

SHUTESBURY MASTER PLAN

JUNE 2004



Prepared by the

**SHUTESBURY MASTER
PLANNING COMMITTEE**

**FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS
PLANNING DEPARTMENT**

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MASTER PLAN

EXECUTIVE SUMMARY

Introduction

The Shutesbury Master Plan is a long-range planning document to guide development in Shutesbury in a way that supports its residents' vision for the future. The Master Plan is a comprehensive report that examines and evaluates many characteristics of Shutesbury, including natural resources and open space, community facilities and services, housing, historic and scenic resources, economic development, transportation, and land use and zoning.

The Master Plan was developed by Shutesbury residents over the past four years. During fall 2000, the Master Planning Committee conducted a survey of Shutesbury landowners and residents. The Committee mailed a total of 1,275 surveys, 331 of which were returned for a response rate of 26 percent. In spring 2001, the Master Planning Committee developed an analysis of the survey results. In spring 2002, the Committee developed a set of Master Plan Goals and Objectives from the results' analysis (*see the Appendix A*).

Beginning in fall 2002, the Master Planning Committee examined inventories and maps of Shutesbury's resources, potential issues and threats, and developed recommendations that will best support the town's goals and vision. The planning process involved the direct input of over forty residents and town officials. Between fall 2002 and spring 2004, the Master Planning Committee convened twenty public meetings to discuss draft chapters and geographic information systems (GIS) maps developed by the Franklin Regional Council of Governments Planning Department as well as by town officials and volunteers. For example, David Ames, the Town Administrator and Leslie Bracebridge, the Town Clerk were responsible for the Transportation Chapter and the Historic and Scenic Resources Chapter, respectively. Shutesbury resident Janice Stone created up-to-date land use and open space GIS data layers for the Master Plan maps.

The purpose of this Executive Summary is to present highlights of the Shutesbury Master Plan. The Master Plan is organized into seven main chapters, each of which discusses one aspect of the community's resources and infrastructure. For each topic, the Executive Summary presents goals, key findings of the inventory and analysis, and recommendations.

It is important to note that the Shutesbury Americans with Disabilities Act (ADA) Committee was in the process of completing an ADA Transition Plan for the town as the Master Plan was being completed. Master Planning Committee members agreed that the

completed and Town Meeting-endorsed Transition Plan should be included in Appendix E in this Master Plan.

Natural Resources and Open Space

Goals:

- To maintain and protect natural resources and ecosystems including clean drinking water supplies, clean air, lake and stream water quality, large forested areas, open fields, wildlife and their habitat areas, and wetlands including vernal pools.
- To preserve the rural character by protecting large blocks of contiguous forestland, fields, and other open space from development and by promoting sustainable forestry, agricultural, and other resource-based activities.

Key Findings:

- Between 1971 and 2002, Shutesbury experienced a loss of 542 acres of forest and an increase of 533 acres of residential development.
- In 1999, the Massachusetts Natural Heritage and Endangered Species Program (NHESP) designated Lake Wyola as an area that contains rare wetlands wildlife and as a priority habitat area that includes unique habitat features.
- The Town of Shutesbury contains two Class A surface water sources: Atkins Reservoir and the Quabbin Reservoir.
- According to the United States Geological Survey (USGS) and MassGIS there are low-to medium yield aquifers located in the vicinity of the following water bodies: Lake Wyola and Ames Pond; Dudleyville marsh; West Branch of the Swift River; Roaring Brook; and, Dean Brook.
- According to the 2000-2001 Natural Heritage and Endangered Species Atlas, several rare species habitats are located within Shutesbury: along Atherton Brook and within the Quabbin Watershed; lands surrounding the Atkins Reservoir on the western border with the Town of Amherst; in the southwestern-most corner of Shutesbury on its border with Amherst and Pelham; and along Roaring Brook near Pratt Corner Rd.
- The NHESP's BioMap, which identifies the areas most in need of protection in order to protect the native biodiversity of the Commonwealth, shows Core Habitat areas covering approximately 7,315 acres or 42 percent of the town. Vegetation that is

considered by NHESP to support the biodiversity value of Core Habitats areas covers another 3,077 acres or 18 percent of the town. The largest Core Habitat area is located within the Quabbin Watershed (6,794 acres or 93% of all the Core Habitat area). The Core Habitat area in Shutesbury, other than that of the Quabbin sub-watershed, is located in the Roaring Brook sub-watershed, northwest of the intersection of Montague Road and Leverett Road. Conserving the long-term biodiversity of Shutesbury will likely require protecting the BioMap Core Habitat areas, the supporting natural landscapes, (plus any additional rare species habitats and special or unique communities and features not identified in the BioMap project), and the lands that link them across a regional landscape.

- Areas of contiguous forest, unbroken by paved roads, power lines, or development have a higher habitat value for wildlife populations, which require deep forest cover. There are portions of two, 10,000+-acre blocks of contiguous forest areas in town: One stretches north of Cooleyville Road and east of Wendell Road into southeastern Wendell and northwestern New Salem. Another lies southeast of Rte. 202 and runs into New Salem. This large southeastern forest block is also in the Quabbin Sub-watershed and is considered a Core Habitat area. Another large block of contiguous forest (5,000 –10,000 acres in size) lies west of Montague Road. This forest block includes Brushy Mountain, the area in Shutesbury known as the Plains, and the only Core Habitat Area in Shutesbury outside of the Quabbin Sub-watershed.
- Approximately 5,555 acres (32 percent of town) of woodlands in Shutesbury are privately owned, undeveloped and unprotected, and are managed for forest products (i.e., sawlogs and firewood).

Recommendations:

- The Select Board and the Board of Assessors should support the Assessor's Clerk to continue to correct and update the Assessor's Geographic Information System (GIS) parcel information so that accurate maps can be created, which would help the town most effectively implement its natural resource protection and land conservation objectives.
- Explore working with a professional planner to support the Conservation Commission and Planning Board when a specific need has been identified.
- Determine the feasibility of acquiring town land and/or adopting an aquifer protection overlay district to conserve potential sources of community drinking water supplies in Shutesbury.
- The Board of Health should continue to map the locations of private wells in relation to road right-of-ways, leach fields, and other potential sources of water contamination as a means of drawing attention to the relative vulnerability of our private wells to pollutants.

- Encourage the Shutesbury Conservation Commission to work in cooperation with the Board of Health to ensure that rivers, streams, lakes and ponds not under the direct authority of the Amherst Public Works Department and the Metropolitan District Commission are monitored for water quality.
- Support the Conservation Commission to continue to proactively negotiate land protection in Shutesbury and to use the publicity of projects to promote and build the Conservation Trust Fund.
- The Recreation and Open Space Committee should continue to apply identified criteria/priorities of open space acquisition to opportunities that may arise, especially via the Chapter 61 right-of-first-refusal, so as to provide the town a rating of the parcel's relative desirability of protection.
- The Recreation and Open Space Committee should encourage private efforts and investment in land protection, especially when the land in question can be characterized as meeting the open space acquisition criteria.
- The Planning Board, in collaboration with the Conservation Commission, Recreation and Open Space Committee and the Board of Health, should establish a rural conservation overlay district for critical resource areas, which would have conservation development design as the preferred development option.
- The Shutesbury Recreation and Open Space Committee should continue to plan, develop, and maintain trail linkages over land and water to enhance the recreational experiences of residents.
- The Shutesbury Recreation and Open Space Committee should continue to provide information on Chapter 61, conservation restrictions, and other land protection methods to all landowners especially those with parcels in critical resource areas.
- The Shutesbury Recreation and Open Space Committee should continue to promote open fields for scenic and wildlife habitat purposes through educational offerings to landowners and residents.

Economic Development

Goal:

- To explore and potentially promote small home business and commercial uses including arts and crafts, bed & breakfasts, professional offices and services, retail, forest/farm-based operations and light industrial development compatible with the Town's environment and rural character that will provide new employment opportunities and contribute tax revenues.

Key Findings:

- According to 1990 and 2000 Census data, Shutesbury has a significantly higher proportion of residents with a bachelor's degree or graduate/professional degree, than the County or the State.
- In 1999, the median household income for Shutesbury was \$60,437, which was higher than the County (\$40,768) and the State (\$50,502) figures. In fact, the Shutesbury median household income in 1999 was the second highest in the twenty-six towns in Franklin County, below only neighboring Leverett (\$73,333).
- In Shutesbury and neighboring towns, the percentage of workers who work at home has increased since 1990.
- Shutesbury has a high percentage of the labor force employed at home, and this rate is increasing. In 1990, there were fifty-one workers identified as working at home. The number grew to ninety-four in 2000, which represents 9 percent of the total workers in Shutesbury working out of the home. Also according to 2000 Census data, 16.6 percent of all workers were self-employed. This is a very high rate of self-employed compared to 9.8 percent in Franklin County and 6.4 percent in Massachusetts.
- Resources to assist entrepreneurs are vital to help home-based businesses and cottage industries become established and grow.

