PROJECTIONS

Projections estimate future growth based on statistical models that extrapolate past trends and current conditions into the future. Projections can be created through very simple or very complex calculations. Deciding which method to use is based on the available data and desired use of the projection.

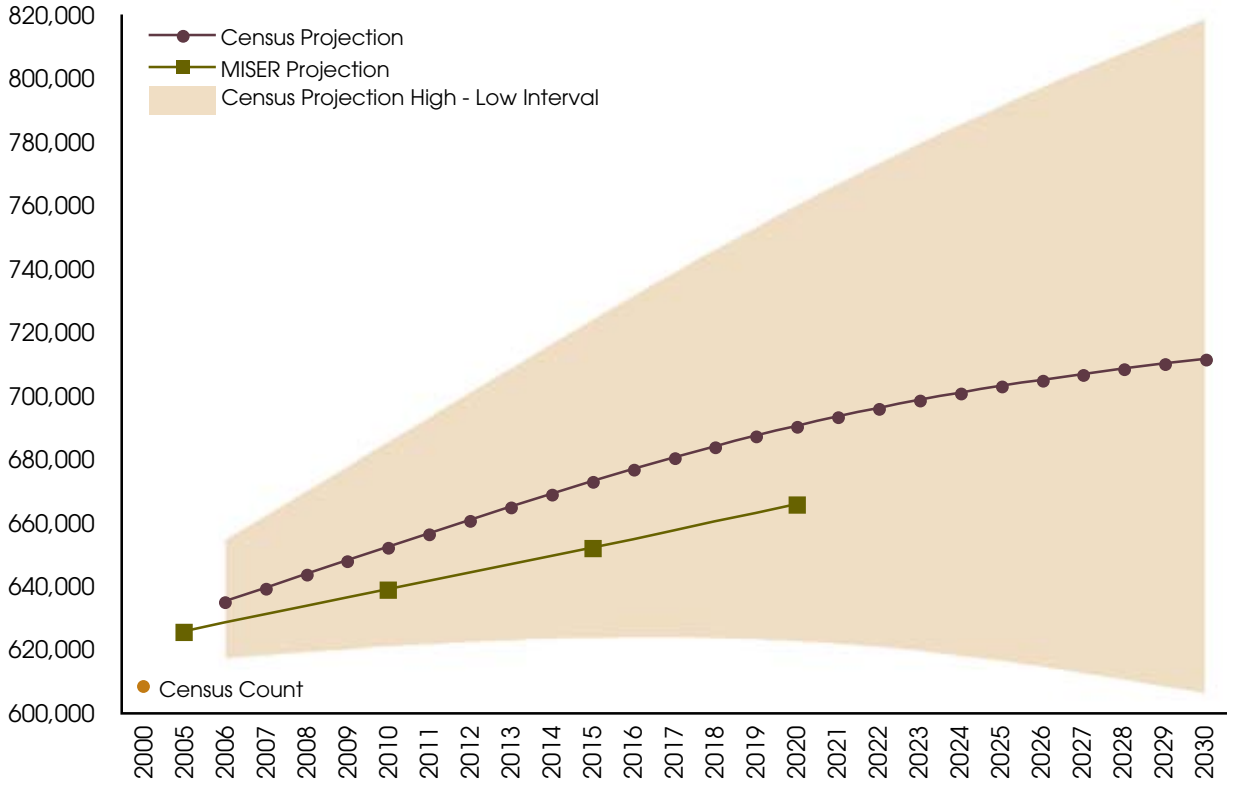
The mathematical models that underlie projections can be adjusted based on "value judgments" made to reflect assumptions of future changes. Projections of future population commonly take into account economic variables that are the principal driving force of population change. Projections can also be adjusted based on the availability of resources in an area or limitations on growth imposed by infrastructure capacity or land use regulations. It is important to document all assumptions made when developing a projections.

The small size of most Vermont municipalities makes it difficult to accurately derive demographic and economic projections at the local level, since the smaller the population or economic base, the greater the likelihood for short-term variations. Smaller populations are more affected by migration (people moving in and out), which is the most difficult component of population change to predict. Additionally, the further into the future an estimate extends, the less reliable it becomes.

Population projections will provide a gross count of the number of people living in an area at a given point in the future, but they may also break down the numbers based on the demographic characteristics of those residents. While such information can be useful for planning, as estimates become more detailed, the level of certainty generally decreases.

The state-level Census Bureau projections to 2030 include figures broken down by gender, age and race. As Figure 37 below indicates, the Census Bureau projection is an average based on a high and low rate of growth. The difference between the high and low projections widens over time. The MISER Vermont population projection to 2020 (which includes state

Figure 37. Vermont Population Projections



and county projections) anticipates a slower rate of growth in Vermont than the Census Bureau model.

Housing projections are typically based on population projections. When combined with estimates of average household size, population projections can be used to forecast housing demand. When projections are broken down into demographic groups, household size can be more accurately estimated and more information can be inferred about the types of housing that will be needed for the expected households.

Employment projections are typically a product of complex econometric models. At a local level, models analyze trends in various sectors of the economy in order to predict future strength or weakness. The relationships between the local, regional, national and even global economies are considered. Economic forecasts are more complicated than population projections because there are more variables influencing change.

The economic base of many Vermont municipalities is too small to accurately project employment trends. Economic data is generally subject to privacy considerations and is not disclosed when numbers are small. Most Vermont municipalities will need to rely on regional economic forecasts although the assumptions of those models should be reviewed in light of local conditions. Employment and population trends are interrelated because availability of employment is typically the most important consideration when people are deciding where to live.

Three common methods of projecting population change are briefly presented below beginning with the simplest, least accurate methods and concluding with more sophisticated models. There are situations in which all of the techniques described are valid based on the available data, geographic area of interest or intended use of the projection. Housing and employment projections are frequently based on similar models.

- **Extrapolation Techniques.** There are a number of mathematical formulas that can be used to project future population using only historic population data (arithmetic change, exponential change, polynomial curves, Gompertz curves, logistic curve and regression analysis). While these types of projections are not as precise as more complex calculations, they can be done using data that is readily available for all Vermont municipalities and do not require sophisticated software. These projections can accurately predict change only to the extent that the conditions affecting growth (such as birth, death and migration rates) remain constant.
- **Share or Ratio Approach.** This method is frequently used to project change in a small population by comparing the relationship between a small area and a large area (which encompasses the small area) over time. This method can increase the accuracy of projecting population in a small area since a more sophisticated projection can usually be done for larger geographic areas (because of the availability of needed data and the larger sample size). This method can also be used to project change in one variable, such as population, based on change in another such as jobs. Incorporating population density into this model is useful where growth is expanding rapidly from a metropolitan center to outlying municipalities. Density can be used to establish an upper limit for growth and disperse growth to adjacent areas when that limit is reached.
- **Cohort-Component Model.** This methodology first separates the population into age groups by gender (cohorts). It then applies the various components of population change (births, deaths, and migration) to each cohort in a given increment of time over the projection period. Once the population is broken down into cohorts, the demographic processes that result in population growth (births, deaths and migration) can be more accurately modeled. Additional data is required to prepare projections using this method such as fertility and mortality rates and life expectancy for the various age groups. These data are readily available at the national level, but state or regional rates should be used if available to increase the accuracy of the model. A number of methods exist for predicting migration rates and it is this factor that is the most open to debate when projections are prepared.

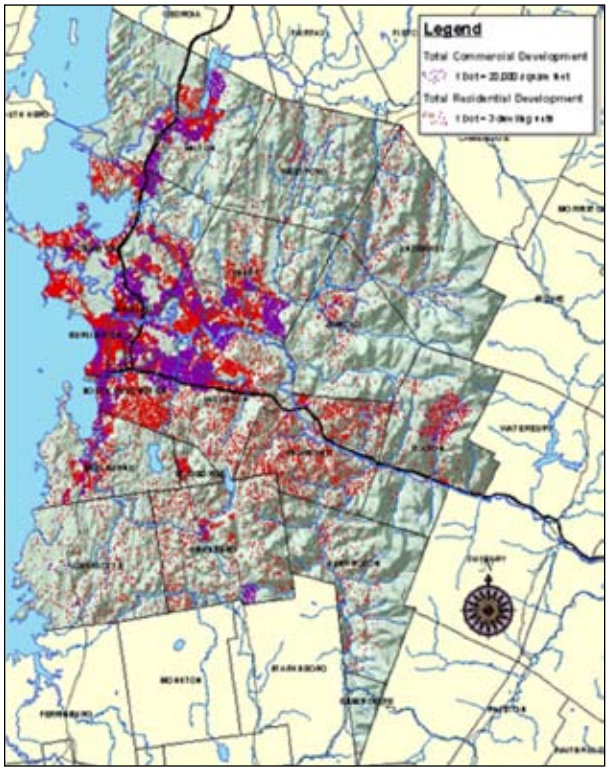
Build-Out Analysis

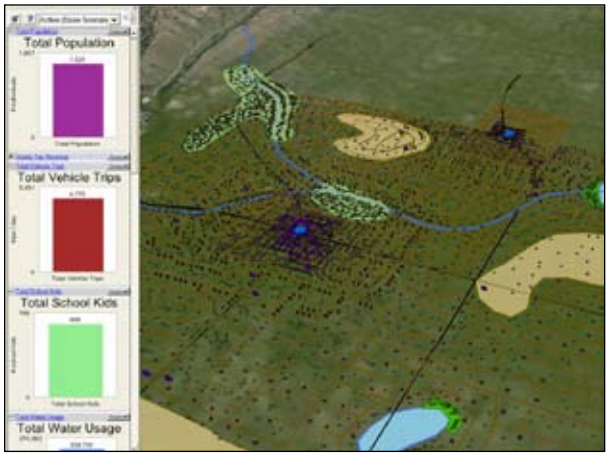
A build-out analysis is a planning tool that can be used to visualize what land is available for development within a municipality or region and quantify how much development can occur under a specific set of regulatory conditions. It can provide an assessment of potential development resulting from a community's existing land use regulations or it can be used to compare alternative development scenarios. While build-out analyses provide data about the amount of potential development and its location, they generally do not project the rate at which development will proceed or the length of time it would take to achieve full build-out.

Build-out analyses can be undertaken at different scales from a regional perspective to the site design level. The availability of GIS software and data has greatly reduced the time required to calculate potential development at the regional or community scale. The basic data a municipality will need to conduct a GIS-based build-out analysis may need to be digitized or converted to work with GIS software.

Many build-out analysis software applications and GIS plug-ins have been developed in recent years.

