs to determine the feasibility and desirability of the growth and possible street connections.

NVDA: Support efforts to address this project within the Broad Street Project as appropriate.

VTrans: Develop conceptual designs and determine feasibility of improvements to the Tute Hill/Charles Intersection to restore Charles Street to two-way traffic.

Route 114 Corridor

Town: *Access Management*-Consider access management policies to be incorporated into zoning ordinance as it is re-written in the near future.

Bicycle Transportation-Apply for funds through the VTrans Bicycle and Pedestrian Program to consider conceptual alternatives for a bicycle route between East Burke and Lyndonville, considering both shoulders along Route 114 and development of a back-roads route.

NVDA: Coordinate efforts of Town and VTrans

VTrans: Consider adding shoulders to Route 114 during next paving project.

Safe Route to School

Town: Support the Elementary School in participation in the Safe Routes to School Program. The school must be the primary applicant, but town support is required for successful entry into this program. Once enrolled, consider improvements to the bicycle and pedestrian network that would enable safe travel to school by these modes.

NVDA: Coordinate efforts of Town and VTrans.

Downtown Improvement Options – Depot Street

Town: Apply for funding through the Municipal Planning Grant program or VTrans Enhancements Program to explore and design streetscape improvements for Lyndonville that would balance pedestrian and vehicular needs, and improve the business environment.

NVDA: Coordinate efforts of Town and VTrans.

Transportation Management

Town: Consider adopting language in zoning ordinance or Town Plan that would encourage coordination of schedules among the town's primary employers, in order to alleviate peak hour traffic congestion.

NVDA: Establish a working group of major employers as a forum to discuss possible shift coordination, improvements in ridesharing and transit, and other issues of concern that relate to commuting.

VTrans: Provide information on GoVermont programs and vanpool assistance.

Density

Town: Consider altering development density in order to allow more concentration in and near the village, and reducing the density in rural areas. This could be accomplished by several means, including establishing a policy that encourages transferable development rights as a means to provide more equity for rural landowners.

NVDA: Provide technical support to town as needed and appropriate.

Access management

Town: Consider adding language in the Town Plan or zoning ordinance that encourages or requires more coordination with adjacent site driveways, and keeps new access points from state highway to a minimum.

NVDA: Provide technical support to town as needed and appropriate.

VTrans: Implement VTrans access management policies when reviewing applications for new access points.

Pedestrian and Transit Support

Town: Consider adding language to zoning ordinance that encourages or requires developments in areas that likely to see pedestrian activity to include pedestrian facilities in their site planning as appropriate.

NVDA: Provide technical support to town as needed and appropriate.

SPECIAL TOPICS

Form Based Codes

In the discussions with the public and steering committee that have led to the development of this plan, it is clear that there is not consensus within the Lyndon community that zoning is desirable or effective. In fact, one need only look at Lyndonville to see a very harmonious, attractive village center, which was developed in an era before zoning was a reality. In recent years there has been a small but growing movement away from conventional zoning toward an alternative concept known as "form based codes". This is largely in recognition of many of the weaknesses and deficiencies of conventional zoning, including its separation of uses and the resultant traffic generation. It is also an attempt to re-institute historical town building practices, where each new building was designed to be in harmony with the form and scale of the neighboring buildings as much as possible, with the result being very attractive, balanced streets and neighborhoods.



The basic philosophy of a form based code is to shape the form of the buildings and development, especially the public spaces defined by streets and other access ways, rather than to try to rigidly regulate the uses that may occur. The conceptual underpinning is that, while uses may change, the buildings and development endure and shape community life for decades to come. Since form based codes specifically strive to relate development to community infrastructure, especially transportation, they are often defined in relationship to the "transect" system used in context sensitive solutions/design (CSS/CSD) that was discussed early in this project.

One need only travel through many of Vermont’s historic towns and villages, as shown in the above photos, to see that the form of development, which was not the result of zoning, but rather a philosophy of building that considered the overall harmony of form, has created desirable, timeless places that are still attractive and functional. Form-based codes strive to provide the guidance to create these kinds of places, which has been somewhat forgotten in the past decades of auto-oriented development, in which sites and buildings were designed primarily for the user rather than for the overall community.