Recommendations:

- Create a town committee to support the strengths, address the challenges, and execute the tasks necessary to encourage entrepreneurship and business development in Shutesbury (as outlined in this chapter).
- Implement strategies to support entrepreneurship and business development among home-based businesses including a business survey, small business network development, and business incubator space.
- Conduct a feasibility study to determine the potential to develop business ventures that would create revenue for the Town, by leasing municipally owned land, by municipal ownership and operation, or by private sector contribution to the tax base.
- Continue to advocate for advanced telecommunications broadband services to be made available in the community.
- Promote a campaign to encourage the buying of local goods and services.

Housing

Goals:

- To encourage a mix of housing densities, ownership patterns, prices, and building types to serve diverse households consistent with the rural character of the community.
- To provide fair, decent, safe, affordable elderly housing that meets the needs of Shutesbury's seniors and which also contributes to the tax base.
- To provide financial assistance to homeowners for State regulations, and encourage compliance with Board of Health Code with respect to Title 5 septic system upgrades, the removal of lead paint, etc.

Key Findings:

- Shutesbury has experienced tremendous growth during the past three decades. In 1970, the town had 489 residents. By 2000, its population had grown to 1,810 (U.S. Census), an increase of 270 percent in 30 years. The main factor behind Shutesbury's population growth has been a large in-migration of new residents seeking to experience the town's high quality of life, including its good schools, and nearby job opportunities. Shutesbury experienced much more housing growth than Franklin County and Massachusetts overall between 1980 and 2000. During the twenty-year period, the number of homes in both Franklin County and in Massachusetts overall increased by 19 percent, compared to 51 percent for Shutesbury.
- According to the 2000 U.S. Census, almost 60 percent (58%) of the homes in Shutesbury have been built since 1970, and only 15 percent of the town's homes were constructed before 1940.
- Shutesbury has a relatively large percentage of homes with seasonal or occasional residents; these homes represent 16 percent (131 units) of the town's total housing stock (2000 U.S. Census). In contrast, countywide, such units only account for 3 percent of all housing. It is estimated that approximately half the homes at Lake Wyola are now used as year-round residences, and that more will be converted to year-round use in the coming years.
- During the 1990s, the number of households in Shutesbury with children under 18 grew by 20 percent, while in Franklin County overall, the number of these households decreased by 3 percent.

- It is estimated that by 2025, Shutesbury’s population may grow to approximately 2,600, adding approximately 800 new, year-round residents over its current (2000) population of 1,810.
- It is estimated that 13 percent of Shutesbury households are low income, 15 percent are moderate income, 36 percent are middle income, and 36 percent are upper income.
- A household of moderate income earning \$30,000 annually (\$2,500 per month) can find homes that are affordable in Shutesbury, though they are less common. A household with a \$30,000 annual income can afford to spend approximately \$750 per month on housing costs. Such a household could afford to buy a home valued at \$83,000 or less. According to the 2000 Census, 4 percent of homes (20 homes) in Shutesbury have values below \$80,000 and 6 percent (32) have values below \$90,000.
- Overall, the available data shows that housing in Shutesbury is affordable for most residents. At the same time, however, it is also true that over one fourth (27%) of households have unaffordable housing costs when comparing median housing costs to gross income. Of this group, slightly more than a third are severely cost-burdened, using over half their incomes on housing.
- One major factor contributing to burdensome housing costs for low and moderate-income households are increasing property taxes. Between 1990 and 2002, the average annual property tax for a single-family home in Shutesbury increased almost \$1,700 (113%), from \$1,494 (1990) to \$3,184 (2002) as compared to a 71% increase statewide. For Shutesbury residents, an average annual property tax of \$3,184 is equivalent to \$265 per month. For low-income residents in Shutesbury and elsewhere, the increasing amount of incomes spent on property taxes, along with other rising housing costs, threatens the affordability of their current housing options.

Recommendations:

- Promote the housing rehabilitation loan program among residents, especially seniors, with low and moderate-incomes who do not have the financial resources to fund home improvements and repairs on their own, including accessibility improvements, septic system upgrades, and radon, asbestos, and UFFI mitigation. Use the housing rehabilitation loan program to help maintain and preserve Shutesbury’s current affordable housing stock.
- Pursue public grants and other funding sources to encourage the development of affordable housing for seniors, at an appropriate scale for the community. Work with HRA to access these potential funds.

- Review the town’s zoning ordinances and consider changes that could encourage more housing options for seniors, including accessory apartments and senior housing.
- Continue to investigate which parts of town may be the most suitable for new housing development, such as senior housing or affordable housing combined with cluster housing. Encourage future growth to occur in those areas. Consider dividing the town’s one zoning district into different districts, which would allow different levels of housing development and density as appropriate.
- Consider revising the town’s zoning ordinances to include overlay districts that protect sensitive environmental, scenic, and historic areas from residential development patterns that could be detrimental to these assets.
- Work with legislators to encourage the State to continue revising Chapter 40B to provide additional flexibility and local control in the creation of long-term affordable housing, and to expand its definition of “affordable.”
- Develop additional ways to reduce the housing cost burdens for seniors and other residents on fixed incomes. Such strategies could include allowing residents to volunteer for the town in exchange for a partial abatement of property taxes.

Community Facilities and Services

Goals:

- To continue to provide excellent police, fire, and ambulance service, solid and hazardous waste management, highway maintenance, library and recreational facilities, and elementary school education services.
- To plan and coordinate the provision of community facilities and services in an appropriate and cost efficient manner, which should be done in coordination with capital improvement planning.

Police and Emergency Fire and Medical Key Findings:

- According to the Police Chief, office space and staffing are two long-term program needs that need to be addressed so that the Department can maintain the current level of service.
- According to the current Fire Chief, it has become more and more difficult to sustain a full cadre of experienced firefighters over time. This is in part due to the difficulty of recruiting and training volunteer firefighters, the burden of keeping up with

training needs, and other associated issues related to providing municipal emergency services via volunteers.

- According to the current Fire Chief, the Department has been able to deal with budget cuts due to their frugality with some types of equipment spending and because they have succeeded at attracting grant funding. For the short-term, the Department will be able to maintain a level of service expected by residents. Although equipment and space needs are adequate today (2003), the department may need a new brush truck, tanker, and a trailer for the HAZMAT equipment they currently have, which would likely require another garage bay or two.
- According to the Shutesbury Fire Chief, the Amherst Fire Department does a good job providing emergency medical services to Shutesbury residents. To shorten the response time to some locations in town, the Town of Shutesbury would have to fund local paramedic-level service, which would require two full-time personnel and at least one ambulance to guarantee service.

Police and Emergency Fire and Medical Recommendations:

- The community should develop a feasibility study that includes a comparison of needs versus services, which could also focus on determining appropriate solutions for any Police Department space and staffing issues.
- The community should resolve Shutesbury Fire Department training, recruitment, and retention issues with the help of a Select Board-appointed Ad hoc Committee.
- Establish a fund to help pay for ambulance services for people without health insurance.
- Review the Shutesbury Emergency Management Plan and use it as a tool to strengthen communication among town officials, boards, departments, and committees.

Recycling and Solid Waste Disposal Key Finding:

- Because Shutesbury's curbside recycling rate slipped from 37 percent in 2002 to 34 percent in 2003, town officials may want to work more with the Recycling and Solid Waste Committee to encourage residents to recycle and compost more of their household solid wastes.

Recycling and Solid Waste Disposal Recommendations:

- Promote environmentally proper composting more aggressively to reduce the amount of curbside solid waste to be hauled.
- Educate students about hazardous wastes in school or via the website more effectively.
- Encourage participation in the hazardous material days each year.
- Promote the use of non-hazardous alternative products.
- Encourage source reduction through articles in the *Our Town* newsletter and the town's website.
- Review the bylaws to consider ways of prohibiting the storing of more than two, non-registered vehicles on land under one ownership.
- Increase the unit cost for residents' purchase of trash bags beyond the fifty-count provided to encourage composting and recycling.

Recreational and Cultural Facilities and Services Key Findings:

- The Town of Shutesbury contains over twenty recreational resources or recreational areas including Shutesbury State Forest, Carroll Holmes Recreation Area, Lake Wyola, Town launch area, the South Brook Conservation Area, Town Common, Town soccer field behind the Fire Station, Town playfield behind the Town Hall, Town Elementary School field and woods, Town of Amherst watershed lands, Quabbin Watershed lands, Shutesbury Athletic Club, Morse Hill, Robert Frost Trail and Metacomet and Monadnock Trail, Garbiel Gift, Lake Wyola Island, Temenos, Sirius community, Snowmobile Trails, and Lake Wyola Association Beaches and Pavilion.
- According to the 2002 Annual Report, the Library is used by over half the households in town at least once per month, which places it within the top ten of all libraries in Massachusetts towns of 2000 people or less in terms of circulation, patron visits, and attendance at events.
- Though some retirees use the library frequently, older and disabled seniors have difficulty negotiating the parking area and the stairs.
- With a 2000 population (U.S. Census) of 1,810, Shutesbury should have a library with a minimum of 3,600 square feet. The present building has 900 square feet.

Recreational and Cultural Facilities and Services Recommendations:

- The Recreation and Open Space Committee could form a Trails Subcommittee.
- Develop the Fire Station soccer field as the town's main sports field facility.
- Promote afternoon and weekend use of the Shutesbury Elementary School Playground.
- Build a new library.
- Support the Council on Aging to survey seniors in town to determine which recreational and cultural services would be most desirable.
- Investigate potential alternative meeting spaces for seniors including the Elementary School and the Shutesbury Athletic Club.