Fig. 38. Chittenden County RPC Build-Out Analysis





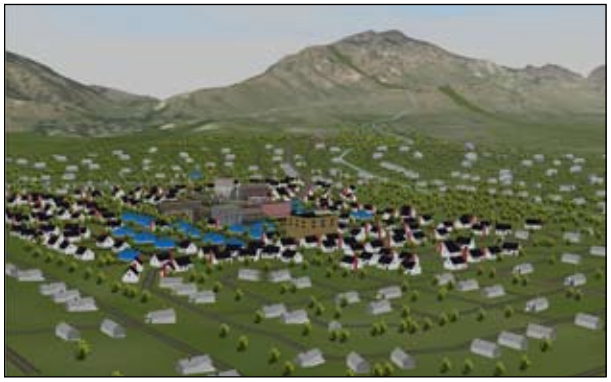


Figure 39. CommunityViz Build-Out Analysis

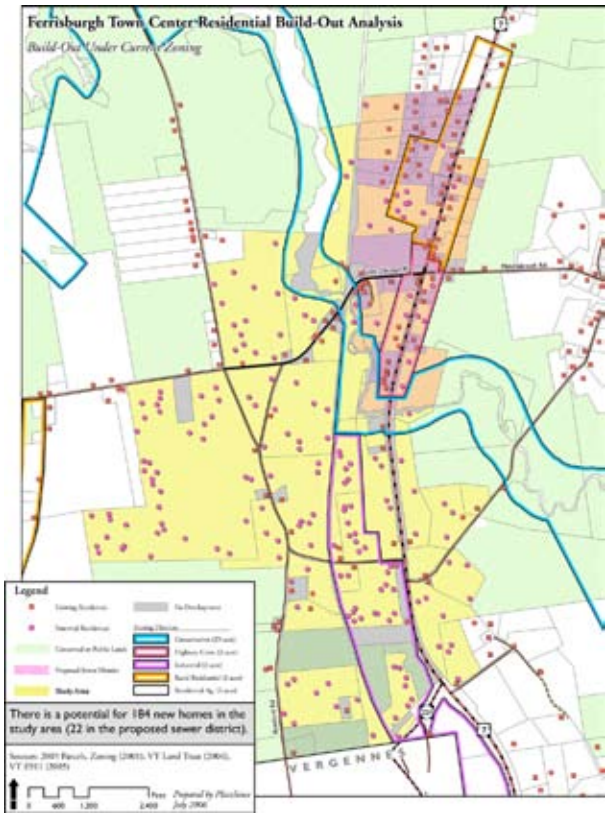
Both Addison County and Chittenden County Regional Planning Commissions have developed build-out applications that are available for use by Vermont municipalities. The Orton Foundation's CommunityViz software, which has been used by several Vermont communities, includes a build-out analysis in addition to other visualization tools.

Build-out analyses typically need three basic sets of information about the area to be studied:

- The current pattern of land subdivision and ownership (i.e. tax parcels)
- The amount and location of existing development (i.e. homes, businesses and public uses, which is available for all Vermont municipalities as a point file of E911 sites)
- The amount and type of development allowed (i.e. permitted uses and dimensional standards within each zoning district)

The quality of the data upon which the build-out analysis is based can significantly affect the accuracy of the quantitative results. The sources and limitations

Figure 40. Addison County RPC Build-Out Analysis



of the base data should be included in the documentation of the build-out methodology and assumptions.

To refine a build-out analysis, it may be desirable to take certain types of property that are not available for development out of the model (such as National Forest, State Wildlife Management Areas, permanently conserved lands or cemeteries). There are other types of land that may be ill-suited for development (such as wetlands or steep slopes), which may be removed from the model or have its development reduced by a certain percentage. The likelihood of currently developed property being redeveloped at higher densities needs to be taken into account. Future use of municipally owned open space, vacant or underutilized lands should be considered as well. As with growth projections, build-out analyses are based on a series of assumptions that must be clearly documented.

Basic build-out analyses tend to focus solely on the potential for residential development. However, more complex models can calculate the potential for non-residential development based on zoning standards such as parking, lot coverage, maximum building size and floor-area ratios. For parts of a community where both non-residential and residential uses are allowed, applicants may want to calculate both the maximum residential build-out (assuming no non-residential use) and the maximum non-residential build-out. Assumptions will need to be made about the mix of uses that is most likely to occur in the future. The characteristics of the community and expected development trends should guide a municipality's selection of a build-out tool and the level of detail needed to assist with planning for a growth center.

Land Area Calculations

See Estimating Land Area Needs for Growth Centers, Vermont Agency of Development and Community Affairs, 1995.

Estimating the land area needed for residential uses is fairly straightforward once population growth has been projected and *Estimating Land Area Needs for Growth Centers* provides a clear methodology for preparing those figures.

Calculating the amount of land area needed to accommodate non-residential uses is more complex, however. Employment projections should provide the number of new jobs anticipated by sector. The results can then be placed into categories like warehouse/distribution, high-tech manufacturing, office, retail, medical, etc., each of which will have particular land area needs.

Those land area needs can be expressed in a number of jobs per acre. Estimates of the number of jobs per acre can be calculated based on an analysis of existing businesses in the community or region. The following data would be needed to do such an analysis:

- Business type
- Building square footage
- Lot size
- Number of FTE (full time equivalent) employees.

From that data an average square foot per job and floor area ratio (FAR) can be calculated for various business types and/or geographic areas. Those two figures can then be used to calculate jobs per acre using the following formula:

= 1 ÷ ((sq. ft. per job * (1 ÷ FAR)) * 0.000022957)

The results can be presented in a table as shown in Figure 41 below.

Figure 41. Job Density Calculation Table

Business Type	Sq. Ft./Job	FAR	Jobs/Acre
Warehousing/Distribution	1,400	0.23	7
General Industrial	400	0.35	38
Technology/Flex	450	0.30	29
Office	300	0.60	87
Retail	350	0.44	55
Medical/Government	400	0.34	37

Source: 2002-2022 Urban Growth Report, Portland, OR

Transportation Demand Forecasting

There are a number of different techniques that can be used to forecast transportation demand. However, the process generally proceeds as follows:

- Break the area that requires prediction of future travel demand into study zones.
- Calculate the number of trips starting in each zone for a particular trip purpose. (Trip Generation Analysis)
- Produce a table of the number of trips starting in each zone and ending up in each other zone. (Trip Distribution Analysis)
- Complete the allocation of the various trips among the available transportation systems (transit, pedestrian, and private vehicles). (Modal Choice Analysis)
- Identify the specific routes on each transportation system that will be selected by the travelers. (Trip Assignment Analysis)

The Institute of Transportation Engineers (ITE) produces trip generation rates for a variety of land uses. These can be used to produce a rough estimate of the number of trips that will be generated from new development, especially residential uses since they are primarily trip producers.

The ITE figure from the 7th edition of the *Trip Generation Manual* for average daily trips generated by a single-family home is 10; remember that each vehicle leaving or returning counts as a separate trip. Each apartment, condominium, townhouse and senior citizen housing unit generates seven trips per day.

While the ITE also produces trip generation rates for non-residential uses, the variables that influence those figures are more complex. Schools, for example, may generate between 1.3 and 2.5 trips per student depending on grades served and student bussing. Restaurants may generate between 90 and 500 trips per 1,000 square feet of building area depending on type.

As described on page 36, the Vermont Agency of Transportation (VTrans) may be able to assist municipalities with forecasting transportation demand, as may the regional planning commission and/or the metropolitan planning organization. Municipalities may have access to transportation impact analyses prepared for development projects in the area, which might provide data that could be used to more accurately forecast transportation demand within the proposed growth center.

Traffic Impact Analysis

See Traffic Impact Evaluation: Study and Review Guide, VTrans Development Review Section, 2003.

See Vermont Land Use Planning Implementation Manual, Roads and Highways.

Many municipalities in Vermont already have the authority to require a traffic impact analysis be prepared when projects are being reviewed under the community's zoning or subdivision regulations. VTrans generally recommends that a traffic impact study be required if the proposed development will generate 75 or more peak hour trips, although this is not the only factor to be considered.

A traffic impact analysis provides information about the anticipated traffic impacts of a project on the surrounding highway infrastructure and the capability of that infrastructure to accommodate increased traffic. Currently, it is VTrans' policy to design state highways and to require others accessing state facilities to effect improvements that will maintain level-of-service (LOS) of C. Generally, a road is considered congested when its LOS drops below C. In more urbanized areas, however, levels below C can be acceptable. These level of service standards, which use an A to F scale, are in the process of being revised.

Figure 42. Downtown Brandon, VT

Projecting Commercial Demand

As part of their 20-year projections of anticipated growth, applicants will need to estimate how much new commercial space their communities will need. It is not the intent of the legislation to create new commercial districts that will displace sales from existing districts but, rather, to ensure that existing designated downtowns, village centers and new town centers have high levels of occupancy and are performing well economically before permitting development of new commercial space. Applicants will therefore need to demonstrate that existing commercial space is well utilized before developing new commercial space.

For the purposes of this analysis, applicants should focus on two types of commercial activity:

- Community-serving retail goods and services: Products and services that meet the everyday needs of community residents, like groceries, gasoline, and hardware; basic levels of clothing, furniture, home furnishings, and dining out; and personal and professional services.
- Destination retail goods and services: Specialized products and services that are outside the everyday needs of community residents and that generally rely on attracting customers from a larger trade area (e.g., a half-hour or longer drive).

The level of analysis needed is not as extensive as would be needed for a retail market analysis intended to provide guidance on business development or marketing. A retail market analyst familiar with historic and traditional downtowns should be able to conduct this analysis for considerably less than he or she would conduct a traditional retail market analysis. Applicants may hire a consultant to conduct this analysis or may complete the analysis themselves using the process outlined below. In either instance, the analysis should include adequate documentation of the methodology and source materials used.

Community-Serving Retail

Estimating future demand for community-serving retail goods and services involves three primary steps:

- Estimating how much market demand for community-serving commercial goods and services will be needed for new community residents.
- Estimating how much of this new market demand can likely be absorbed by existing community businesses.
- Estimating how many new square feet of commercial space will be needed.

To estimate how much new market demand for community-serving commercial goods and services multiply the typical sales per household times the number of households.

Information on typical sales per household for a variety of goods and services can be found in the Consumer Expenditure Survey, published annually by the US Bureau of Labor Statistics (http://www.bls.gov). Data tables are available for household income, household size and many other characteristics. Household income is generally the most reliable indicator of demand for consumer goods and services.

To estimate how much of this new market demand can likely be absorbed by existing community businesses (particularly by businesses in designated downtowns, village centers, and new town centers), applicants will need to estimate total current sales in the community and total minimum commercial sales targets for the community. Applicants can then subtract the difference in these two estimates from the amount of new retail demand anticipated, providing an estimate of the new sales volume for which new commercial space will be needed.

- Total minimum target sales for current businesses – total current sales = performance gap

- Anticipated new retail demand – performance gap = new sales volume for which new commercial space will be needed
- Sales volume for which new space will be needed ÷ typical sales/SF = square feet of new commercial space needed

For 2007, it is reasonable to assume a minimum target of $250,000 in gross sales per small retail business and a minimum target of $120,000 in net revenues per professional in a service business or professional office. It is reasonable to assume that these targets will increase each year by the rate of change of the Consumer Price Index.

Information on current retail sales is available from the US Census Bureau in its Economic Census, published every five years. Data is often not reported by the Census Bureau for small communities, as doing so might reveal earnings by individual businesses. In these instances, category totals for the State of Vermont can be divided by the number of businesses per category in the state, then multiplied by the number of businesses in that category in the community.

To estimate how many square feet of new commercial space is needed, applicants can divide the new sales volume anticipated (minus the amount to be absorbed by existing districts) by typical sales per square foot, by business category.

There is no definitive source of information on the average sales per square foot of different types of businesses in historic or traditional downtowns or village centers. The Urban Land Institute compiles and publishes information on sales per square foot for shopping center businesses every three years in *The Dollars and Cents of Shopping Centers*, and the information provided there for neighborhood and community shopping centers is roughly equivalent to that in historic and traditional downtowns and village centers.

Destination Retail

Preparing estimates of market demand for destination retail is more complicated than preparing estimates of market demand for community-serving retail and should be done by a professional retail market analyst.

Applicants interested in developing a destination retail center or cluster of destination businesses should be prepared to demonstrate that the retail center or retail concentration will not deflect sales from designated downtowns, village centers or new town centers within the region.