A form-based code is generally more based on pictures, with little specification about “uses” that are either allowed or prohibited. The figures shown below to the right are examples of how different context areas are defined (T1 through T6), and how graphics are used heavily in the form based codes to illustrate appropriate building types that will result in the community as envisioned.

Form-based codes place a primary emphasis on building type, dimensions, parking location and façade features, and less emphasis on uses.

They stress the appearance of the streetscape, or public realm, over long lists of different use types. These codes have the following characteristics:

< Zoning Districts – Form-based codes are defined around districts, neighborhoods and corridors where conventional zoning districts may bear no relationship to the transportation framework or the larger area.

< Regulatory Focus – Form-based codes de-emphasize density and use regulation in favor of rules for building form. They recognize that uses may change over time, but the building will endure.

< Uses – Form-based codes emphasize mixed use and a mix of housing types to bring destinations into close proximity to housing and provide housing choices to meet many individuals’ needs at different times in their lives.

< Design – Greater attention is given to streetscape and the design of the public realm, and the role of individual buildings in shaping the public realm. Form-based codes recognize how critical these public spaces are to defining and creating a “place.”

< Public Participation – A design-focused public participation process is essential to assure thorough discussion of land use issues as the code is created. This helps reduce conflict, misunderstanding and the need for hearings as individual projects are reviewed.

Source: California Local Government Commission pamphlet Form Based Codes: Implementing Smart Growth

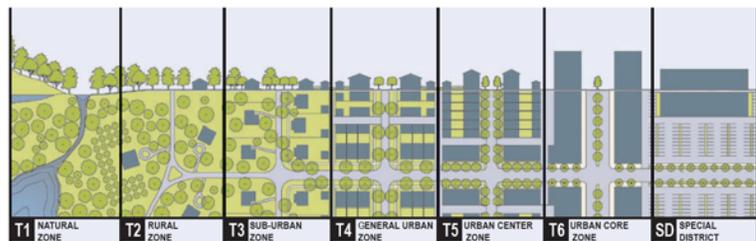


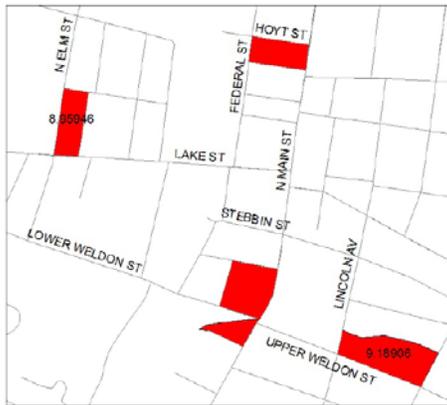
TABLE 7: Private Frontages. The Private Frontage is the area between the building Facades and the Lot lines.

	SECTION	PLAN
	LOT PRIVATE FRONTAGE	LOT PRIVATE FRONTAGE
	R.O.W. PUBLIC FRONTAGE	R.O.W. PUBLIC FRONTAGE
a. Common Yard: a planted Frontage wherein the Facade is set back substantially from the Frontage Line. The front yard created remains unfenced and is visually continuous with adjacent yards, supporting a common landscape. The deep Setback provides a buffer from the higher speed Thoroughfares.		
b. Porch & Fence: a planted Frontage wherein the Facade is set back from the Frontage Line with an attached porch permitted to Encroach. A fence at the Frontage Line maintains street spatial definition. Porches shall be no less than 8 feet deep.		
c. Terrace or Lightwell: a Frontage wherein the Facade is set back from the Frontage line by an elevated terrace or a sunken Lightwell. This type buffers Residential use from urban Sidewalks and removes the private yard from public Encroachment. Terraces are suitable for conversion to outdoor cafes. Syn: Dooryard.		
d. Forecourt: a Frontage wherein a portion of the Facade is close to the Frontage Line and the central portion is set back. The Forecourt created is suitable for vehicular drop-offs. This type should be allocated in conjunction with other Frontage types. Large trees within the Forecourts may overhang the Sidewalk.		
e. Stoop: a Frontage wherein the Facade is aligned close to the Frontage Line with the first Story elevated from the Sidewalk sufficiently to secure privacy for the windows. The entrance is usually an exterior stair and landing. This type is recommended for ground-floor Residential use.		
f. Shopfront: a Frontage wherein the Facade is aligned close to the Frontage Line with the building entrance at Sidewalk grade. This type is conventional for Retail use. It has a substantial glazing on the Sidewalk level and an awning that should overlap the Sidewalk to within 2 feet of the Curb. Syn: Retail Frontage.		
g. Gallery: a Frontage wherein the Facade is aligned close to the Frontage line with an attached cantilevered shed or a lightweight colonnade overlapping the Sidewalk. This type is conventional for Retail use. The Gallery shall be no less than 10 feet wide and should overlap the Sidewalk to within 2 feet of the Curb.		
h. Arcade: a colonnade supporting habitable space that overlaps the Sidewalk, while the Facade at Sidewalk level remains at or behind the Frontage Line. This type is conventional for Retail use. The Arcade shall be no less than 12 feet wide and should overlap the Sidewalk to within 2 feet of the Curb. See Table 8.		