Highway Department Key Findings:

- The approximate space needs equal, at a minimum, 150 percent of the Highway Department's current lot, or 3.5 acres.
- Expanding the garage to the south towards Leverett Road is constrained by the front yard setback, to the north by wetland, and the land to the west and east of the garage is currently used for storage, while the salt shed out front may already be within the twenty-five foot side yard setback.
- The Highway Department is currently in need of three pieces of equipment: a flatbed trailer, a flail or rotary mower attachment for the tractor, and a brush chipper.

Highway Department Recommendations:

- The community should develop a plan to address the Highway Department's space needs with the assistance of a Select Board-appointed Ad hoc Committee.

Community Facilities and Services Expansion Key Findings:

- Community wastewater treatment is presently being considered by the Lake Wyola Advisory Committee (LWAC), which is a town committee created by the Select Board), and is an idea that has been endorsed in principle by the Lake Wyola Association (the homeowners' association). LWAC has created a subcommittee to investigate potential wastewater solutions for the area.

- Currently, the Town Center represents the highest concentration spatially of community infrastructure in Shutesbury and includes the Post Office, Library, Town Offices, and Police Department. If a new expanded library gets built in back of the Town Hall, as is proposed in the Conway School of Landscape Design's Town Center Plan, and the existing Spear Library building becomes re-used as meeting space for example, this area could play an even stronger role as the town's cultural and social hub.
- According to Tari N. Thomas, Principal, there are no short-term space needs at the Elementary School. The school's enrollment dropped from 203 to 152 students, not including pre-school children between fiscal year 2002 and 2004. However, over the past decade school enrollment in Shutesbury has increased from 166 students in 1990 to 204 in the year 2000. It is not expected that a new school will be needed in the next 10 years. However, when the time comes for needed expansion, building on the current lot may be constrained by the fact that almost the entire property is located within the school's drinking water supply's wellhead protection area.
- The town contains several recreational fields of varying conditions: Fire Station, Elementary School, and to a much lesser degree, in back of the Town Hall. The Elementary School field, while adequate for some sports would require renovations that are constrained by the field's proximity to the school's water supply. The Fire Station field appears to be the best choice for investment as a sports field complex.

Community Facilities and Services Expansion Recommendations:

- Support the Lake Wyola Advisory Committee (LWAC) in its investigation of potential wastewater solutions for the Lake Wyola area.
- Actively maintain and manage the town-owned parcels in and around Lake Wyola in their current undeveloped states.
- The Recreation and Open Space Committee may want to consider potential future water supply areas as a criterion for open space protection.
- The Select Board should survey the existing and potential future space needs of all existing boards, committees, departments and commissions.
- The community could explore the potential for the Shutesbury Elementary School to have an expanded role in support of town activities and functions.

Transportation

Goals:

- To maintain the condition of the road system in a manner that is compatible with Shutesbury's rural character.
- To maintain the pedestrian infrastructure.
- To maintain traffic patterns at key locations.
- To expand transportation choices for Shutesbury residents.

Key Findings:

- The town is responsible for the maintenance of 31.15 roadway miles, the majority of which are classified as Rural Local.
- Currently the town maintains these roads with three full-time crewmembers and uses part-time help for winter maintenance.
- Of the 31.15 road miles maintained by the Shutesbury highway department, 15.7 miles (just over half) are gravel roads. Although the town spends only about \$30,000 per year in materials for these roads, they are very resource intensive to maintain. Gravel road issues will need to be addressed using maximum participation from the town in order to balance the many competing demands on town resources and to address concerns about the nature of Shutesbury.
- Based on accident analysis data, there are no sections of road that seem to be more dangerous than others.
- As part of the Footprint Road Program Application for the Leverett/Cooleyville/Prescott Roads reconstruction, a Level of Service (LOS) analysis was conducted. There are six LOS definitions, assigned letters A through F, where A represents the best operating conditions and F the worst. Leverett Road was assigned a LOS B rating and Cooleyville/Prescott Roads assigned a LOS A rating.
- Shutesbury currently has only one sidewalk, which is located along the elementary school driveway stretching from the school to West Pelham Road (approximately 400 feet). There are some heavy pedestrian traffic areas in the town center, however the roads do have wider gravel shoulders to allow for pedestrian traffic near the post office and town hall.

- Based on the results of a survey in 2001, town officials could not justify the costs of a public transit service at this time though the bus and rail passenger service from Amherst seems to be the most convenient for people living in Shutesbury.

Recommendations:

- Investigate and implement ways to improve pedestrian safety crossing Cooleyville, Leverett and the south side of Wendell roads. Investigate measures or devices to slow vehicle speeds through Town center and along the Prescott/Cooleyville/Leverett roads.
- Investigate using the existing paved and gravel roads as a link for pedestrian and bicycle traffic between Shutesbury Town Center and the Franklin County Bikeway.
- Investigate ways to connect trails that have hiking and bicycling opportunities.
- Maintain a PMS program to help maintain paved roads.
- Develop a Gravel Road Maintenance System.
- Continue support for the G-Link transit service and continue to investigate expanding service to Shutesbury.
- Continue to monitor the shared bridge and seek funding to maintain it. Explore an appropriate means of repair or replacement.
- Encourage the adoption of best management practices in all Town departments, especially for the use of road sand and salt by the highway department.
- Identify the level of road maintenance sought by Shutesbury residents and ensure that any roadway upgrades balance safety considerations with neighboring rural character and town-wide network needs.
- Identify and address the long-term needs of the Highway Department including facilities, equipment and space.
- Identify and implement means to encourage drivers to obey the speed limits posted along all Shutesbury roads.
- Address the issue of paved versus gravel from all aspects including cost analysis, labor, quality of life, town character and traffic load through a means that provides maximum participation of the citizens of Shutesbury. Investigate new methods of gravel road maintenance to determine if there are any better methods.

Historic and Scenic Resources

Goal:

- Identify and protect historical and scenic resources including buildings, sites, and landscapes.

Key Findings:

- Shutesbury’s historical and scenic resources should be regarded as “heirlooms.” They are fragile and non-renewable. Once destroyed, historical and scenic resources are gone forever; they cannot be re-grown, rebuilt, repaired or otherwise brought back to health like many of our natural systems. The fragility of these resources places a value on them that is difficult to calculate.
- Shutesbury would benefit from a comprehensive factual written history of its years following Louis Everet’s 1879 treatment of Shutesbury’s early history, in his History of the Connecticut Valley in Massachusetts.
- The 2001 *Community Documentation Plan* by William Carroll and the 2002 *Historic Resources Survey* are two valuable resources available to aid in the preservation of Shutesbury’s history.
- Some key historical and natural scenic features of Shutesbury are:
 - The Town Common
 - Lake Wyola
 - Mt. Mineral & Ames Pond
 - Baker Reservoir
 - Atkins Reservoir
 - Hearthstone Hill
 - Quabbin Reservoir and Watershed
- Existing archaeological evidence suggests that Paleo Indian hunters and gatherers, the first human inhabitants of the New World, reached the Swift River drainage sometime between 9,500 to 12,000 years ago. According to The Major Tribes of New England ca. 1635 map, at the time of colonial settlement, the Pocumtucks and Nipmucs inhabited the area of Shutesbury.
- Unique primary source records document the people of Shutesbury and the municipal history from 1735 to the present. They have permanent and enduring value to the local and regional history and genealogy.

- The Shutesbury Historical Commission has identified over 20 local Historical Preservation Resource Groups with whom to collaborate on local historical preservation matters.

Recommendations:

- Review and follow-up on the documentation and preservation goals presented in the 2000/2001 William Carroll *Community Documentation Plan* and the companion *Long-Range Historical Records Strategic Plan*.
- Review and follow-up on the recommendations of the August 2002 *Shutesbury Historic Resources Survey* by independent preservation consultant Margaret Hepler.
- Collaboration with local and neighboring preservation groups as listed.
- Seek permanent town ownership of the Old Town Hall, the West Schoolhouse, the Town Hall, and the Spear Memorial Building.
- Promotion of a historic curatorship of the Lodge at Lake Wyola. Ensure preservation of the associated barn by the Department of Conservation and Recreation.
- Compilation of Shutesbury's late 19th and complete 20th century history into a book.
- Collection and preservation of Shutesbury's historic artifacts and documents.
- Collection and preservation of oral interviews.
- Purchase of Franklin County reel #36 of the Corbin Collection that contains a 1931 inventory of cemeteries of Shutesbury.
- Continue to offer public education and activities that promote long-term appreciation and protection of Shutesbury's historical resources.

Land Use and Zoning

Goals:

- To protect the rural character and working landscapes of Shutesbury, while allowing landowners to develop suitable portions of their land.
- To protect the Town's natural resources and open space through appropriate zoning and subdivision measures.

- To encourage small business development in a manner that does not reduce residents' quality of life.
- To develop a system of land-use controls, which will best manage the acceptance of new development in the community.