Figure 43. Burlington's Church Street Marketplace

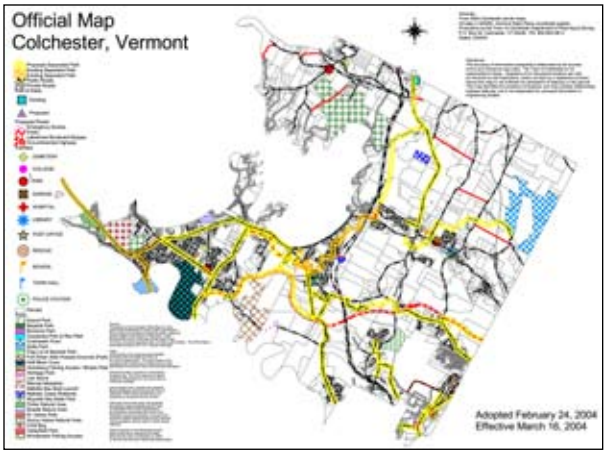
Capital Budget and Program

See Vermont Land Use Planning Implementation Manual, Capital Improvement Program.

Official Map

See Vermont Land Use Planning Implementation Manual, Official Map.

Figure 44. Town of Colchester Official Map



Public Works Specifications

See Vermont Land Use Planning Implementation Manual, Roads and Highways.

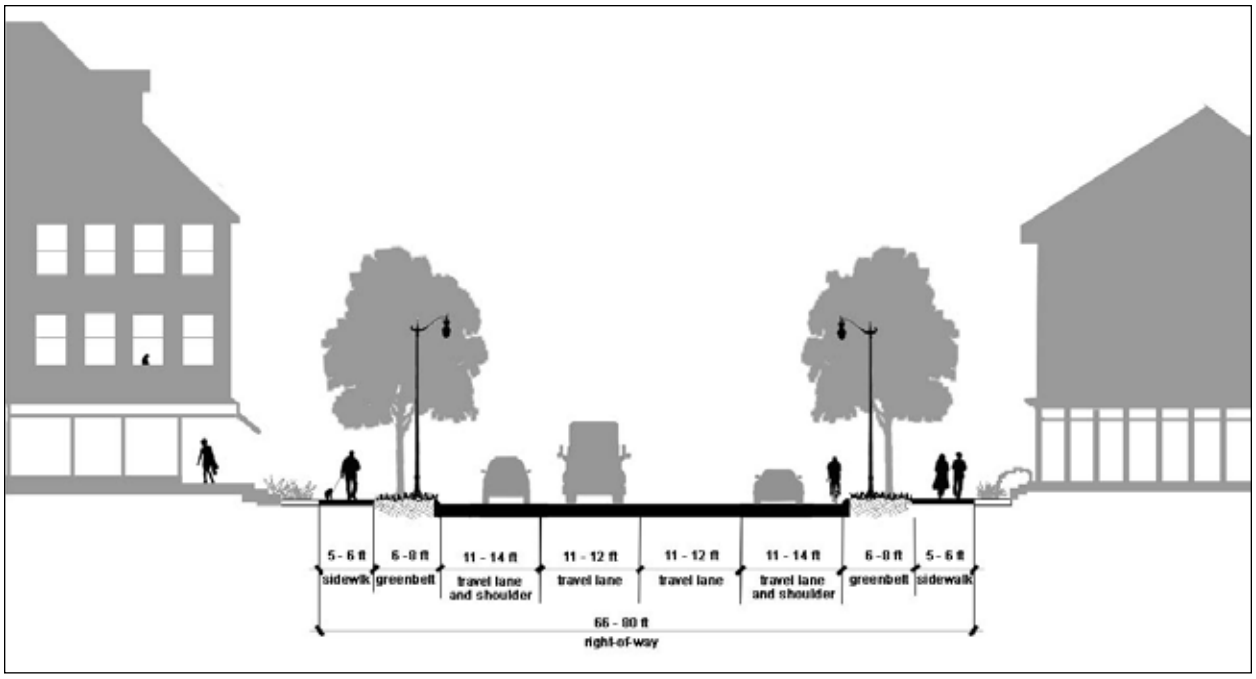
Public works specifications are detailed engineering standards for the design and construction of infrastructure such as streets, transportation paths, sidewalks, water distribution systems, sanitary sewers and storm sewers. Municipalities that adopt public works specifications require all infrastructure to be built to those standards. Others have standards for roads or other infrastructure incorporated into zoning and/or subdivision regulations.

Street design standards are a critical component of creating a human-scaled and pedestrian-friendly community. Streets can be designed to discourage high speed traffic. Elements that should be considered include:

- Street width. Narrower streets slow traffic and are safer for pedestrians.
- Design speed. Neighborhood streets can be designed for speeds of 25 miles per hour or less. A design speed of 35 miles per hour may be allowed for collectors or arterials within a growth center. Vermont law currently allows municipalities to post speed limits of less than 25 miles per hour only within a designated downtown. (23 V.S.A. § 1007)
- Turning radius. Tighter turning radii at corners require vehicles to slow down and allow for narrower street width. A 15-foot radius is fairly standard for downtown intersections.
- Curbs. Curbs are preferred anywhere parallel parking is anticipated. Some neighborhood streets may not require curbs. Uncurbed streets allow stormwater to flow off the road and infiltrate into the ground, while curbed streets typically require a stormwater collection system. Erosion along uncurbed streets can be an issue, however.
- Block length. Neighborhood streets should have shorter block lengths (such as 400 ft.) than collectors or arterials (which may be up to 600 ft.).
- Sidewalks should be required on most roads within a proposed growth center, although they may be optional or narrower on very lightly traveled neighborhood streets.
- Street trees are aesthetically pleasing, increase property values, provide shade and reinforce slower speeds.
- On-street parking, which reduces the number of spaces needed in parking lots, reinforces slower speeds and increases safety for people using sidewalks.

Figure 45. Historic Marble Sidewalks, Bennington

Figure 46. Growth Center Boulevard Cross-Section



Figures 46, 47 and 48 illustrate road design standards that would meet Vermont Agency of Transportation (VTrans) State Design Standards, which apply to any projects with state or federal funding. Excerpts from the state standards applicable to growth centers follow.

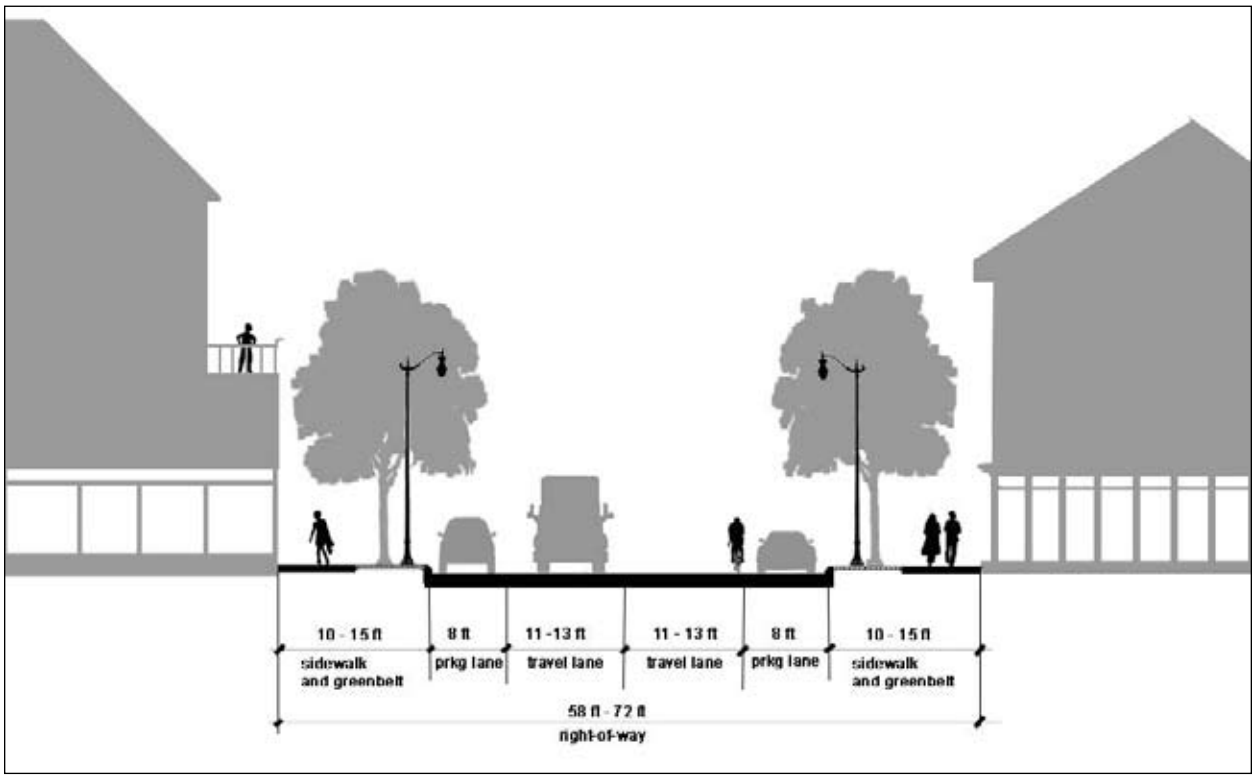


Figure 47. Growth Center Main Street Cross-Section

Figure 48. Growth Center Residential Street Cross-Section

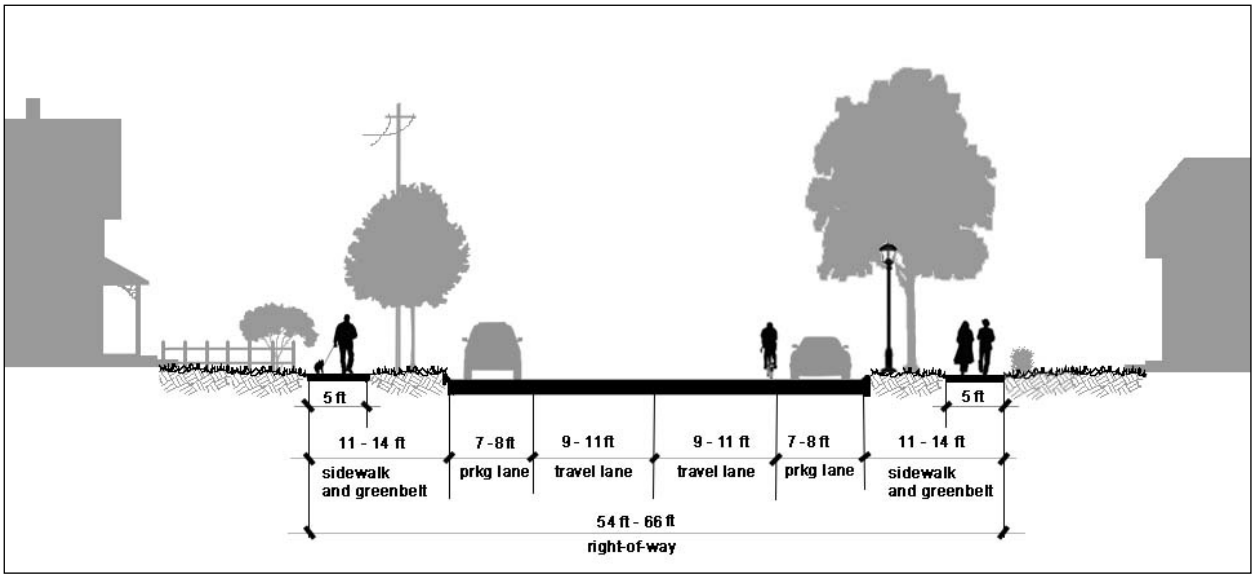


Figure 49. Excerpts from the Vermont State Design Standards Applicable for Growth Centers

Urban and Village Principal Arterials

- Lane widths may vary from 10 to 12 feet.
- The 10-foot widths are appropriate in highly restricted areas having little or no truck traffic.
- The 11-foot lanes are used extensively for urban and village principal arterial street designs.
- Reduced lane widths allow greater numbers of lanes in restricted right-of-way and facilitate pedestrian crossings because of reduced distance. An 11-foot lane width is adequate for through lanes, continuous two-way left-turn lanes and a lane adjacent to a painted median.
- Lane and shoulder widths within historic districts should be compatible with the historic character of the district.
- Parking lanes require approximately 7 feet of actual street space. The desirable minimum width is 8 feet.
- Where shoulders are provided to accommodate disabled vehicles, they must be at least 6 feet wide. The width of shoulders in urban and village areas may be restricted because of available right-of-way, adjacent development and other constraints.
- As an absolute minimum, on limited access principal arterials, where bicycles and pedestrians are prohibited, a 2-foot offset to vertical curb should be provided, and a 1-foot offset to sloped curb.