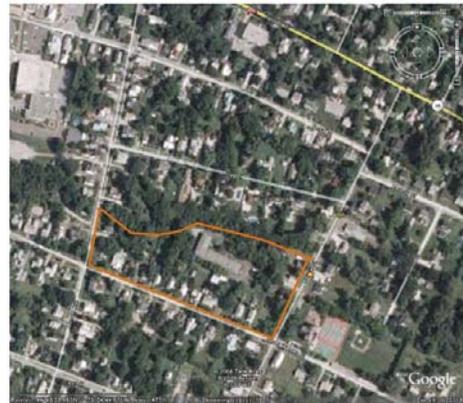
Density

One of the recommendations of this study is to increase allowable density in village core areas. Although the precise density target should be defined by the community after a public planning process, a residential density of 12 units per acre is suggested based on rule-of thumb transit thresholds (ie, 12 units per acre is fairly broadly considered the threshold density to support regular, frequent bus service).

Although densities in this range are not widespread in Vermont, they do occur at numerous locations in village centers, and are not limited to large cities. Examples are presented from Saint Johnsbury and Saint Albans. Densities were surveyed from US Census 2000 block data. The densities illustrated below are about 9 units per acre in St Albans, and about 8.5 units per acre in St Johnsbury.



St Albans High Density Blocks



St Albans Weldon/Lincoln Block



St Albans N Elm St Block



Saint Albans Weldon/Lincoln Block



St Johnsbury High Density Blocks



St Johnsbury High Density Housing

Transportation Management Association (TMA)

Transportation Management Associations (TMAs) are non-profit, member-controlled organizations that provide transportation services in a particular area, such as a commercial district, college, medical center or industrial park. They are generally public-private partnerships, consisting of area businesses with local government support. Transportation Management Coordinators (TMC) are professionals who work for TMAs or individual employers. TMAs provide an institutional framework for Transportation Demand Management (TDM) programs and services. They are usually more cost effective than programs managed by individual businesses. TMAs allow small employers to provide commute trip reduction services comparable to those offered by large companies. They avoid problems that may be associated with government-run TDM programs, since they are controlled by members.

How it is Implemented

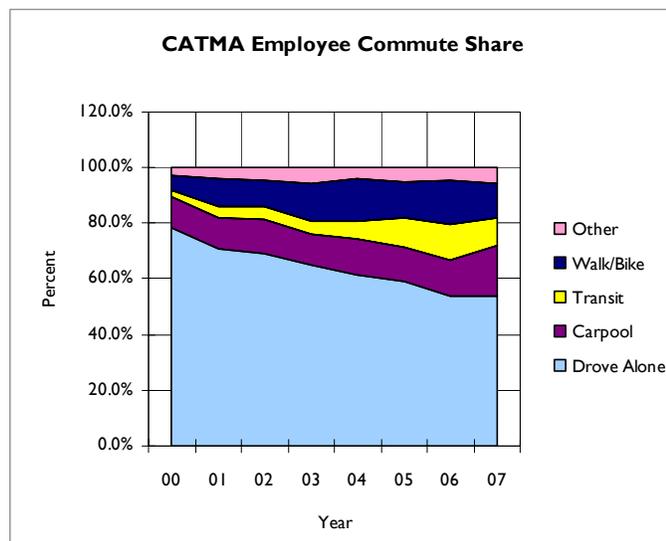
Regional or local governments, chambers of commerce or management of a major facility (such as a mall or hospital) can help create a TMA and provide seed funding. Developers or facility managers may be required to establish a TMA to mitigate local congestion and parking problems. TMAs are typically funded through dues paid by member businesses and government grants.