Key Findings:

- The dominant development pattern in town is single-family homes on approval-not-required (ANR) frontage lots. Overall, 93 percent of Shutesbury's housing is in single-family homes.
- Growth over the next twenty-five years is projected to be 44 percent. Shutesbury's population is projected (by FRCOG) to increase by 44 percent between 2000 and 2025 adding approximately 800 people in up to 320 new dwelling units assuming household size remains constant.
- The development patterns that should be promoted via zoning and non-zoning strategies to be consistent with the Master Plan recommendations and Goals and Objectives include:
 - The retention of large blocks of contiguous (undeveloped) forests;
 - Slow and steady growth in appropriate areas;
 - Clusters of small lots potentially near protected forestland;
 - Roadside development of single-family and two-family dwellings on lots 2 acres in size with 250 feet of frontage;
 - Concentrations of higher density lots in an expanded Town Center;
 - An expanded Town Center area with municipal/civic, small-lot residential, and small commercial business uses along Leverett/Cooleyville Road from Town Center to Pratt Corner Road;
 - Small scale 5-7 unit senior housing development around Lake Wyola, the Town Center area, or other suitable areas;
 - Accessory apartments associated with owner-occupied single-family detached dwellings, allowed in all areas; and,
 - Small home business uses with expanded allowances in all areas.
 - Low density development with appropriate safe guards in the watershed protection and forest conservation overlay districts.

Recommendations:

- The Shutesbury Planning Board develops and seeks to have Town Meeting adopt:
 - *A Phased Growth By-law* to ensure that growth occurs in an orderly and planned manner that allows the town time for preparation to maintain high quality

municipal services for an expanded residential population while allowing a reasonable amount of additional residential growth during those preparations.

- A *Town Center District* promotes residential development at a higher density than is currently allowed in the Rural Residential District and the concentration of existing and future civic uses including police, fire, highway, senior housing, and library uses.
- A *Water Supply Protection Overlay District* for the Atkins Reservoir, Dean Brook and Nurse Brook Sub-watersheds to regulate land uses that threaten surface and groundwater quality.
- A *Forest Conservation Overlay District* for large unprotected blocks of forest in town, which would have conservation subdivision design as the by-right or easiest development option.
- A *Lake Wyola Sub-watershed Overlay District* to address both the need to protect the quality of surface and groundwater within the sub-watershed and Lake Wyola itself, as well as the potential need for establishing equitable land use regulations for the developed portion of the basin.
- A *Transfer of Development Rights (TDR) By-law* to encourage new development in some areas while being discouraged in others.
- A *Conservation Subdivision Design (CSD) By-law* to encourage housing to be grouped on smaller lots, which would result in a large share of the total parcel being protected from development.
- An amendment that promotes the development of accessory apartments.
- A *Major Home Occupations By-law* to encourage the expansion of home business operations in town while regulating utility areas, the number of employees, parking, signage, lighting, and the level of retail activities.
- The Conservation Commission adopts amendments to the local wetlands protection by-laws and regulations that would specifically prohibit the storing outside of more than two, non-registered vehicles.
- The Town directs its Conservation Commission and Recreation and Open Space Committee to adopt a more aggressive and comprehensive approach to the use of land protection as a growth management tool.
- The Shutesbury Select Board appoints a Senior Housing Subcommittee to plan for the development of senior housing in the Town Center, in the vicinity of the new library, near Amherst, near Lake Wyola, or other suitable locations.

- The Planning Board should develop a Fence By-law to protect scenic roadside views and the pastoral nature of our country roads.
- The Town adopts the Community Preservation Act, which allows cities and towns to raise funds for open space protection, historic preservation, and affordable housing by adopting up to a 3 percent surcharge of the real estate tax levy. Monies raised via the surcharge would also receive a state match.

CHAPTER 1

NATURAL RESOURCES AND OPEN SPACE

This chapter, Natural Resources and Open Space, addresses some of the most important assets of the Town of Shutesbury: its forests, plants and animals, meadows, streams, lake, ponds, wetlands, and groundwater. It describes past and potential future land use trends, and presents an overview of Shutesbury's landscape character and a selective inventory of the town's natural resources. The town's extensive natural and open space areas are essential elements in the social and ecological fabric of Shutesbury.

In general terms, 'natural resources' describes the biological and physical components of an ecosystem that people depend on for their existence, their quality of life, and for some, their livelihood. These components are air, geology and topography, soils, surface and ground water, vegetation, fisheries, and wildlife. Two other types of natural resources that could potentially be harnessed for local power generation include solar and wind energy. 'Open space' is defined as being land that is undeveloped, which is valued by residents because of what it provides: wildlife habitat; groundwater recharge protection; public access to recreational lands and trail systems; important plant communities; structures and landscapes that represent a community's heritage; flood control; scenery; actively managed forestland; and a source of personal and spiritual inspiration and renewal.

The quantity, quality, and spatial relationships between Shutesbury's open space and natural resources are identified. Due to the similar subject matter, aspects of the 1999-2004 Shutesbury Open Space and Recreation Plan have been incorporated into the contents of this chapter. Available information related to water quality and the value of other natural resources is presented within a watershed and sub-watershed context, since these areas provide a natural means of understanding the "lay of the land," the interplay of hills, ridges and water, and the relationships of various ecosystem components. Also, sources of pollution upstream have a direct impact on the quality of water, wildlife, and fisheries that move downstream.

In 2001, the Town of Shutesbury developed a community survey, which was distributed to landowners and residents. Nearly 16 percent of the 1,275 surveys mailed out, were returned. The results of the survey demonstrate that Shutesbury residents understand the relationship between the quality of the environment and their own lives, and the need to actively protect air and water quality, remaining fields, forestlands, wetlands and vernal pools. The survey findings were instrumental in shaping the goals and objectives for the Natural Resources and Open Space Chapter of the Master Plan. Although the community survey does not represent the opinions of every resident nor every age and income bracket, it provides the best current assessment of the issues and resources residents believe are most important and worthy of attention.

Goals:

- To maintain and protect natural resources and ecosystems including clean drinking water supplies, clean air, lake and stream water quality, large forested areas, open fields, wildlife and their habitat areas, and wetlands including vernal pools.
- To preserve the rural character by protecting large blocks of contiguous forestland, fields, and other open space from development and by promoting sustainable forestry, agricultural, and other resource-based activities.

Objectives:

- Identify and protect potential aquifers and recharge areas for public drinking water supplies and protect private well water quality.
- Monitor water quality in the rivers, streams, lakes and ponds and develop methods for their protection and improvement where appropriate.
- Develop strategies to increase funding and awareness (and establish a separate, interest bearing account for such funds) for open space protection, management, and acquisition, such as, but not limited to:
 - Land bank;
 - Continue to transfer all funds generated by Chapter 61 forest products tax to the Conservation Trust Fund;
 - Management of town-owned lands for income;
 - Payments in Lieu of Taxes from the Department of Conservation and Recreation and the Town of Amherst; and,
 - Raffles, auctions, sponsored mountain bike/ski/walkathon on trails, and /or fund drives.
- Apply identified criteria/priorities of open space acquisition/protection (i.e., the criteria listed below from the 1999-2004 Open Space and Recreation Plan) to opportunities that may arise, especially via the Chapter 61 right-of-first-refusal, so as to provide the town a rating of the parcel's relative desirability of protection.
 - Open fields and non-forested lands;
 - Important water features including falls, springs, and distinctive or unique wetlands;
 - Rare species habitat (state-listed rare, threatened and endangered) and vernal pools;

- Areas of high visual or aesthetic value;
 - Recreational access and lake, stream and trail node access;
 - Unique or distinctive historic, archaeological or geological features;
 - Threat of development; and
 - Areas that connect or enlarge protected areas and or create conservation corridors.
- As an added safeguard, establish a protocol for the potential transfer of the town's right-of-first refusal to a local conservation land trust so that high priority Chapter 61 open space, under threat of development, may be protected.
 - Identify the most important scenic and recreational areas in town and seek to purchase or otherwise acquire scenic easements (legal documents that represent the transference of ownership rights between parties) from willing landowners to help protect these views from development and/or change.
 - Designate Local Scenic Roads to help protect roadside trees, which contribute greatly to Shutesbury's rural character.
 - Develop and adopt regulations for the town's current local wetlands protection by-law.
 - Support and promote private initiatives to protect open space, natural resources, and forestland including the use of Conservation Restrictions.
 - Actively pursue gifts and bequests of open space lands and Conservation Restrictions.
 - Consider establishing a rural conservation overlay district, which would have conservation development design as the preferred development option.
 - Adopt zoning and subdivision control measures, which will ensure that new residential development occurs at a density appropriate for a rural town.
 - Coordinate the activities of the Shutesbury Conservation Commission and the Recreation Committee to plan, develop, and maintain trail linkages over land and water to enhance the recreational experiences of residents participating in the most popular outdoor activities: walking, hiking, bird watching, bicycling, X-country skiing, canoeing/kayaking/rowing, mountain biking, snow shoeing, running, and snowmobiling. In addition, resolve any use conflicts between motorized and non-motorized users.
 - Proactively seek private owners of significant parcels (i.e., those who own 50 or more acres) and offer such information (previous objective); also, annually thank them for their personal contribution to rural character and outdoor recreation.