Urban and Village Minor Arterials

- Lane widths may vary from 10 to 12 feet.
- The 10-foot widths are appropriate in highly restricted areas having little or no truck traffic. The 11-foot lanes are used extensively for urban and village minor arterial street designs. Reduced lane widths allow a greater number of lanes in restricted right-of-way areas and facilitate pedestrian crossings because of reduced distance. A 10-foot left-turn lane, or a combination lane used for parking, with traffic during peak hours, is also acceptable.

- Lane and shoulder widths within historic districts should be compatible with the historic character of the district.
- Parking lanes require approximately 7 feet of actual street space. The desirable minimum width is 8 feet.
- As an absolute minimum, where no bicycles are to be accommodated, a 2-foot offset to vertical curb should be provided, and a 1-foot offset to sloped curb.

Urban Collectors

- Lane widths may vary from 9 to 11 feet.
- 9-foot widths are appropriate in highly restricted areas having little or no truck traffic.
- 11-foot lane widths are generally used on all higher speed, free-flowing collectors.
- Lane and shoulder widths within historic districts should be compatible with the historic character of the district.
- Shoulders are desirable on urban and village collectors, and should be provided where feasible to facilitate maneuvering space for immobilized vehicles, safety for the pedestrian in areas where sidewalks are not provided, safe accommodation of bicycles, speed-change lanes for vehicles turning into driveways, and storage space for plowed snow. Despite these advantages, the width of shoulders in urban and village areas may be restricted because of available right-of-way, adjacent development and other constraints.
- In residential areas, a parallel parking lane of 7 feet may be used.
- In commercial and industrial areas parking lane is 8 feet.
- 9 to 11 foot parking lanes should be used when the use of the parking lane during peak periods for through traffic is necessary.
- As an absolute minimum, a 2-foot offset to vertical curb should be provided, and a 1-foot offset to sloped curb.

Urban Local Streets

- On urban and village local streets, lane widths may vary from 7 to 11 feet, and there should be appropriate offsets to curb. The 7 and 8-foot widths may be appropriate in residential areas having very low traffic volume and little or no truck traffic.
- Lane and shoulder widths within historic districts should be compatible with the historic character of the district.
- As an absolute minimum, a 2-foot offset to vertical curb is recommended, and a 1-foot offset to sloped curb. In all cases, drainage grates and drop inlets should be designed so that they do not project into a travel lane. Drainage grates should always be bicycle-safe in design.

Economic Vitality Considerations

- Use appropriate turning radii for large commercial vehicles at appropriate intersections.
- Use lane widths wider than recommended minimums when necessary to accommodate commercial vehicles or anticipated increased traffic volumes.
- Consider truck routes to avoid impacts on downtowns, neighborhoods, and historic districts.
- Retain existing parking, including angle parking, and/or provide additional parking in commercial areas.
- Consider landscaping, lighting, and aesthetic treatments that complement and enhance the commercial identity of a downtown, historic district, shopping district, or recreational area.
- Use appropriate designs for pedestrian and bicycle needs to enhance the vitality of village and urban areas.
- Consider the needs of public transit and intermodal connections, such as bus stops, transfer locations, and park-and-ride lots.

Master Plans

Municipalities can prepare physical master plans for downtowns or village centers, strategic properties, or main street corridors. A master plan sets forth a long-term vision for physical changes, usually with recommended phasing by implementing a series of discrete projects over a number of years. Cost estimates, a multi-year financing plan and potential funding sources are typically included. The plan aides in coordinating the efforts of the multiple entities that will be responsible for undertaking improvements. A master plan is more detailed than a municipal plan, although it may be incorporated into the municipal plan by reference.

While frequently focused on public improvements, master plans can encompass private properties and provide guidance on how they can be improved or developed in a manner that furthers community goals.

In addition to the illustrative master plan typically prepared as part of the planning process, the plan may also include:

- Inventory and needs analysis.
- Project costs, priorities and phases.

Figure 50. Shoreham Commons Master Plan

Vermont Design Institute, 2003

Figure 51. Milton Downtown Development Concept

David Sptiz and the SE Group, 2000

- Market analysis.
- Funding opportunities.

Master plans generally include one or more of the following elements:

- The use of and rehabilitation of existing public buildings or spaces.
- The location of new or expanded public buildings or spaces.
- Design criteria and/or building envelopes for expanded or new buildings.
- Improvements to and expansions of the transportation network including roads, sidewalks, trails, greenways and parking.
- Streetscape improvements and traffic calming techniques.
- Recreation facilities and public open space.

Multi-Modal Transportation Plans

A multi-modal transportation plan assesses important origins and destinations within a municipality or other geographic area and develops a circulation plan linking those uses and providing convenient access to them by alternatives modes. The circulation plan should result in an integrated network that uses roads, parking lots, sidewalks, paths and bus or carpool systems (if available) in a completely connected

Figure 52. Montpelier's Capital District Master Plan

Gossens Bachman, The Office of Robert A. White, and Louis Berger and Associates, 2000

system. When a multi-modal transportation plan is implemented, residents will have access to most of the municipality's destinations and choices of how to travel to them.

Open Space Plans

See Vermont Land Use Planning Implementation Manual, Open Space and Resource Protection Programs.

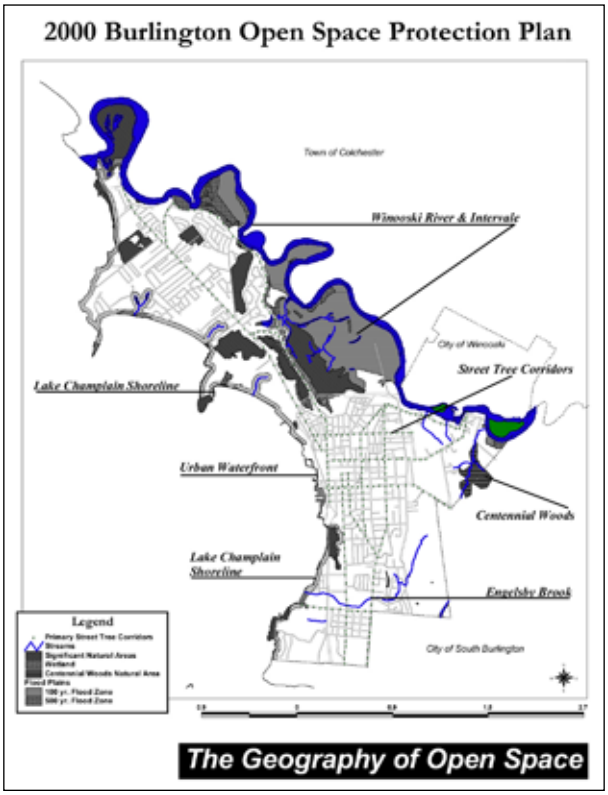
Facility Management Plans

See Vermont Land Use Planning Implementation Manual, Facilities Management.

Growth Management Plans

A growth management plan or study analyzes a municipality's ability to accommodate growth and establishes an appropriate rate of growth that will not exceed the municipality's ability to provide (and afford) facilities and services. Once an appropriate rate is determined, policies such as sewer allocation ordinances, impact fees and phasing can be used to regulate growth.

Figure 53. Burlington Open Space Map



Sewer Allocation Ordinances

See Vermont Land Use Planning Implementation Manual, Facilities Management.

A sewer allocation ordinance can be used to promote development within service areas, such as a designated growth center, by prohibiting the extension of infrastructure beyond delineated service areas. Projects must be granted sewer capacity by the municipality before construction can begin. Sewer allocation can be used as a growth management strategy by linking it to phasing requirements for large developments.

Phasing of Development

See Vermont Land Use Planning Implementation Manual, Facilities Management.

Impact Fees

See Vermont Land Use Planning Implementation Manual, Impact Fees.

Dedication Requirements

Many municipalities are authorized to require dedications of land for public uses (parks, school sites, open space, etc.) within their land use regulations, although these provisions are infrequently used in Vermont. Dedication requirements need to be supported by and work with a municipality's plan, Official Map, impact fee system, and/or capital budget and program.

Financial Incentives

Municipalities can use market-based approaches to encourage developers to propose projects that meet specified community goals. Financial incentives reduce investor risk or close financing gaps, or both, attracting investment capital to priority community projects. Among the incentives often used:

- Density bonuses.
- Transfers of development rights (TDRs).
- Reductions in fees. Municipalities sometimes reduce development impact fees, permitting fees or other typical development fees.
- Property tax abatement. Municipalities might partially or completely abate property taxes for a specified number of years to help reduce a project's annual expenses.
- Tax increment financing (TIF).

There are also a number of state and federal financial incentives available for development, from historic rehabilitation tax credits to funds for affordable housing development. Municipalities can play a valuable role by helping property owners and developers learn about and tap these resources. In addition, there are some resources for which municipalities can apply, making funds or financing available for development in targeted areas. For example:

- The Vermont Community Development Program awards Community Development Block Grants on a competitive basis to Vermont municipalities for projects that meet state community development objectives.
- The federal Main Street/HOPE VI program provides gap financing for projects that create affordable housing in and adjacent to historic and traditional commercial districts in communities with fewer than 50,000 people, no more than one public housing authority, and fewer than 100 units of public housing.

Density Bonuses

Density bonuses permit higher-density development, which increases the developer's profit, in exchange for providing improvements for the public good – such as affordable housing, community meeting space, recreation facilities, or land conservation – that may not otherwise be profitable for the private sector. Many Vermont municipalities currently offer density bonuses for development that include elderly or affordable housing.

Special Assessment Districts

See Vermont Land Use Planning Implementation Manual, Facilities Management.

Special assessment districts are typically created through municipal adoption of an ordinance. They allow additional taxes to be levied from a certain geographic area to fund improvements that benefit that area. Special assessment districts have been used to support downtown revitalization in Vermont communities by raising monies that can be used to match grant funds for public improvements such as streetscaping or traffic calming.

Tax Increment Financing

See Vermont Department of Economic Development, Tax Increment Financing District Information (www.thinkvermont.com).

See Vermont Land Use Planning Implementation Manual, Facilities Management.

Tax increment financing (TIF) uses the additional property tax to be paid by new development within a specific geographic area to pay off municipal debt for constructing public facilities to serve that area.

With the passage of the growth center legislation in 2006, Vermont's TIF program was also amended. Under those changes, a proposed TIF within a designated growth center will automatically meet the locational criteria established in statute and will meet the "but for" test that allows diversion of 75 percent of increased state educational property taxes to local debt repayment.

Performance-Based Zoning

See Vermont Land Use Planning Implementation Manual, Performance Standards.

Performance-based zoning focuses on the impacts – such as noise, odor, traffic, etc. – of development and establishes acceptable thresholds for such impacts. Site planning, building design and facility operation become important considerations when determining the impact of a proposed use on a neighborhood.