CATMA

By far the largest, most established, and most successful TMA in Vermont is the Campus Area Transportation Management Association (CATMA). Formed as a joint effort of UVM, Champlain College, Fletcher Allen Health Care, and the American Red Cross, CATMA manages the significant parking and traffic issues of the “hill institutions” and supports alternatives to “drive alone” commuting, that is common elsewhere throughout Vermont. Its success at this is attested by the graph to the right.

Transportation Management Associations can provide a variety of services that encourage more efficient use of transportation and parking resources.

- Access Management
- Commuter Financial Incentives
- Flextime Support
- Guaranteed Ride Home Services
- Marketing and Promotion
- Parking Management and Brokerage
- Pedestrian and Bicycle Planning
- Rideshare Matching and Vanpool Coordination
- Shuttle Services
- Special Event Transport Management
- Tourist Transport Management
- Transit Improvements
- Transportation Access Guides



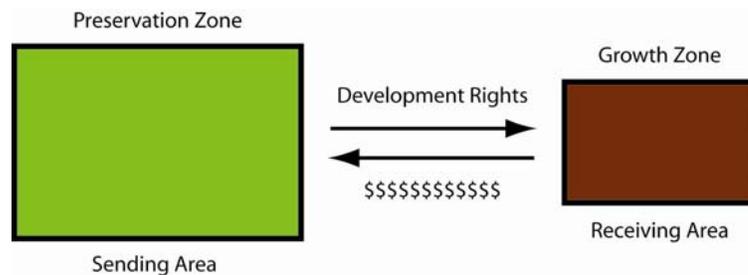
Data courtesy CATMA

Transferable Development Rights (TDR)

TDR is the exchange of zoning privileges from areas with low population, such as farmland, to areas of high population, such as downtown or village areas. These transfers allow for the preservation of open spaces and historic landmarks, while giving urban areas the opportunity to expand and experience continued growth³. Transfer of Development Rights (TDR) programs use market forces to simultaneously promote conservation in high value natural, agricultural, and open space areas while encouraging smart growth in developed and developing sections of a community. Successful TDR programs have been in place throughout the country since 1980, and have protected tens of thousands of acres of farmland and open space.

Description

In a TDR program, a community identifies an area within its boundaries which it would like to see protected from development (the sending zone) and another area where the community desires more dense development (the receiving zone). Landowners in the sending zone are



allocated a number of development credits which can be sold to developers. In return for selling their development credits, the landowner in the sending zone agrees to place a permanent conservation easement on his or her land. Meanwhile, the purchaser of the development credits can apply them to develop at a higher density than otherwise allowed on property within the receiving zone.

Considerations

TDR programs have the advantage of using free market mechanisms to create the funding needed to protect valuable farmland, natural areas, and other open space. However, TDR programs can be complex to administer, requiring the local unit of government to make a strong commitment to administering a potentially complicated program and educating its citizens and potential developers. TDR programs must be combined with strong comprehensive planning and local controls in order to be successful.

Where It Is Working

Montgomery County, Maryland, near fast growing Washington, D.C., established its TDR program in 1980. By the end of fiscal year 1997, the TDR program had protected 39,180 acres (out of a total sending area of 89,000 acres). Prior to 1980, the county lost an average of 3,500 acres of farmland per year to development. In the first decade following the establishment of the TDR program, the county lost a total of 3,000 acres to development, a drop of approximately 92 percent. The New Jersey Pinelands, an environmentally unique and sensitive area of about one million acres, was targeted for protection through The New Jersey Pinelands Protection Act of 1979. A TDR program was established in 1980 which had protected 5,300 acres by 1991. In 1997, the Minnesota legislature passed enabling legislation to explicitly allow local units of government to develop and utilize TDR programs. The Green Corridor Project developed Minnesota's first formal Transfer of Development Rights program in Chisago County. The county adopted a TDR ordinance in 2000, but no transfers have yet been made⁴.