- Maintain a current open space map of protected parcels and unprotected parcels, to facilitate decision-making about acquisition or other protection actions.
- Ensure that open space lands are not taxed as developable if they do not have developable lots based on zoning.
- Promote through the use of incentives the protection, enhancement, management, and the maintenance of open fields for scenic and wildlife habitat purposes.

There are three sections included in this chapter: Landscape Character and Land Use; Natural Resources; and Open Space. Landscape Character and Land Use provides context for the rest of the chapter both by describing the town's general landscape forms and by reflecting how uses of land in town have changed over time. The Natural Resources section inventories and analyzes the town's topography, geology, and soils including a discussion of Prime farmland and forestland soils; water resources including surface water, wetlands, and aquifers; vegetation; and, wildlife, fisheries and their habitat. The Open Space section provides an inventory of public and private lands in Shutesbury that are valued for their conservation and recreation resources, and which have some level of protection as undeveloped, open space.

Landscape Character and Land Use

The Town of Shutesbury, an historic lumbering town, is a rural community located in the southeastern corner of Franklin County. Wendell borders Shutesbury on the north, the Quabbin Reservoir and New Salem on the east, Pelham and Amherst on the south and southwest and Leverett on the west. Shutesbury has a total land area of twenty-seven square miles and a landmass of 17,342 acres. Of this total land mass, 16,328 acres or 94.2 percent are undeveloped, 917 acres or 5.3 percent are developed in residential uses, and 368 acres or 2.1 percent are surface water (aerial photo interpretation of Shutesbury, 2002). Located in the northeastern portion of the Pioneer Valley region, the Town of Shutesbury is considered one of the hill towns on the eastern flank of the Connecticut River Valley. It stretches approximately six miles from north to south, and approximately six miles from east to west at the widest point.

The Quabbin Reservoir and its sub-watershed within the Chicopee River Watershed define much of the town's eastern border. This proximity to the Quabbin Reservoir and its protected watershed lands helps the town retain its rural character over time by the fact that much of the land is protected from development. In addition, the Quabbin protected lands serve as a significantly large and little-fragmented wildlife habitat area for large mammals throughout the region as well as a source of recreational opportunities including boating, fishing and hiking. Important historic and archaeological resources are also found in this area, quietly left behind when the reservoir was created and thousands of acres of land were flooded in the 1930s.

The Town of Shutesbury is rich in natural resources, primarily forests, clean water and clean air. In addition to the Quabbin Reservoir, the Atkins Reservoir and its sub-watershed, which serve the Town of Amherst, is also located in town. The high percentage of forested open space in the town functions to protect watersheds, provide wildlife habitat, and conserve the rural landscape with which Shutesbury is identified. Included in this open space are the Quabbin Reservoir lands, Shutesbury State Forest (comprised of two non-contiguous parcels), Lake Wyola State Park, several town conservation areas, and two long-distance recreation trails: the Robert Frost Trail and a section of the Metacomet-Monadnock Trail both of which traverse the southwest corner of town.

Shutesbury’s overall landscape is dominated by steep, heavily forested hillsides that slope to the east, rolling wooded hills and flats to the west, and forested and non-forested wetlands within a landscape that is interspersed with occasional residential development along roadways. The exceptions to this include three areas of relatively dense residential development around Lake Wyola, January Hills, and Shutesbury Center. Shutesbury Center was assessed in the 1992 Franklin County Rural Historic Landscape Preservation Plan as being an example of a crossroad village center, which by National Park Service standards, is considered to be a significant historical community development landscape. Surface waters, such as the Sawmill River, the West Branch of the Swift River, Lake Wyola, Ames Pond, Roaring Brook, other tributary streams, brooks, ponds, and scattered wetlands have important wildlife and scenic value for residents. The drainage of the town is divided into portions of five sub-watersheds, four on the western, Connecticut River side of town, and one on the eastern, Chicopee River (Quabbin Reservoir) side of town (*see Water Resources and Wildlife Habitat Map*). The large amount of protected state-owned lands -- more than 25 percent of total land area, located mostly on the eastern side -- provides this portion of town a measure of relief from the potential increased development pressures that will be experienced in the future.

**Table 1-1: Natural Resource Related Land Use
Acreages in Shutesbury, Massachusetts in 2002**

Land Use	Acres	Percentage of Total Land Area in Shutesbury
Forest (and Forested Wetlands)	15,592	89.91%
Surface Water	368	2.12%
Non-Forested Wetlands	164	0.95%
Pasture	112	0.65%
Cropland	2	0.01%
Total	16,328	93.64%
Total Land Area in Shutesbury	17,342	

Source: MassGIS, Land Use Coverage, 1999 and J. Stone, 2002.

Table 1-1 lists the approximate acreage of selected natural resource related land uses in Shutesbury, according to mapping and data provided by resident and employee of the State’s Executive Office of Environmental Affairs Geographic Information System (MassGIS), Janice Stone. The acreage figures are estimates based upon aerial photo interpretation.

Forestland accounts for approximately 90 percent of the total land area of Shutesbury, which includes approximately 500 acres of forested wetlands. The town also has approximately 164 acres of non-forested wetlands. Surface waters, in the form of lakes, ponds, rivers, and streams, account for approximately 368 acres or 2.1 percent of the total land area. Approximately 112 acres are identified as pasture and two acres as cropland.

Of the total land area of Shutesbury (17,342 acres), the 1,014 acres not in forest, surface waters or pasture are in land uses that constitute the built environment. This includes predominantly single-family residences and a number of two-family homes, institutional uses, the road network, and a small amount of light industrial uses.

Table 1-2 compares the amount of land in housing, forest, and other categories of land uses between 1971 and 2002. The most significant change in that thirty-one year period is the amount of forestland lost to residential development. Overall, 618 acres of forestland was lost mostly to residential uses of a half-acre or more.

Table 1-2: Changes in Land Area of Different Natural Resource and Developed Land Uses Between 1971 and 2002

	Land Use Acreages in 1971	Land Use Acreages in 1985	Land Use Acreages in 1999	Land Use Acreages in 2002	Change in Acreage from 1971 to 2002
Cropland	68	59	60	2	-66
Pasture	82	72	92	112	30
Forest*	16,210	15,958	15,695	15,592	-618
Non-Forested Wetland	88	103	110	164	76
Mining (Gravel, etc.)	7	3	8	6	-1
Open Land (including power lines)	111	121	157	134	23
Participation Recreation	5	5	7	12	7
Water Recreation	3	3	3	3	0
Total Residential Development**	365	572	785	898	533
Industrial	4	13	6	9	5
Urban Open***	20	34	29	26	6
Waste Disposal	5	5	5	10	5
Surface Water	365	378	371	368	3
Orchard/Nursery	9	14	14	6	-3
Total Acreage****	17,342	17,342	17,342	17,342	

*Forest includes forested wetlands, which was a category not defined in land use codes previous to 2002.

Total Residential Development collapses three separate land use categories, which were not used in the 2002 assessment. *Urban Open includes cemeteries, parks, public and institutional green space, and vacant undeveloped land. ****Total acreage for the 2002 assessment was 15 acres less than the other three MassGIS assessments. The 15 acres were therefore added to the total forest acreage as the forestland use type represents the greatest single land use in Shutesbury.

Source: MassGIS Land Use Coverages, 1999 and J. Stone, 2002.

According to an assessment of land use changes using Geographic Information Systems, the prevailing pattern between 1971 and 2002, was the development of individual residential lots of one-half acre or more (current minimum lot size is two acres) located along the roads and on the edge of large blocks of forested land. These frontage lots are a type of residential

development, which does not require Planning Board approval, as does the subdivision of land. Under the Subdivision Control Act, M.G.L. Chapter 41, Section 81K, land may legally be divided through an Approval-Not-Required (ANR) Plan.

Table 1-3: Town of Shutesbury New Dwelling Building Permits Issued 1996-2001

Year	Location	Number of New Dwelling Building Permits	Number of New Dwelling Building Permits Per Year
1996	Montague Road	2	
	Wendell Road	1	
	January Hills Rd	1	
	Total for 1996		4
1997	Locks Pond Rd.	1	
	Town Farm Rd.	1	
	Sand Hill Rd.	1	
	Total for 1997		3
1998	Montague Rd.	1	
	West Pelham Rd.	2	
	Old Orchard Rd.	2	
	Lake Drive	1	
	Sumner Mtn. Rd.	1	
	Cooleyville Rd.	1	
	Wendell Rd.	2	
	Leonard Rd.	1	
	Total for 1998		11
	1999	Ames Haven Rd.	1
Wendell Rd.		1	
Baker Rd.		1	
Total for 1999			3
2000	Montague Rd.	1	
	West Pelham Rd.	1	
	Cooleyville Rd.	1	
	Locks Pond Rd.	1	
	Wendell Rd.	1	
	Wendell Rd.	1 Two Family	
Total for 2000		6	
2001	Locks Pond Rd.	1	
	Wendell Rd.	1 Two Family	
	Wendell Rd.	2	
	Pelham Rd.	1	
	Old Egypt Rd.	1	
	Total for 2001		6

Source: Town of Shutesbury Building Permit Files, 1996-2001.