Many Vermont municipalities already use performance standards to regulate the impact of commercial or industrial uses as described in the topic paper referenced above. Some may have performance standards within their PUD provisions as well.

Since they are not prescriptive, performance standards can provide flexibility to a zoning ordinance and encourage creativity in project design. Performance standards are especially useful where mixed uses are allowed.

Performance-based zoning may be used in concert with a point system for project review as shown in Figure 54 below. Point systems can also be used to set allowable density based on project performance in relation to the municipality's goals. They can allow for trade-offs in a manner that is more transparent to the public and equitable between projects.

Inclusionary Zoning

See Vermont Land Use Planning Implementation Manual, Housing Regulations.

Inclusionary zoning provisions require developers of residential projects (usually of a certain size) to build a minimum percentage of affordable units. Currently,

Figure 54. Smart Growth Performance Measures

	Excellent	Preferred	Acceptable	Minimal
For residential development, proximity to any one of the following: food/ convenience retail, schools, daycare.	Adjacent	<1/4 mi	1/4 to 1/2 mi	>1/2 mi
For commercial development, proximity to any one of the following: housing, restaurants, entertainment.	Adjacent	<1/4 mi	1/4 to 1/2 mi	>1/2 mi
Project is mixed use.	>4 uses or 4 vertically mixed	4 uses or 3 vertically mixed	3 uses	2 uses
Maximize allowable floor-area ratio.	FAR is max allowed by zoning	FAR is within 10% of max	FAR is within 20% of max	FAR is within 30% of max
Average number of dwelling units per acre.	15 or more	10 to 14	7 to 9	4 to 6
Short block lengths.	<400 ft	400 to 500 ft	501 to 600 ft	>600 ft

Adapted from Smart Scorecard for Development Projects, EPA, 2002

Burlington is the only Vermont municipality with inclusionary zoning provisions. Burlington requires most projects involving the creation or rehabilitation of more than five dwelling units to make up to 25 percent of the resulting units affordable. This inclusionary zoning provision also contains a density bonus of up to 25 percent and less restrictive lot coverage standards.

Figure 55. Shops at Bridgewater Mills

Figure 56. Restaurant at Quechee Mills

Figure 57. Hotel Pharmacy, Brattleboro

Adaptive Reuse Provisions

See Vermont Land Use Planning Implementation Manual, Historic Preservation.

Adaptive reuse is a term for using a historic building for a new purpose, often very different than the use it was originally built for. Examples of adaptive reuse include converting a:

- School to housing.
- Mill to a retail center.
- Warehouse to an art studio.
- Barn to a manufacturing facility.
- Barn to housing.

However, municipal land use regulations may prevent old buildings from having a new life. Many structures suitable for adaptive reuse may not meet the dimensional standards of their zoning district - they may be too large, too tall or located in a setback.

Incorporating adaptive reuse provisions into local zoning regulations provides the flexibility needed to allow new uses in these historic structures. Adaptive reuse provisions can also include standards for maintaining the historic character and architectural integrity of buildings being converted to a new use.

Adaptive reuse provisions supports the goal of protecting historic resources both within and outside growth centers. Within the growth center, adaptive reuse can be a form of infill development. Outside the growth center, adaptive reuse may result in the preservation of historic agricultural buildings and the protection of rural character.

Figure 58. Cold Hollow Cider Mill, Waterbury

Form-Based Zoning

See Vermont Land Use Planning Implementation Manual, Design Review.

Form-based zoning is a fairly recent planning concept, which focuses on architectural standards that result in certain types and sizes of buildings being constructed. The relationship between the design of streets, lots and buildings is carefully regulated to produce a specific type of physical environment. It is assumed that uses that can be accommodated in the resulting buildings will be mutually compatible. This approach may be best suited to guiding development in the core of a growth center where the character of the built environment is of primary concern.

The principles of form-based zoning can be incorporated into a traditional zoning ordinance by expanding upon the typical dimensional standards to include additional provisions such as:

- Minimum building heights.
- Maximum setbacks.
- Maximum building footprints.
- Maximum lot widths.
- Minimum building frontage.

The SmartCode is a model form-based development code that incorporates smart growth principles. It was developed by the New Urbanist firm, DPZ, to provide regulatory standards for traditional neighborhood design. The code relies more on graphics than text to communicate requirements as shown in Figure 59.

Design Review

See Vermont Land Use Planning Implementation Manual, Design Review.

Historic Districts

See Vermont Land Use Planning Implementation Manual, Historic Preservation.

Historic Building Rehabilitation Standards

See Vermont Land Use Planning Implementation Manual, Historic Preservation.

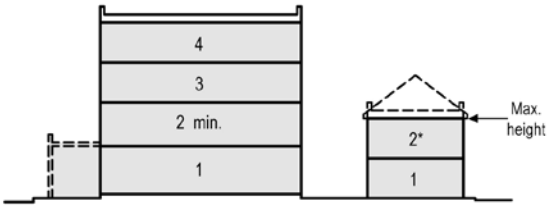
Figure 59. Illustrated Dimensional Standards from the SmartCode

SECTION 5.5.11

BUILDING FUNCTION (see Tables 10 & 11)	
a. Residential	open use
b. Lodging	open use
c. Office	open use
d. Retail	open use
BUILDING HEIGHT (see Table 8)	
a. Principal Building	6 stories max. 2 min.
b. Outbuilding	2 stories max.
LOT OCCUPATION	
a. Lot Width	18 ft min 180 ft max
b. Lot Coverage	80% max
BUILDING TYPE (see Table 9)	
a. Edgeyard	prohibited
b. Sideyard	permitted
c. Rearyard	permitted
d. Courtyard	permitted
BUILDING DISPOSITION	
a. Front Setback	0 ft. min. 12 ft. max.
b. Side Setback	0 ft. min. 24 ft. max.
c. Rear Setback	3 ft. min.*
d. Frontage Buildout	70% min at setback
OUTBUILDING DISPOSITION	
a. Front Setback	40 ft. max. from rear prop.
b. Side Setback	0 ft. min.*
c. Rear Setback	3 ft. max.

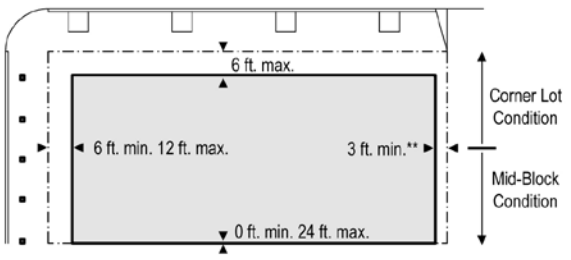
BUILDING HEIGHT

1. Building height shall be measured in number of stories, excluding a raised basement, or inhabited attic.
2. Each story shall not exceed 14 ft. clear, floor to ceiling.
3. Maximum height shall be measured to the eave or roof deck.



BUILDING DISPOSITION

1. The facades and elevations of a building shall be distanced from the frontage and lot lines as shown.
2. Buildings shall have facades along the principal frontage lines and elevations along lot lines (see Table 16E).



SmartCode v.8.0, Duany Plater-Zyberk & Co., 2006

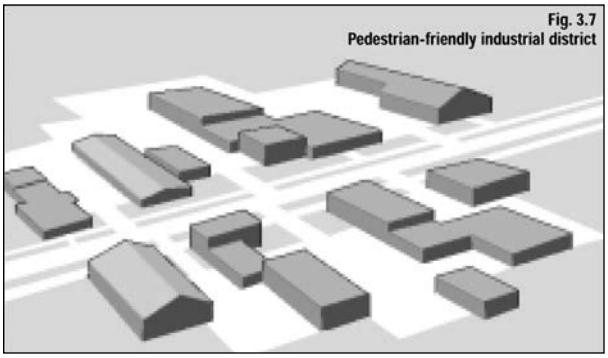
Standards for Large-Scale Uses

A growth center will need to accommodate new development that will be primarily automobile oriented, large-scale, and/or located outside of the downtown or commercial core. When appropriately designed such uses can fit in the growth center and further community goals.

The Vermont Forum on Sprawl's (VFOS) *Growing Smarter: Best Site Planning for Residential, Commercial & Industrial Development* contains specific examples of smart growth development practices. A 2003 VFOS' *New Models for Commercial and Industrial Development Site Plans* presents five model site plans for three properties in Bennington, South Burlington and Waterbury that meet smart growth principles (See Figure 18 on page 52).

The Maine Department of Transportation's *Performance Standards for Large Scale Development* provides detailed guidance on architectural, landscaping, parking, lighting and other standards appropriate for New England communities (see Figure 61). The publication also includes photos illustrating development that meets and does not meet various performance standards.

Figure 60. Illustrations from Growing Smarter



Vermont Forum on Sprawl, 2001

Figure 61. Model standards from Performance Standards for Large-Scale Development

A minimum of 20 percent of the structure's facades that are visible from a public street shall employ actual protrusions or recesses with a depth of at least six feet. No uninterrupted facade shall extend more than 100 feet.

Building facade colors shall be non-reflective, subtle, neutral or earth tone. The use of high intensity colors, metallic colors, fluorescent colors or black on facades shall be prohibited. Building trim and architectural accent elements may feature bright colors or black, but such colors shall be muted, not metallic, not fluorescent, and not specific to particular uses or tenants. Standard corporate and trademark colors shall be permitted only on signs.

Ground floor facades that face public streets shall have arcades, display windows, entry areas, awnings, or other such features along no less than 50 percent of their horizontal length. The integration of windows into building design is required, and shall be transparent, clear glass (not tinted) between three to eight feet above the walkway along any facades facing a public street.

A minimum of 30 percent of the building's total foundation, including a minimum of 50 percent along the building's front facade, shall be planted with landscaping consisting of one 1.5-inch caliper ornamental tree and four shrubs per 10 linear feet of foundation. Preferred locations for such landscaping are near entrances and facades facing public streets.

One 2.5-inch caliper canopy tree, one four-foot high understory tree, and five 12-inch high evergreen or 15-inch high deciduous shrubs shall be planted within each parking lot island. All landscaped areas shall be a minimum of 10 feet in width in their smallest dimension and tree wells shall be a minimum of 36 square feet in area.

Parking lots over 100 spaces shall be segmented visually and functionally into distinct parking areas of no more than 60 spaces by landscaped and curbed medians with a minimum curb-to-curb width of 10 feet. Curbed islands shall be sited at the end of each parking aisle and within parking aisles at intervals no greater than one island per every 20 spaces. Islands at the end of aisles shall be counted toward meeting this requirement. Each required landscaped island shall be a minimum of 360 square feet in landscaped area.

Continuous internal pedestrian walkways, no less than eight feet in width, shall be provided from the public sidewalk or right-of-way to the principal customer entrance of all large commercial buildings on the site. Curbed walkways are preferred. At a minimum walkways shall connect focal points of pedestrian activity such as, but not limited to, transit stops, street crossings, building and store entry points, and shall feature adjoining landscaped areas that include trees, shrubs, benches, flower beds, ground covers or other such materials for no less than 50 percent of the length of the walkway.

Figure 62. Calculating Mixed-Use Parking Requirements

			Weekday		Weekend		Night
		Spaces Needed (by use)	6 am 6 pm	6 am 12 am	6 am 6 pm	6 am 12 am	12 am 6 am
Office	25,00 sq. ft. gross floor area	53	53	5	5	3	3
Retail	30,00 sq. ft. gross floor area	147	88	132	147	103	7
Restaurant	10,00 sq. ft. gross floor area	87	44	87	87	87	9
Residential	40 units	68	27	68	54	68	68
TOTAL		**355**	211	293	**294**	261	87

Using the multiplier table (Figure 63), the total number of parking spaces needed for the mixed-use development can be calculated by multiplying the total number of spaces needed for each use by the appropriate factor from the multiplier table for each time of day. The total number of parking spaces needed for each use individually in this example is 355. Totaling the amount of parking needed in each category returns a peak parking demand of 294 spaces, which occurs during the daytime on weekends. The amount of parking is reduced by 17% or 61 spaces.