³ *Field Guide to Transfer Of Development Rights (TDRs)*, Updated March 2007, National Association of Realtors, www.realtor.org

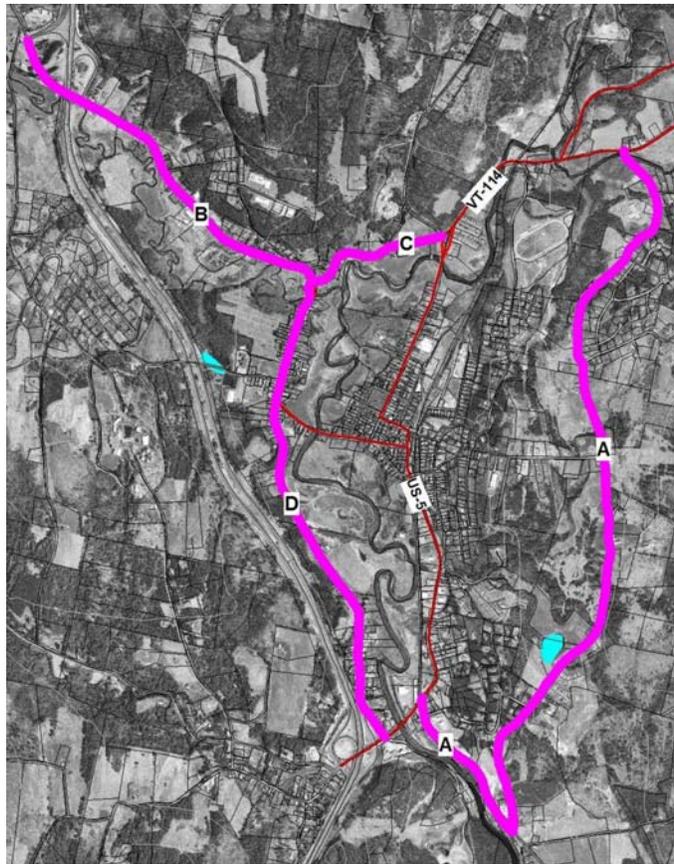
⁴ Source: 1000 Friends of Minnesota Fact Sheet #5, Transfer of Development Rights Feb. 7, 2005

Alternate (Bypass) Routes

Because conditions are often congested along Broad Street, and roadway geometry through the village center can be difficult for large trucks, the possibility of alternative routes that do not traverse the village center and/or the Broad Street commercial area have been a consideration in this study. This is relevant for:

- local traffic that must use these routes frequently and encounter significant congestion and delays,
- ski area traffic
- through traffic on VT 114, which is a primary connector to the Northeast Kingdom and beyond to Canada; and US 5, that serves business and commercial centers in both Vermont and Canada.

Three potential alternate, or "bypass", routes have been considered: Red Village-Lily Pond Rd (route A on map), VT 122-Stevens Loop (route B-C), and Back Center-Stevens Loop (route C-D). Relevant characteristics of each are discussed below.



Red Village-Lily Pond (Route A)

- already used by many knowledgeable locals traveling between northern and southern sections of Lyndon
- much of Lily Pond gravel and largely unsuitable for carrying heavy traffic loads
- major through routing will increase development pressures in this portion of town
- fairly significant slope at southerly end of Lily Pond; also to return to Rt 5/Broad St requires fairly significant "jog" onto Red Village
- Red Village and Broad St intersection experiences significant delays and congestion here under current conditions

VT 122-Stevens Loop (Route B-C)

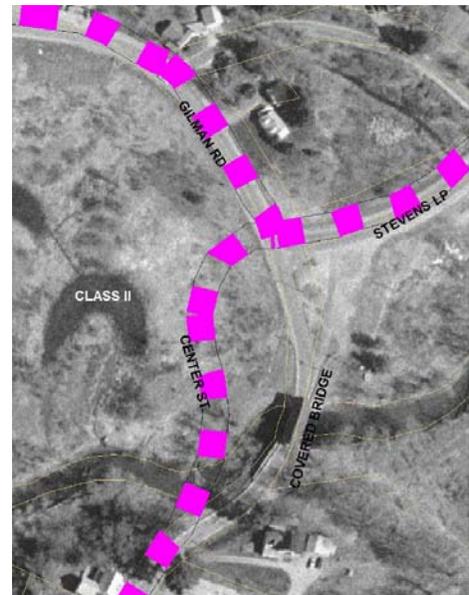
- provides reasonable connection, especially for trucks between interstate and either US 5N or VT 114N
- truck weight limitations on the interstate limit its utility for an alternate truck route, although there has been some discussion at the State level of addressing the interstate weight limitations
- represents a significant "detour" for traffic accessing the northerly routes from the south
- offers fairly direct connection to both US 5 and VT 114