An ANR plan may create a lot if the new lot complies with the minimum lot size and frontage requirements of the zoning. ANR endorsements can be applied for if every lot within the divided tract, at the time it is divided, has existing roadway frontage as required by the zoning bylaw. Not only must new lots meet the minimum frontage requirements, they must front on one of the three types of public ways, and must receive the Planning Board's determination that the vital access to such lots is practical access, that the way is adequate,

and that the access from the way to the buildable portion of the lot is adequate. If these conditions are met, ANR endorsement is typically given.

Table 1-3 lists by year and road the number of permits for new dwellings that were granted between 1996 and 2001. Based on this building permit information there were 33 building permits granted for new home construction in six years and two of these were for two-family homes. The roads with the greatest number of permits were Wendell Road (9), Montague Road (4), West Pelham Road (3), and Locks Pond Road (3). All but two of these permits were for ANR lots. The 1999-2004 Open Space and Recreation Plan also recognized this as the current development pattern and stressed the importance of determining which roadside natural, cultural, and recreational resources were most important to protect before ANR development compromised them.

To illustrate some of the long-term effects of development based on Shutesbury's current zoning, results of a build-out study are included here. This build-out study is part of a statewide effort funded by the Executive Office of Environmental Affairs. The methodology and results of the build-out study and associated GIS mapping are explained below.

The purpose of the build-out analysis is to determine potentially developable land areas for residential development. The process starts with identifying development that already exists based on 1999 MacConnell Land Use data. Already developed areas are subtracted from the town's total acreage and the remaining area is classified as undeveloped. Undeveloped areas are then screened for environmental constraints such as steep slopes in excess of twenty-five percent (25%), wetland areas, Rivers Protection Act buffer areas, and Zone I Recharge areas to public water supplies. In addition, protected open space is removed from consideration, but only those areas that are protected in perpetuity, such as land owned by the Department of Conservation and Recreation (Division of Water Supply Protection). Interestingly, some areas which you might expect to be screened, such as lands owned by the Town of Amherst within the Atkins Reservoir Watershed lands, may not be if a conservation restriction or some other legal mechanism is not placed on the deed to protect the land from development. Slopes between 15 and 25 percent are considered a partial constraint to certain types of land use that typically do not occur on relatively steep slopes. It is assumed that large lot residential uses could be located on the 15-25 percent slopes given a greater flexibility to grade and site structures. The areas that remain after the screening process are considered potentially developable.

The zoning district is applied to the potentially developable areas and a "build factor" is calculated. The build factor is calculated based upon the requirements of each zoning district in terms of minimum lot size, frontage, setbacks, parking required and maximum lot coverage permitted. Once calculated, the build factor is used to convert potentially developable acreage into residential house lots. Once house lots are calculated this can be translated into estimated population growth, miles of new roads, and additional water consumption and solid waste generation.

The results of the build-out analysis can be very startling. Table 1-4 describes the results of the build-out in numerical terms. According to the analysis, potentially developable land

covers approximately 8,700 acres or 50.2 percent of town, with a total approximate build-out population of 11,800. While it might take many decades to reach “build-out,” it is quite clear that Shutesbury’s current zoning will not protect the community’s rural character or natural resource base. Although it is not possible to determine exactly when build-out might occur, this may not even be necessary. Before the last acre was developed, Shutesbury’s residents, potentially nearing 12,000, may experience water shortages with a projected additional water demand of nearly 750,000 gallons per day. In addition, with 1,904 new school children at build-out, town Officials would have to build several new elementary schools. New subdivisions could result in the need for 84 miles of roads that may have to be maintained. Fire and police services would have to expand to protect the increased population.

Table 1-4: Summary Build-out Statistics of New Development and Associated Impacts

Potentially Developable Land (acres)	8,693
Total Residential Lots	3,561
Total Residential Units	3,567
Commercial/Industrial Buildable Floor Area (sq. ft.)	0
Residential Water Use (gallons per day) [2]	746,475
Commercial/Industrial Water Use (gallons per day) [2]	0
Non-Recycled Solid Waste (tons/year) [3]	3,630
Total Population at Build-out	11,763
New Residents [4]	9,953
New Students [5]	1,904
New Residential Subdivision Roads (miles)	84

Notes:

1. No development on wetlands
 No development on slopes in excess of 25%
 No development in Zone I Water Supply Protection Areas
 No development in protected open space
 No development within 150-foot buffer of transmission lines
2. Estimate from the Department of Housing & Community Development's Growth Impact Handbook
3. Statewide Average
4. 1990 Census; Population/Housing Units
5. MISER; 1997 School Children/Population

There would be highly significant ecological, economic, and quality of life impacts on the community caused by this level of population growth and development. Ecological impacts could include a reduction in the quantity and quality of wildlife habitat, a reduction in the quality of first and second order streams, lower air quality, and lower biodiversity. The economic impacts of this level of population growth and development would be felt well before maximum build-out is reached in the manner of higher property taxes. The fiscal impacts of Shutesbury’s current pattern of development of single-family homes on large lots of two acres or more are discussed in greater detail in the Land Use and Zoning Chapter of the Master Plan.

Natural Resources

Shutesbury's natural resources play an important role both locally and in the region. Like Wendell and New Salem to the north and east, and Pelham to the south, Shutesbury is located at the edge of the Quabbin Reservoir Watershed, which contains the largest drinking water supply in the Commonwealth, serving 2.5 million people in forty-three towns and cities. The Quabbin Reservoir and its surrounding watershed lands are also important because they are a significant forested habitat area that is protected from development and part of a greenway that stretches from Canada to Connecticut and Rhode Island. In the western half of Shutesbury, several brooks drain lands located within the easternmost reaches of the Connecticut River Watershed. How Shutesbury manages the natural resources within its political boundaries can impact the water quality and wildlife habitat value of both the Quabbin Reservoir and Connecticut River Watersheds. For example, excessive and unplanned growth within Shutesbury could negatively impact water and wildlife habitat values in both watersheds through the spread of pollution and non-native invasive species.

In this section, Natural Resources, information is presented within a watershed context. A watershed context can provide a basis for discovering and understanding the inter-relationships of various ecosystem components and for determining the most appropriate manner by which to conserve them. Although much of what residents can do to protect what they care about in town can occur within existing town boards and committees, or at Town Meeting, some of the means for protecting these resources may involve looking beyond Shutesbury's political boundaries. Streams flow across town boundaries and are shared community resources. Groundwater and wildlife move below and above ground and are affected by how people use the land no matter which town they are from. The sub-sections of the Natural Resources section include Geology, Topography, and Soils; Water Resources; Vegetation; and Wildlife and Fisheries.

Geology, Topography, and Soils

The land's general morphology today and the manner in which its main land form features affect soils, vegetation, and the community's use of the land. The region's geological history over the past 700 million years shaped Shutesbury's land formations.

The bedrock formations in the Town of Shutesbury are part of the Pelham Dome. The rock units are part of the Bronson Hill Anticlinorium, with the Connecticut River Valley Border Fault to the west and the Amherst Inliers to the southwest. The bedrock is predominantly Dry Hill Gneiss (Proterozoic Z) around Lake Wyola and Four Mile Gneiss (Ordovician, Cambrian, Proterozoic Z) to the east along the Quabbin Reservoir.

Shutesbury's topography could be described as a north-south running ridgeline or hill that slopes gently both north to Lake Wyola and south to Pelham. The manner in which the land slopes west from this north-south running hill is significantly different from the eastern slope to the Quabbin Reservoir (*see Topography Map*). The western half of Shutesbury, along the

boundary between the Connecticut and Chicopee River Watersheds, comprises four distinct upland areas draining into streams, which ultimately reach the Connecticut River. These four sub-watersheds are:

- 1) Lake Wyola/Sawmill River - Ames Pond (13 acres) and Lake Wyola (129 acres) in the north empty into the Sawmill River;
- 2) Dudleyville marsh/Sawmill River - Further south of Morse Hill, the Dudleyville marsh drains the eastern slopes of Brushy Mountain into another tributary of the Sawmill River;
- 3) Roaring Brook - In the central part of town an extensive wetland system, north of Leverett Road, flows into Roaring Brook; and,
- 4) Adams Brook - In the southwestern corner of town, upland slopes drain into many tributaries of Dean Brook, which empties into Adams Brook; Nurse Brook, an Outstanding Resource Water, empties into Atkins Reservoir, which also feeds Adams Brook

The fifth sub-watershed, the Quabbin Reservoir, is the largest sub-watershed, located in the eastern half of Shutesbury, within the larger in the Chicopee River Watershed. Steep slopes and the drainages of five fast-running brooks that flow south and southeast into the West Branch of the Swift River and the Quabbin Reservoir characterize this sub-watershed. The elevation drops 500 feet to the Quabbin Reservoir in this area, which contains the West Branch of the Swift River, Cobb Brook, Atherton Brook, Camel Brook, and Rocky Run. The eastern-most parcel of the 729-acre Shutesbury State Forest is also located in this area. The northeastern quadrant of Shutesbury is dominated by two north-south running ridgelines between Macedonia and New Boston Roads (*see Water Resources and Wildlife Habitat Map*).