Parking Standards

See Vermont Land Use Planning Implementation Manual, Parking.

Many Vermont municipalities incorporate parking standards within their zoning regulations. Most are in the form of a list of use categories with a minimum amount of parking for each unit, employee or amount of building square footage. The number of spaces required is often based on peak demand. The result is that parking standards are one of the leading constraints to achieving compact development in many communities. Municipalities can:

- Incorporate standards for shared parking, especially for mixed-use developments, into their regulations.
- Establish maximum parking requirements in addition to or instead of minimum parking requirements.
- Require creation of on-street parking through road design standards.
- Count on-street parking spaces in front of or within a certain distance of a business as part of their parking requirements and/or provide municipal parking lots and allow spaces in those lots to count towards parking requirements for nearby buildings.

Figure 64. Municipal Parking Lot, Bethel

Figure 63. Mixed-Use Parking Multiplier Table

	Weekday		Weekend		Night
	6 am 6 pm	6 am 12 am	6 am 6 pm	6 am 12 am	12 am 6 am
Office	1.00	0.10	0.10	0.05	0.05
Retail	0.60	0.90	1.00	0.70	0.05
Restaurant	0.50	1.00	1.00	1.00	0.10
Residential	0.50	1.00	0.80	1.00	1.00

Adapted from Montgomery County, MD Zoning Ordinance

In Vermont, parking lots will need to be cleared of snow in winter and that snow will need to either be stored on-site or trucked off-site. Snow removal and storage needs should be considered as parking lot design standards are drafted. Snow storage has stormwater implications and often impacts parking lot landscaping.

Traditional Neighborhood Design

Traditional neighborhood design is one of many terms (new urbanism, neo-traditional, or village-style) used to describe a development pattern characterized by the smart growth principles set forth in Vermont's growth center program. Around the country, some communities have adopted stand-alone traditional

neighborhood ordinances or incorporated traditional neighborhood standards into their existing regulations. Some are focused largely on residential development, while others include standards for commercial and other non-residential uses.

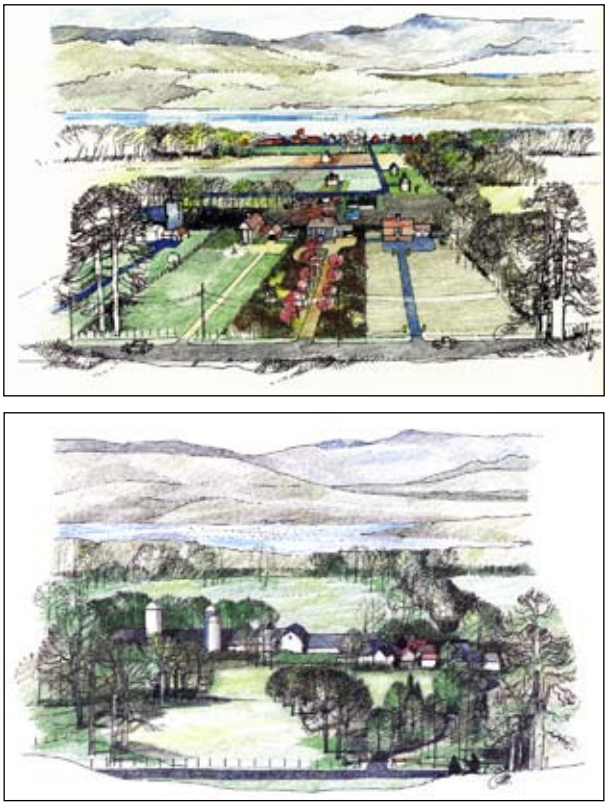
The Great American Neighborhood: Contemporary Design Principles for Building Livable Residential Communities, prepared for Maine State Planning Office provides an overview of traditional neighborhood design from the community to site planning level with numerous recommendations that could be used to develop land use regulations such as:

- Create short blocks, generally not longer than 400 to 600 feet. The optimal number of single-family homes along each side of the street is 6 to 8 per block.
- There is an optimum ratio of the distance between homes on the opposite sides of the street and building heights. In New England villages, that ratio rarely exceeds 4:1 and in urban areas it can be as low as 1:1.
- Net residential density can range between 2 units per acre and 16 units per acre, with most single-family house lots ranging from 7,000 to 15,000 square feet in area.

Figure 65. Great American Neighborhood Design

Maine State Planning Office, 2004

Figure 66. Conventional vs. Cluster Development



Vermont's Scenic Landscapes, 1991

- House lots should generally be long and narrow ranging between 50 to 100 feet.

PUDs and Cluster Development

See Vermont Land Use Planning Implementation Manual, Open Space and Resource Protection Regulations.

Many Vermont municipalities have land use regulations that authorize PUDs (planned unit developments) that cluster development and preserve open space. Unfortunately, these provisions are infrequently used in some communities possibly because they are more onerous than traditional subdivisions or because they are not well understood.

Municipalities can encourage the use of PUD provisions through actions such as:

- Requiring them in certain zoning districts and/or for subdivisions of a certain size.
- Offering a density bonus that may be tied to the percentage of the property to remain undeveloped.

- Establishing a higher allowable density for PUDs than for conventional subdivisions.
- Simplifying and/or streamlining the application and review process.

Conservation Subdivision Design

See Vermont Land Use Planning Implementation Manual, Open Space and Resource Protection Regulations.

Conservation subdivisions are characterized by common open space and clustered compact lots. The purpose of a conservation subdivision is to protect farmland and/or natural resources while allowing the same number of residences as would be permitted under the basic zoning and subdivision regulations. Conservation subdivisions are a more environmentally-oriented form of cluster developments or PUDs.

Conservation subdivision ordinances generally require permanent dedication of 40 percent or more of the total development parcel as open space. Open space design requirements often include contiguity and connection to other open space or conservation areas. Open space uses may include agriculture, forestry, outdoor recreation or wastewater disposal.

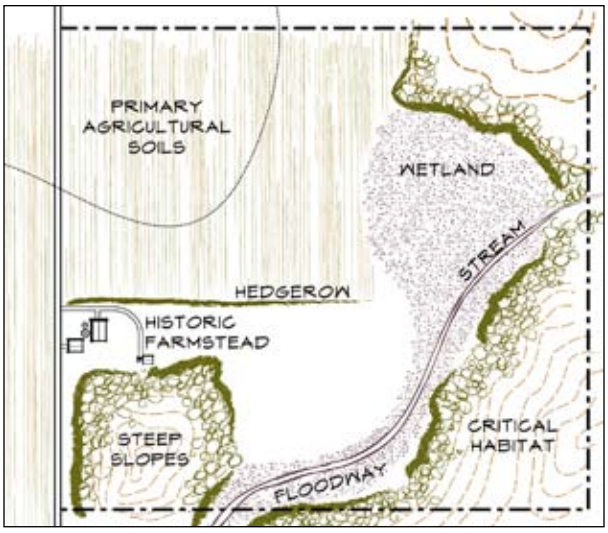
There are a variety of ownership choices for the open space:

- The original landowner can retain ownership of the land and continue to use it as a farm.
- A homeowners' association could manage it.
- It can be held as individual outlots for each of the building lots.
- The municipality, a conservation organization or a land trust can manage the property for conservation purposes or outdoor recreation.

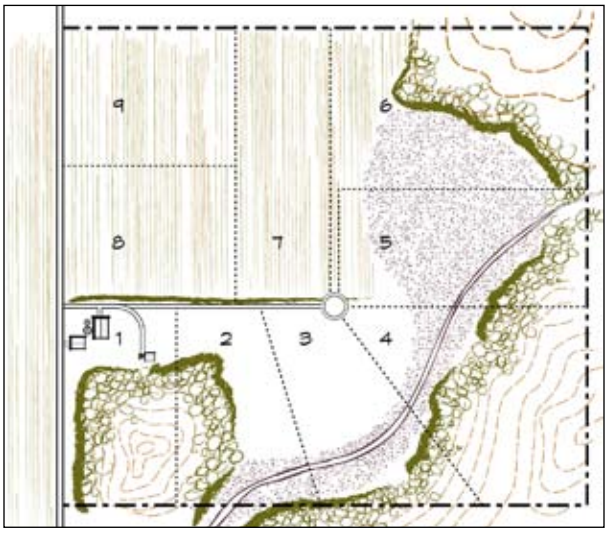
In *Growing Greener: Conservation Subdivision Design*, Randall Arendt offers a framework for subdivision review that encourages the preservation of open space and natural areas. The model ordinance reverses the standard subdivision review process by focusing first on the conservation of natural areas and last on the detailed layout of house lots. The book outlines a four step process for designing conservation subdivisions:

- The cultural and natural resources that are valued on a specific parcel earmarked for de-

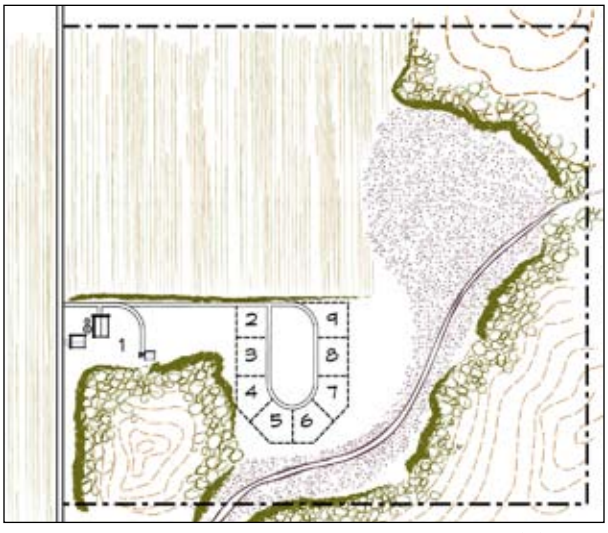
Figure 67. Conservation Subdivision Design



Site Analysis



Conventional Subdivision Yield Plan



Conservation Subdivision

Figure 68. Rural Character

velopment are identified, usually based on conservation priorities set forth in the municipal plan. The resources are classified as primary or secondary conservation areas on the property.

- Open space is set aside, protecting the identified resources.
- House sites are arranged outside of the protected areas.
- Streets, lots and infrastructure are laid out to serve the house sites.

Transfer of Development Rights (TDR)

See Vermont Land Use Planning Implementation Manual, Transfer of Development Rights.

While TDR has not been widely used in Vermont, state law now specifically authorizes municipalities to allow for multi-lot PUDs on parcels that are non-contiguous and/or in separate ownership. A multi-lot PUD is in essence a transfer development rights from one parcel to another.

One mechanism for incentivizing the use of TDR or PUD provisions is offering a density bonus. Municipalities can establish different density standards for different types of subdivisions in the same zoning district as in the following example:

- Conventional Subdivision: Maximum density of 1 unit per 15 acres.
- PUD: Max density of 1 unit per 10 acres.
- TDR: Max density of 1 unit per 5 acres.