Back Center-Stevens Loop (Route C-D)

- in many ways this is the most direct and attractive alternate route; direct connection to Lyndon Center, Lyndon Institute and the State College.
- impacts historic Lyndon Center, although does not suffer from such serious geometric limitations.
- historic one-lane covered bridge is another major limitation on the utility of this route as an alternate. A parallel bridge could be constructed at significant expense. There are also some environmental and geometric limitations: west of bridge is limited by class 2 wetland, east of bridge geometry is constrained by existing home.

Conclusion

- any of these routes could potentially offer an attractive alternative for through traffic (either local, or longer distance) to avoid the most difficult conditions on Broad St and also reduce traffic impact in that area.
- all options would require significant improvement at significant expense; also incur some environmental impacts.
- the interstate option will require a significant policy change at the federal level to be implementable.
- because of the high local trip generation on both Broad St and in the village center, it is doubtful that any alternate route will relieve enough traffic to significantly alleviate problems there, although any would provide at least some travelers a means of avoiding these problems.



Street Trees

Street trees bring many advantages to a community. Trees identify the entry to town; they enhance the appearance of the downtown and bring benefits to drivers, pedestrians, and businesses.

Vermont's village streets have historically been bordered by wide greenbelts and shade trees. Although modern roadway conditions, of road salt, air pollution and snowplowing, all impair the growing environment, street trees continue to be valued and planted. Despite the horticultural challenge, with the correct tree selection, good site and soil preparation, and proper installation techniques, trees can and do thrive in roadway settings.



The art and science of urban forestry has greatly advanced in past decades. The Vermont Urban Forestry program offers both technical and financial assistance to help communities plan for, select and fund street tree installations.

With the constraints on town budgets it is often difficult to argue for the benefits of trees. However it has been shown that the initial investment and long term maintenance costs are repaid in multiples with the contribution that mature trees make toward creating an inviting, livable and economically vital town center. A long term view in cost-benefits is needed in promoting this important amenity.

Benefits

The benefits listed below are more fully explained in *Landscape Guide for Vermont Roadways and Transportation Facilities*, June 2002 Available from the Vermont Agency of Transportation.

<http://www.aot.state.vt.us/progdev/documents/design/vtrans%5Flandscape%5Fguide.pdf>

Urban Street Trees – 22 Benefits, Dan Burden, Glatting Jacson, *Walkable Communities, Inc* 2006 is another useful reference.

Vehicular Transportation Benefits

Safety - Street trees used in combination with curbs and sidewalks have been shown to slow traffic by narrowing the appearance of the roadway and defining the downtown setting. Slower traffic has been shown to result in fewer and less severe accidents.⁵

⁵Poe, Christopher. *Traffic Calming and Low-Speed Urban Street Design*, Pennsylvania Transportation Institute, Pennsylvania State University, Research Office Bldg., Univ. Park, PA 16802. Dec. 4-6, 1995 TD100: PA95-9512.

- Wayfinding- Roadside trees or groups of trees can serve as landmarks along the roadway, and even alert drivers to turns in the road.
- Multi-modal Benefits- Pedestrians benefit from the summer shade and cooling of street trees. Street trees encourage pedestrian use by greatly improving pedestrian comfort. More people on the street also add to community safety.

Community Benefits

- Economic - Despite the difficulty of placing a value on such intangible factors, research has determined that communities do better economically when they protect their existing trees and continue to plant new ones.⁶
- Aesthetic and Quality of Life
 - Defining Community Character
 - Defining the Entrance or Gateway to a Community
 - Screening
 - Framing Views
 - Noise Attenuation



Main Street (US 7), Saint Albans, VT

Ecological Benefits

- Air Quality⁷
- Water Resources
- Cooling and Energy Savings⁸
- Wildlife

Selection

Street tree selection should consider the site or location where the tree is to be installed and the soil type and growing conditions.