Elevations in Shutesbury vary from 350 feet above sea level in the southwest corner of town near Atkins Reservoir to over 1,000 feet in the adjacent January Hills. The town center, at 1,225 feet, is situated at the top of the long, broad, north-south ridge. The highest point in town is 1,305 feet above sea level, north of Shutesbury Center along Wendell Road.

The Town of Shutesbury has approximately 670 acres (4 percent) of its soils classified as Prime farmland soils. Prime farmland soils locations were based on Franklin County soil maps developed by the Soil Conservation Service (now the Natural Resource Conservation Service) in 1967. Prime farmland soils classification is determined by such factors as precipitation, temperature, growing season, acidity, alkalinity, and stoniness. These soils, generally Merrimac, Sudbury, and Scituate types, are mostly scattered on small parcels, except for a large block east of New Boston Road and the West Branch of the Swift River. An additional 3,474 acres (20 percent) is considered farmland soil of state and local importance. This classification is determined by the same factors as the Prime soils, but fail to meet one or more of the requirements (often slope or stoniness). Large blocks of these soil types (Essex, Gloucester, Scituate, and Hinkley), described as shallow and deep well-drained soil in sandy glacial till, are distributed throughout town. Almost all of the farmland soils are presently forested. Many are sandy, stony, and/or sloping, and are better suited for orchards, vineyards, hay, or pasture than high yield cropland.

All but 143 acres (0.8 percent) are classified by the National Resource Conservation Service (NRCS) as soils having severe limitations for building. However, revisions to Title 5 have made it possible to construct septic systems using new technologies and construction methods. As a result, septic system regulations can no longer be considered to limit residential development.

Prime Forestland Soils

While agricultural land is in short supply in Shutesbury, the town has approximately 15,592 acres of forest, approximately 90 percent of the total land area. One method for describing the large forest acreage in Shutesbury is based on the productive capacity of the forest, which can be estimated by using the Massachusetts Prime Forest Classification System. A second method for describing the relative value of forestland compares the sizes of interior forest habitat area of large forest blocks. This second method is described on page 32.

Town officials might consider Prime forestland soils as a criterion for assessing the relative value of land protection opportunities. In addition, if the town were to establish a Municipal Forest for the purpose of growing timber as a source of revenue, soils would likely be one of the selection criteria. Finally, because forests are so important to residents, the soils that support tree growth best might be considered to be important enough to conserve through zoning (reduce density of development) and non-zoning means (encouragement of private land protection and forest management).

The U.S. Department of Agriculture (USDA) has a policy to locate Prime forestland soils and protect them from conversion to non-agricultural uses. USDA funded a project by the Department of Forestry and Wildlife Management (now Department of Natural Resources Conservation) of the University of Massachusetts to define, classify, and map the Prime forestlands in the State.

Table 1-5: Town of Shutesbury Acreage Assessment by Prime Forestland Soils Class

Class	Prime I Soils	Prime II Soils	Prime III Soils	Prime I, II, and III Soils
Acres of Forest in each Prime Soils Class	690 acres	3,412 acres	8,250 acres	12,352 acres
Percent of Total Shutesbury Land Area in Each Prime Soils Class	4.0 %	19.9 %	47.9 %	71.8 %
Percent of Total Shutesbury Forest Area in Each Prime Soils Class	4.3 %	21.2 %	51.4 %	76.9 %

Source: Research Bulletin Number 705/October 1985, Prime Forest Land Classification for Forest Productivity in Massachusetts, Massachusetts Agricultural Experiment Station, University of Mass. Amherst, 1985.

The Prime forestlands system has nine categories of soils based on productivity and wetness. Prime I, II and III, Prime III wet, Statewide Importance and Statewide Importance wet, Local Importance and Local Importance wet, and Unique. Prime forestland soils support a production of white pine wood fiber at a rate greater than eighty-five cubic feet per acre per year, and northern red oak wood fiber at a rate greater than forty cubic feet per acre per year.

As a point of comparison, the U.S. Forest Service defines forestland as vegetated cover with a growth of wood fiber at a minimum rate of twenty cubic feet per acre per year. The forestland with Prime I, II, and III soils would be the most important to conserve for commercial forest management. Soils of statewide and local importance still have the potential for producing wood products but the financial return may not be as high.

Many of the soils in Shutesbury belong to soil associations that are found in depressions or sloping locations and are comprised of sand or sandy loams. Many of these soils are classified as Prime I, II, and III forestland soils. By comparing these categories to the soil survey field maps for the Town of Shutesbury, one can identify the areas in town that contain Prime forestland soils. In general Prime I and II forestland soils are found mostly in the Connecticut River Watershed to the west of Wendell Road, while Prime III soils are in the Chicopee River Watershed to the east. Since the amount of land containing Prime I, II, and III forestland soils is equal to 12,352 acres, or 72 percent of the total land area in town and 77 percent of all forest (*see Table I-5*), a more focused inventory of Prime I and II soils is included below.

Prime I forestlands soils are comprised mainly of the Ridgebury series, which is characterized as seasonally wet, poorly drained fine sandy loam found in depressions and gently sloping upland areas. This soil is found in three main locations in Shutesbury:

1. The largest grouping of these Prime I forestland soils is located in upland areas surrounding the wetlands that drain into Roaring Brook. This area is found north of Leverett Road, west of Wendell Road, and east of Montague Road;
2. The second smaller area occurs just south of Morse Hill and east of the Dudleyville marsh, which drains into a tributary of the Sawmill River; and,
3. The third area is located south of Leverett Road and comprises the land draining into the tributaries of Dean Brook, which enters Atkins Reservoir, and five other smaller areas of Prime I soils located adjacent to West Pelham and Pelham Hill Roads.

Prime II forestland soils in Shutesbury are comprised mainly of the Gloucester series, which is characterized as well drained slightly droughty fine sandy loam generally found in nearly level to very steep uplands. The Sudbury and Merrimac series are also Prime II forestland soils but occur in Shutesbury to a lesser extent. The Sudbury series is characterized by moderately well drained fine sandy loam formed in deep sandy and gravelly deposits, which can be found in level to gently sloping glacial outwash and stream terraces. The Merrimac series is characterized by well-drained, slightly droughty, fine sandy loams. The Merrimac series can also include sandy loams on nearly level to steep kames, eskers and glacial outwash terraces. The largest areas of Prime II forestland soils are located:

1. Between the town line with Leverett and Montague Road;
2. In an area that straddles the intersection of Locks Pond and Wendell Roads;
3. On the slopes of January Hills;
4. East of Pratt Corner Road, and;
5. In the southwestern corner of town along the northern slopes of Poverty Mountain.

Water Resources

The conservation of Shutesbury's lakes and streams was considered to be *very important* by 84 percent of the people who responded to the 2001 Master Plan Survey. The protection of clean drinking water was also considered to be *very important*. It is important that streams, wetlands, and lakes be free from pollution because all residents rely on private wells that draw from groundwater. Groundwater recharges wetlands and streams and vice versa. If surface waters can be kept free of pollutants than private wells will be less likely to become contaminated.

Watersheds and Surface Waters

The Town of Shutesbury is rich in water resources that include a variety of brooks, streams, ponds, wetlands, and aquifers (*see the Water Resources and Wildlife Habitat Map*). As described above, land within the Town of Shutesbury drains into two main watersheds: the Connecticut River and the Chicopee River Watersheds. Within the Connecticut River Watershed, the four sub-watersheds are the Adams Brook sub-watershed, the two Sawmill River sub-watersheds, and the Roaring Brook sub-watershed. The Quabbin Reservoir sub-watershed is located within the Chicopee River Basin.

Connecticut River Watershed

The western half of Shutesbury lies in the Connecticut River Watershed, the largest river ecosystem in New England. The Connecticut River Watershed contains other sub-watersheds that are often viewed as major watersheds including the Chicopee, Millers, and Deerfield River Watersheds. It encompasses approximately 11,000 square miles and travels from its headwaters at Fourth Connecticut Lake at the Canadian border through Vermont, New Hampshire, Massachusetts, and Connecticut. The river enters Massachusetts through the Town of Northfield and drains all or part of forty-five (45) municipalities before entering the State of Connecticut where it eventually empties into Long Island Sound at Old Saybrook. The entire Connecticut River Watershed is 80 percent forested, 12 percent agricultural, 3 percent developed, and 5 percent wetlands and water.

Adams Brook Sub-watershed

The Adams Brook Sub-watershed is located within the portion of Shutesbury that is south of Leverett Road and west of Pelham Hill Road. It covers approximately 3,721 acres or 21 percent of the town. The three main brooks in this watershed are Dean Brook, Adams Brook, and Nurse Brook. There are also two main surface waters: Atkins Reservoir and Bakers Reservoir.