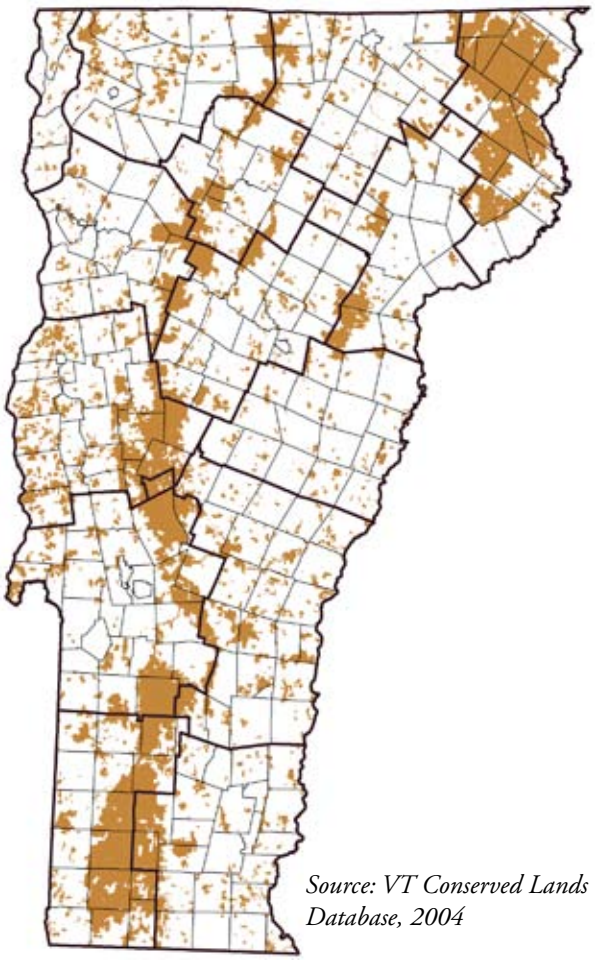
A technique like this can also be useful if a municipality wants to down-zone a district by reducing permitted density as it can allow the affected property owners to retain more development potential if they use the PUD or TDR provisions (or meet other community goals tied to a density bonus).

Many municipal plans have as a goal to preserve rural character. It is important for a community to develop a shared definition of rural character. For some, rural character means working farms or forest lands. Others may place more value on unpaved roads, historic farm buildings, stonewalls or hedgerows. Open space and scenic views may be contributing elements, as well as natural areas and resources. Distance to neighbors, quiet and dark night skies may be part of the definition. Different strategies and techniques may need to be pursued depending on how residents define the community's rural character.

Figure 69. Large-Lot Zoning

Large-lot zoning is not considered an effective tool for maintaining rural character, especially when development proceeds incrementally. More effective techniques maintain a low overall density, but allow development on smaller lots.

Figure 70. Public and Conserved Lands



Source: VT Conserved Lands Database, 2004

Purchase of Development Rights

See Vermont Land Use Planning Implementation Manual, Open Space and Resource Protection Programs.

Fixed Area Zoning

See Vermont Land Use Planning Implementation Manual, Open Space and Resource Protection Regulations.

Fixed area zoning separates density from lot size. This addresses the issue of excessive land consumption associated with low density zoning districts (5 acres or more per home). Low overall densities can be maintained, while allowing development on small lots.

Since this technique does not change the number of lots permitted, it is often less difficult to implement than measures that affect development potential. If smaller lots are going to be allowed in a district that once had large lot sizes, dimensional standards (setbacks, frontage, depth) will likely need to be adjusted as well.

Sliding Scale Zoning

See Vermont Land Use Planning Implementation Manual, Open Space and Resource Protection Regulations.

Sliding scale zoning is a variant of fixed area zoning where the overall density allowed on a parcel of land is inversely related to its size. Smaller parcels have a

higher permitted density, while larger parcels have a lower permitted density. The goal is to limit fragmentation of large tracts of land.

Figure 71. Sample of a Sliding Scale Density Table

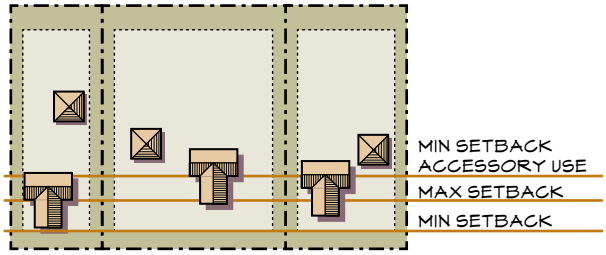
Parcel Size (acres)	# of Lots	Density Range
2 to <5	1	1:2 to 1:5
5 to <15	2	1:2.5 to 1:7.5
15 to <50	3	1:5 to 1:16.67
50 to <100	4	1:12.5 to 1:25
100 to <200	5	1:20 to 1:40
200 to <350	6	1:33.3 to 1:58.3
350+	7	1:50+

Setbacks and Buffers

See Vermont Land Use Planning Implementation Manual, Open Space and Resource Protection Regulations.

Municipalities can establish maximum setbacks, in addition to minimums. These are especially useful for districts that include traditional settlement areas with an established pattern of development and infill potential. Maximum setbacks can also be used to ensure that new neighborhoods develop a consistent pattern along the street.

Figure 72. Minimum and Maximum Setbacks



Different minimum setbacks can be established for different uses. Parking areas or accessory buildings may have a deeper minimum setback, for example, to ensure that they are located behind the front line of the principal building.

Building Envelopes

See Vermont Land Use Planning Implementation Manual, Open Space and Resource Protection Regulations.

As lot size increases, setbacks become a less effective

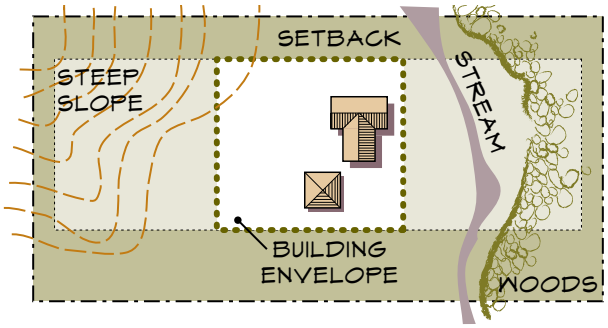


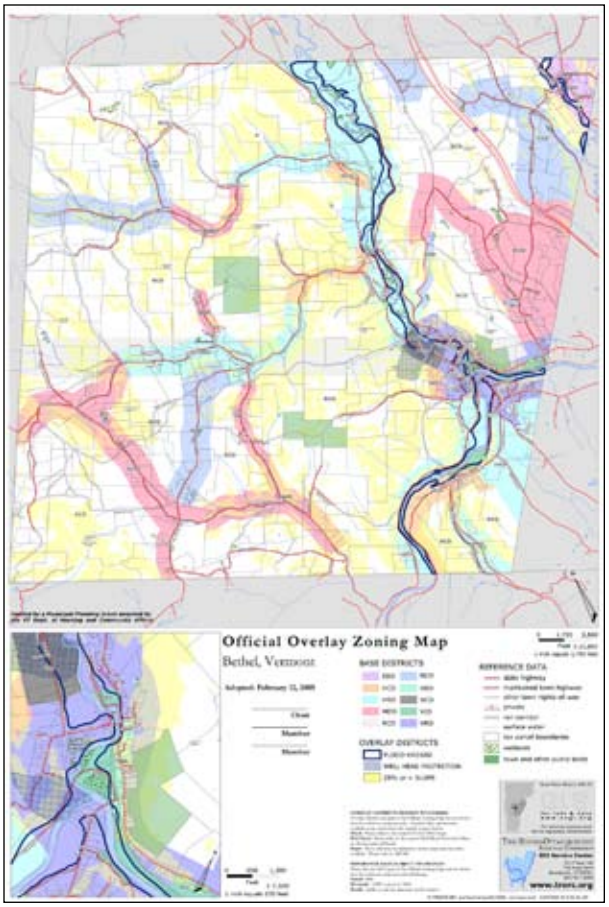
Figure 73. Building Envelopes

tool for regulating where development can occur on a lot. Building envelopes can be used to delineate a smaller area for development than established by setbacks. Building envelopes are also useful for ensuring that development will be located away from any important natural resources on the property.

Conservation Districts and Overlays

See Vermont Land Use Planning Implementation Manual, Open Space and Resource Protection Regulations.

Figure 74. Zoning District Overlay Map, Bethel



Flood Hazard Regulations

See Vermont Dep't Housing and Community Affairs, Community Planning For Flood Hazards.

See Vermont Agency of Natural Resources, VT Model Flood Hazard Area Regulations, Fluvial Erosion Hazard Municipal Guide & VT Model Fluvial Erosion Hazard Overlay District.

Stormwater Management and Erosion Control

See ANR, VT Stormwater Management Manual (Vols. 1 & 2).

Low Impact Design (LID) practices can be used to reduce run off. Most of these practices are appropriate for growth centers. Some, such as the elimination of curbs restricting sidewalks to one side of the street, will not be useful practices in the growth center core. Community open space, however, can serve the dual purpose of public open space and stormwater management, if well designed and planted to be both attractive and functional.

Figure 75. Stormwater Basin at UVM

A municipality with a functioning stormwater collection system can examine its current impact on the waterways of their community and region. Expansion of the system with new storm lines and/or additional run-off generated by new growth and increased density can be balanced with efforts to encourage dual purpose green space that allows on-site infiltration, adds amenity and value to new development and relieves the burden and impact on the stormwater collection system and the local waterways

Figure 76. Water Resources Map, Ferrisburgh

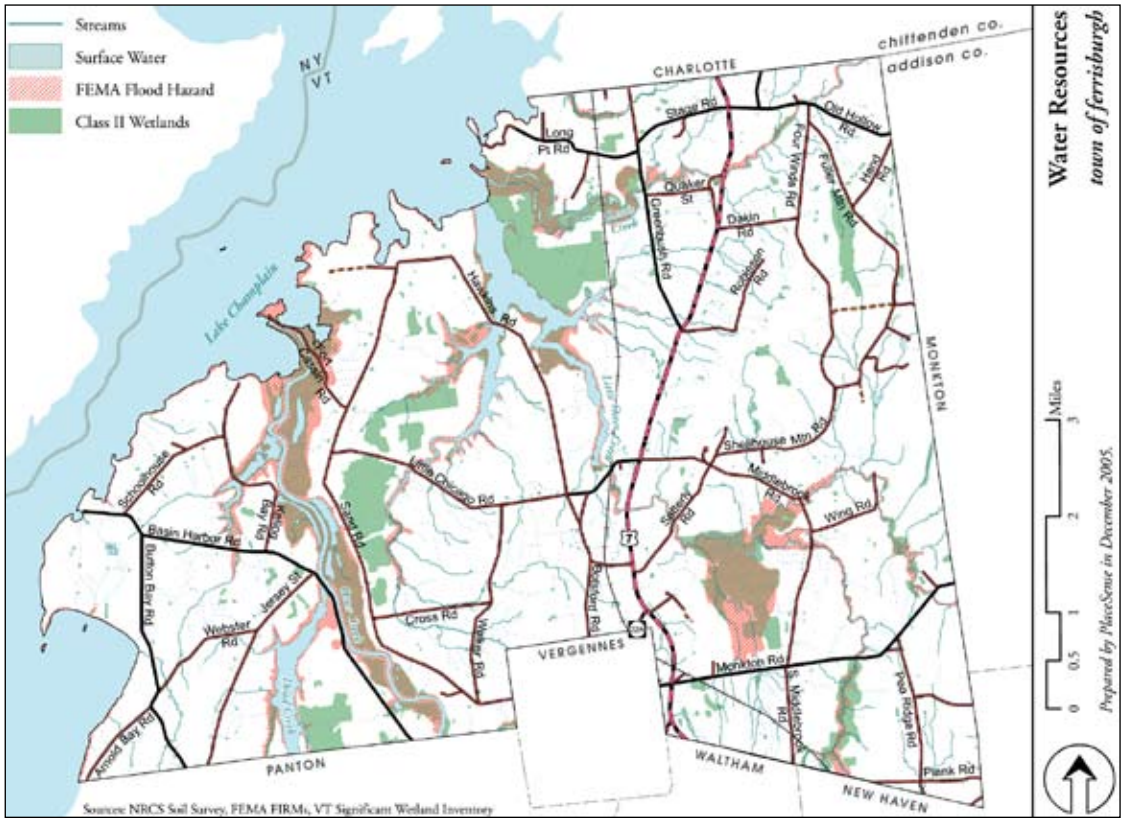


Figure 77. Low-Impact Design Stormwater Management Techniques

Planted islands in parking lots can serve to slow stormwater runoff and filter out sediment and contaminants. Many plants and trees can help the process as well as provide shade and color.