Where to Plant

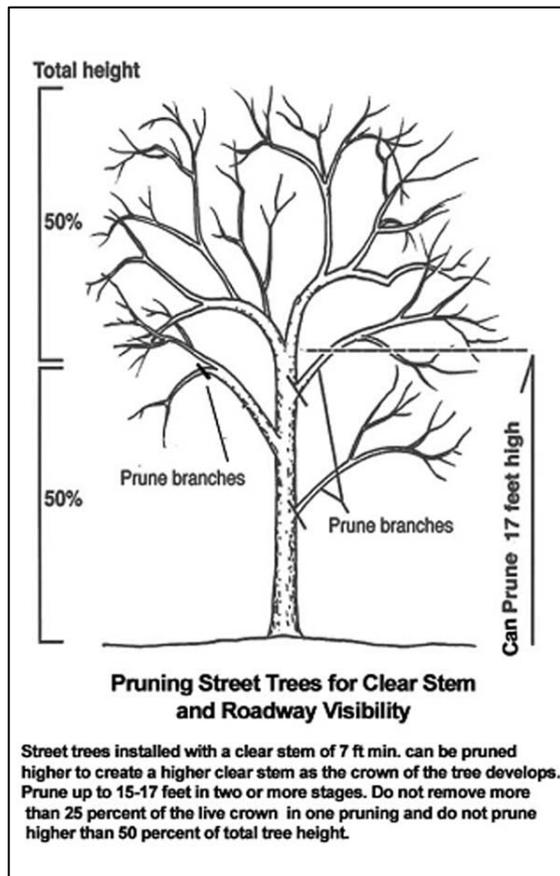
Ideally street trees are planted in a greenbelt between the roadway and the sidewalk. The greenbelt location provides three benefits for the pedestrian: 1. Horizontal separation from the roadway (the greenbelt), 2. Vertical separation (the row of tree trunks) and 3. The sheltering canopy of branches in the adjacent photo. If greenbelt space is not available, a planting site may be located on the outside edge of the right-of-way between the sidewalk and the adjacent parcel. This location provides the pedestrian one out of three benefits cited above; the canopy.

The wider the greenbelt, the better the growing environment for a street tree. Although trees can and do grow in narrower places; a six foot wide greenbelt is minimum for a most roadways.

⁶ Dwyer, John F. *Economic Benefits and Costs of Urban Forest*, Abstract; Proceedings of the Fifth National Urban Forest Conference.

⁷ McPherson, E.G., *Economic Modeling for Large Scale Tree Plantings*. In E. Vine, D. Crawley, and P. Centolella (eds.) *Energy Efficiency and the Environment: Forging the Link*, Chapter 19, American Council for an Energy Efficient Economy, Washington DC, 1991.

⁸ Forest Report R8-FR 17 *Benefits of Trees* USDA Forest Service Southern Region, 1740 Peachtree Road, NW, Atlanta, GA.



Trees can and do grow in narrower greenbelt locations but a 6 foot width allows protection from sidewalk and roadway plows and a larger area for root growth.

Street tree Maintenance

The community should anticipate some costs associated with street tree maintenance and replacement. Although trees are relatively low-maintenance, some funds should be set aside for pruning and replacement.

Trees should be selected for vigorous growth habit, Zone 4 winters and salt tolerance. Proper installation in a wide greenbelt with good soil will reinforce their chance for success. New trees should be guaranteed for a minimum of one year and watered for the first year or two.

Pruning new trees should start after they are in place for 3 years to establish good structure. Once trees are established their on-going maintenance should include pruning of dead and poorly aligned branches on a 5-7 year cycle, with young trees needing more frequent pruning than mature trees.

Street trees are installed with a clear stem (no branches) to a height of 7 feet to allow visibility from driveways and pedestrian crossings. Lower limbs can continue to be pruned up to half the height of the tree as shown in the diagram to the left.

Costs

The municipal budget should include funds for maintenance of healthy trees and for the replacement of trees that fail from time to time. One or two percent of the towns street trees may require replacement over a period of 5 years.

Approximate costs:

New Street Tree

– installed and guaranteed for one year
3-3 1/2" caliper tree -- \$400 - \$500

Tree pruning

One block - 6 young trees (3 years after installation)
--\$300 (or could be volunteer effort)

Pruning 6 trees on 5 year intervals (trees aged 3-15 yrs)
-- \$ 600

Tree removal and/or pruning of large trees-- varies with size and location of tree. \$500-600 per tree avg.