Together with narrow roadways, Rain Gardens (small bio-retention areas) that infiltrate roof run-off can significantly reduce the stormwater burden of new residential neighborhoods.

Gardens and green space are arranged to collect roof water from this cluster of small homes on a compact site.

Early planning for new roads and other green space within a growth center can incorporate bio-detention and bio infiltration areas that lessen stormwater impact.

Resources

State Agencies

Agriculture, Food & Markets

116 State Street
Montpelier, VT 05620
Phone: (802) 828-2416
Web: http://www.vermontagriculture.com

Commerce & Community Development

National Life Building North, Drawer 20
Montpelier, VT 05620
Phone: (802) 828-3211
Web: http://www.dca.state.vt.us

Dep't of Economic Development

National Life Building, Drawer 20
Montpelier, VT 05620-0501
Phone: (802) 828-3080
Web: http://www.thinkvermont.com

Dep't of Housing & Community Affairs

National Life Building, 6th Floor, Drawer 20
Montpelier, VT 05620
Phone: (802) 828-3211
Web: http://www.dhca.state.vt.us

- Housing Division
- Brownfields Initiative
- Land Use Planning
- Community Development
- Historic Sites
- Historic Preservation
- Downtown Program

Human Services

103 South Main Street
Waterbury, VT 05671-0204
Phone: (802) 241-2220
Web: http://www.humanservices.vermont.gov

Natural Resources

103 South Main Street, Center Building
Waterbury, VT 05671-0301
Phone: (802) 241-3600
Web: http://www.anr.state.vt.us

Dep't of Environmental Conservation

One South Building
103 South Main Street
Waterbury, VT 05671-0401
Phone: (802) 241-3808

Air Quality: (802) 241-3840
State Geologist: (802) 241-3608
Wastewater Management: (802) 241-3822
Water Quality: (802) 241-3770

- Lakes & Ponds
- River Management
- Stormwater
- Wetlands

Water Supply: (802) 241-3400

- Source Water Protection
- Drinking Water Quality

Dep't of Fish and Wildlife

10 South Building
103 South Main Street
Waterbury, VT 05671-0501
Phone: (802) 241-3700

Natural Heritage Program: (802) 241-3700

Dep't of Forest, Parks and Recreation

8, 9 & 10 South Building
103 South Main Street
Waterbury, VT 05671-0601
Phone: (802) 241-3670
Fax: (802) 244-1481

Forestry: (802) 241-3678
State Parks: (802) 241-3655
Lands: (802) 241-3693

County Foresters

Addison County: (802) 388-4969
Bennington County: (802) 375-1217
Caledonia & Essex Counties: (802) 751-0110
Chittenden County: (802) 879-5694
Franklin & Grand Isle Counties: (802) 524-6501
Lamoille County: (802) 888-5733
Orange County: (802) 476-0173
Orleans County: (802) 334-7325
Rutland County: (802) 483-2730

Washington County: (802) 476-0172
Windham County: (802) 257-7967
Windsor County: (802) 296-7630

ANR Regional Offices

Barre Regional Office
5 Perry Street
Barre, VT 05641
Environmental Conservation: (802) 476-0190
Fish and Wildlife: (802) 476-0199
Forest, Parks and Recreation: (802) 476-0170

Barre Regional Office
111 West Street
Essex Junction, VT 05452
Environmental Conservation: (802) 879-5656
Fish and Wildlife: (802) 879-1564
Forest, Parks and Recreation: (802) 879-6565

Rutland North Regional Office
271 North Main Street, Suite 215
Rutland, VT 05701
Fish and Wildlife: (802) 786-0040
Forest, Parks and Recreation: (802) 786-0060

Rutland Regional Office
450 Asa Bloomer State Office Building
88 Merchants Row
Rutland, VT 05701-5903
Environmental Conservation: (802) 786-5900

Springfield Regional Office
100 Mineral Street
Springfield, VT 05156
Phone: (802) 885-8855

St. Johnsbury Regional Office
1229 Portland Street, Suite 201
St. Johnsbury, VT 05819-2099
Environmental Conservation: (802) 751-0130
Fish and Wildlife: (802) 751-0100
Forest, Parks and Recreation: (802) 751-0110

Transportation

One National Life Drive
Montpelier, VT 05633-5001
Phone: (802) 828-2657
Web: http://www.aot.state.vt.us

Program Development Division

One National Life Drive, Drawer 33
Montpelier, VT 05633-5001
Phone: (802) 828-2685

- Construction
- Engineering Services
- Environmental Section
- Local Transportation Section
- Materials and Research
- Pavement Management
- Right-of-Way
- Roadway, Traffic & Safety
- Structures

Operations Division

National Life Building, Drawer 33
Montpelier, VT 05633-5001
Phone: (802) 828-2709

- Maintenance
- Public Transit
- Rail
- Aviation

Policy and Planning Division

One National Life Drive, Drawer 33
Montpelier, VT 05633-5001
Phone: (802) 828-3441

- Statewide Planning
- Regional Planning
- Strategic Planning
- Highway Research
- Mapping
- Traffic Research

VTrans District Offices

Bennington: (802) 447-2790
Dummerston: (802) 254-5011
Rutland: (802) 786-5826
White River Junction: (802) 295-8888
Colchester: (802) 655-1580
Berlin: (802) 828-2691
St. Johnsbury: (802) 748-6670
St. Albans: (802) 524-5926
Derby: (802) 334-7934

Natural Resources Board

National Life Records Center Building, Drawer 20
Montpelier, VT 05620
Phone: (802) 828-3309
Web: http://www.nrb.state.vt.us

Regional Planning Commissions

Addison County RPC

79 Court Street
Middlebury, VT 05753
Phone: (802) 388-3141
Web: http://www.acrpc.org

Bennington County RPC

PO Box 342
Arlington, VT 05250
Phone: (802) 375-2576
Web: http://www.rpc.bennington.vt.us

Central Vermont RPC

26 State Street
Montpelier, VT 05602
Phone: (802) 229-0389
Web: http://www.centralvtplanning.org

Chittenden County RPC

30 Kimball Avenue, Suite 206
South Burlington, VT 05403
Phone: (802) 846-4490
Web: http://www.ccrpcvt.org

Chittenden County MPO

30 Kimball Avenue, Suite 206
South Burlington, VT 05403
Phone: (802) 660-4071
Web: http://www.ccmpo.org

Lamoille County RPC

PO Box 1009
43 Portland Street
Morrisville, VT 05661-9786
Phone: (802) 888-4548
Web: http://www.lcpcvt.org

Northeastern Vermont Development Assoc.

PO Box 630
44 Main Street
St. Johnsbury, VT 05819
Phone: (802) 748-5181
Web: http://www.nvda.net

Rutland RPC

PO Box 965
Rutland, VT 05661-9786
Phone: (802) 775-0871
Web: http://www.rutlandrpc.org

Southern Windsor County RPC

PO Box 320
Ascutney, VT 05030
Phone: (802) 674-9201
Web: http://www.swcrpc.org

Two Rivers - Ottauquechee RC

The King Farm
Woodstock, VT 05091
Phone: (802) 457-3188
Web: http://www.trorc.org

Windham RC

139 Main Street, Suite 505
Brattleboro, VT 05302
Phone: (802) 257-4547
Web: http://www.rpc.windham.vt.us

Other Agencies and Organizations

USDA Rural Development

City Center, 3rd Floor
89 Main Street
Montpelier, VT 05602
Phone: (802) 828-6080
Web: http://www.ruraldev.usda.gov/vt/

NRCS District Offices

Addison County: (802) 388-6746
Bennington County: (802) 442-2275
Caledonia & Essex Counties: (802) 748-3885
Chittenden County: (802) 878-7402
Franklin & Grand Isle Counties: (802) 524-6505
Lamoille County: (802) 888-4965
Orleans County: (802) 334-8325

Rutland County: (802) 775-7192
Washington County: (802) 828-4493
Windham County: (802) 254-5323
Windsor & Orange Counties: (802) 295-1662

U.S. Environmental Protection Agency

New England Regional Office
Phone: (888) 372-7341
Web: http://www.epa.gov

National Main Street Program

National Main Street Center
National Trust for Historic Preservation
1785 Massachusetts Avenue, N.W.
Washington, DC 20036
Phone: (202) 588-6219
Web: http://www.mainst.org

The Preservation Trust of Vermont

104 Church Street
Burlington, VT 05401
Phone: (802) 658-6647
Web: http://www.ptvermont.org

Vermont Trails and Greenways Council

VT Department of Forests, Parks & Recreation
103 South Main Street, Building 10 South
Waterbury, VT 05671-0601
Phone: (802) 241-3683
Web: http://www.vttgc.org

Vermont Recreation & Parks Association

721 Main Street
Colchester, Vermont 05446
Phone: (802) 878-2077
Web: http://www.calcaminedesign.com/vrpa

Vermont Housing and Conservation Board

149 State Street
Montpelier, VT 05602
Phone: (802) 828-3250
Web: http://www.vhcb.org

Vermont Local Roads Program

Saint Michael's College
One Winooski Park, Box 260
Colchester, VT 05439
Phone: (802) 654-2652
Web: personalweb.smcvt.edu/vermontlocalroads

Vermont Forum on Sprawl

110 Main Street
Burlington, VT 05401
Phone: (802) 864-6310
Web: http://www.vtsprawl.org

Data Sources

VT Center for Rural Studies

207 Morrill Hall
University of Vermont
Burlington, VT 05405
Phone: (802) 656-3021
Web: http://crs.uvm.edu

VT Center for Geographic Information

58 South Main Street, Suite 2
Waterbury, VT 05676
Phone: (802) 882-3000
Web: http://www.vcgi.org

Vermont Planning Information Center

Web: http://www.vpic.info/

U.S. Census Bureau

Web: http://www.census.gov

U.S. Bureau of Labor Statistics

Web: http://www.bls.gov

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Commercial and Industrial

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Economic Development

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Housing

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Transportation

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Hank Dittmar, et al. The New Transit Town, Best Practices in Transit Oriented Development; 2004.

Elizabeth Humstone et al., Access Management Guidebook; 1996

U.S. Environmental Protection Agency, Parking Spaces - Community Places: Finding the Balance through Smart Growth Solutions; 2006.

Institute of Transportation Engineers, Trip Generation Manual.

Susan Handy et al., Planning for Street Connectivity: Getting from Here to There (PAS Report 515); 2003.

Recreation

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Natural Resources

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Stormwater

VT Agency of Natural Resources, Vermont Stormwater Management Manual (2 volumes).

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Floodways

VT Department of Housing and Community Affairs, Community Planning for Flood Hazards; 1998.

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Historic Resources

National Park Service, Secretary of the Interior's Standards for Rehabilitation (36 CFR Part 67).