Dean Brook, Adams Brook and Nurse Brook

Dean Brook, Adams Brook and Nurse Brook are located in the southwestern part of Shutesbury. Dean Brook and Nurse Brook flow for a brief time along Sand Hill Road and Pratt Corner Road. Nurse Brook flows into Atkins Reservoir and Dean Brook empties into Adams Brook southeast of Atkins Reservoir, which flows south across the town's shared boundary with Pelham, along the base of the western slopes of Poverty Mountain. The Amherst Water Department sometimes diverts the water from Dean Brook into the Atkins Reservoir. Many forested and non-forested wetlands can be found at the headwaters of each brook and the NHESP considers an upper stretch of Dean Brook to be an Estimated Habitat of Rare Wildlife. A low to medium yield aquifer is also associated with this brook. According to the Natural Resources Program (1974), Dean Brook has one of the most scenic cascades and gorge landscapes in the area, on land owned by the Town of Amherst.

Atkins Reservoir

The Atkins Reservoir, developed in the 1930s, serves the Town of Amherst. It lies in the southwestern corner of Shutesbury along Market Hill Road. The reservoir has a watershed of approximately six (5.7) square miles, which is primarily forested with sparse large-lot residential development. The Reservoir's sub-watershed and that of Nurse Brook, are both classified as Outstanding Resource Waters under the Massachusetts Surface Water Quality Standards of 1995. These waters constitute a significant resource as determined by their outstanding socioeconomic, recreational, ecological and/or aesthetic values. The reservoir has a water surface of fifty-one (51) acres and a storage capacity of 200 million gallons. It has an estimated safe yield of 1.2 million gallons. It is off limits to any recreational use, but provides a scenic view from January Hills Road. A large area surrounding the reservoir is considered by the NHESP of the Massachusetts Division of Fisheries and Wildlife (DFW) to contain Estimated Habitats of Rare Wildlife.

Baker Reservoir

Baker Reservoir is a man-made pond located on the south side of Baker Road about two (2) acres in size, with a fifteen (15) acre wetland containing some unusual wetland plants along its south shore. The land surrounding the reservoir and wetland used to be in the Chapter 61B program, but was removed from the program during the past five years. Just to the west across West Pelham Road, the Town of Amherst owns a large contiguous block of forestland, which contains the tributary that drains the reservoir.

Sawmill River Sub-watersheds

Portions of two Sawmill River sub-watersheds are located in the northwestern portion of town, and cover approximately 2,655 acres or 15 percent of Shutesbury. The Lake Wyola/Sawmill River Sub-watershed drains land as far north as Montague Road in the

neighboring town of Wendell. The watershed in Wendell includes Fiske Pond, Fiske Brook, and Plympton Brook, all of which drain into Lake Wyola. To the south and east of Lake Wyola, Ames Pond and South Brook drain the slopes of Ames Hill and Mount Mineral to the east and southeast, the eastern slopes of Morse Hill to the west, and at the southern extremes of its basin, the northern slopes of the town's highest hill at 1,305 ft.

The Dudleyville Marsh/Sawmill River sub-watershed drains approximately thirty-two (32) square miles of land located in the towns of Shutesbury, Wendell, Leverett and Montague. From its origin at the Lake Wyola dam in Shutesbury, the Sawmill River flows westerly for approximately fourteen (14) miles to its confluence with the Connecticut River in the Town of Montague.

Eighty-five (85) percent of the watershed area is primarily forested and is located upstream from State Route 63 in Montague. The topography and stream gradients of this portion are fairly steep. The valleys are narrow with limited floodplains. In general, housing density in this section is low with most homes located adjacent to roads. The exception to this is the dense housing surrounding Lake Wyola and the headwaters of the Sawmill River, with most lots of less than a ¼ acre in size. Downstream from State Route 63 the watershed characteristics change. The land use is a mixture of cropland, pasture, forest and other open land. The topography flattens and the valley (floodplain) widens. Development is generally light with the exception of the Village of Montague Center.

According to the Sawmill River Watershed Assessment conducted by the Natural Resource Conservation Service (NRCS) (March, 2002), the most significant environmental issue in the watershed is the erosion of the streambanks with subsequent sedimentation, resulting in habitat destruction, flooding and bridge/roadway maintenance problems. These environmental concerns have been caused by human manipulation of the river since colonial times. The forms of manipulation include damming of the river for waterpower; dredging of the river in an attempt to provide more capacity for floodwater; the construction of bridges across the river with bridge abutments located in the active floodplain, thereby causing restriction or deflection of the natural streamflow; the placement of riprap along both North Leverett Road and Sunderland Road causing an increase in stream velocity and deflection of flows to more erodible sand and gravel deposits; and to a lesser extent the farming practice of allowing cows access to the river causing erosion due to hoof traffic.

Also of concern is the degradation of fisheries habitat along the river. Sedimentation can negatively impact the spawning habitat in the streambed. The erosion along the streambanks removes overhanging vegetative cover and increases water temperature, which also affects the habitat. In addition, dredging of the sediment, has resulted in widening of the stream channel, reducing the depth of the streambed, thereby increasing water temperature.

The riparian corridor is also being transformed through direct and indirect human actions. The typical land cover along riparian corridor is composed of mature trees. However, there are stream segments along the Sawmill River where this forested buffer has been replaced by impervious surfaces, riprap, or mowed grass. Invasive species are also present and in some

places have successfully taken over the understory. As a result, overall plant diversity declines, negatively impacting wildlife habitat.

In summary, protecting the quality of the riparian corridor and the land uses in the upper reaches of the Sawmill River in Shutesbury will likely help to reduce some of the problems occurring further downstream. If development were to gain a greater foothold surrounding the tributaries to Sawmill River, or if invasive species were to become even more prevalent, it is likely that these changing conditions within the river ecosystem would continue to negatively impact plant and animal species.

Lake Wyola

Lake Wyola, located in the northwestern corner of Shutesbury, is approximately 129 acres in size. It is intensively used for fishing, swimming, and boating. More than three quarters of the shoreline is developed with year-round homes and summer cottages. At the north end of the lake is the Carroll Holmes Recreation Area, a major DCR facility that attracts hundreds of bathers daily at the peak of the swimming season. At the south end of the lake there is a public boat launch ramp.

At the southern end of the lake, both forested and non-forested wetlands are fed by the Ames Brook and South Brook sub-basins, which also contain an extensive low- to medium-yield aquifer. This aquifer extends south to a small wetland system east of Wendell Road and east to Ames Pond and includes a tributary of the West Branch of the Swift River.

Approximately 80 percent of the water enters Lake Wyola via Fiske Brook, on the east side of the lake; the Fiske Brook watershed is located in Wendell.

The present shoreline of Lake Wyola was established by the construction, around 1900, of a dam that approximately doubled the surface of the original great pond, known as Locks Pond. The surface elevation of the lake is controlled by this dam; its outflow feeds the Sawmill River, which originates at this point. In addition to water flowing over the dam, a manually operated gate built into the dam permits the further release of water to the river. In June 1998, the DEM (now DCR) Office of Dam Safety inspected the dam and ordered some repairs and a safety assessment of the dam; the repairs were accomplished during the lake drawdown in September 1998, but the safety assessment has yet to be undertaken for lack of funds. In light of recent legislation (2002) that makes owners of dams responsible for their inspection and maintenance and liable for damage caused by their failure, such an assessment has become both imperative and urgent

Lake Wyola is a valuable resource for recreational fishing. A good warm water fishery, it was found by a 1978 Mass Wildlife survey to provide habitat for nine species of fish. In 1999, the NHESP of the Massachusetts Division of Fisheries and Wildlife designated Lake Wyola as an area that contains rare wetlands wildlife and as a priority habitat area that includes unique habitat features. The impact of this designation is significant: any plan for construction in the lake area that involves the alteration of the lake itself or the filling of wetlands must be submitted to Natural Heritage as well as to the Shutesbury Conservation

Commission, which is the local administrator of Natural Heritage, to be reviewed for possible adverse effects on the rare species.

Presently, Lake Wyola's water quality is good, according to local water quality testing that has been conducted over the past ten years. Testing results indicated that Lake Wyola could be classified as mesotrophic. Measurements show low levels of nitrogen, phosphorus, and algae. Algae growth is monitored via water transparency and chlorophyll concentration.

Invasive vegetation has not yet been carried to Lake Wyola. Aquatic vegetation is monitored regularly via samples taken by scuba divers and by underwater video mapping. The Lake Wyola Advisory Committee works to prevent the introduction of invasive species by educating boat owners and by providing cleaning equipment and instruction at the boat launch ramp.

A Management Plan for Lake Wyola was prepared in 1997 by New England Environmental, Inc., of Amherst, under a grant from the Massachusetts Department of Environmental Management. This plan recommends lake drawdown every seven years for vegetation control and repair of shoreline structures. The plan also includes recommendations for the control of erosion and runoff leading to sediment deposition, with emphasis on the proper maintenance of both paved and unpaved roads.

An extensive study of the total phosphorous distribution in Lake Wyola and its watershed, funded by the Massachusetts Watershed Initiative (2000-2001) found total phosphorous levels to be low. In November, 2002, Lake Wyola was removed from the DEP's 303(d) list of impaired waters. In 2003, the Department of Environmental Management, together with the Town of Shutesbury, the Lake Wyola Advisory Committee, and the Lake Wyola State Park/Ruggles Pond Advisory Board, applied for and was awarded a "319 Non-point Source Pollution Grant" to protect Lake Wyola and its watershed, with emphasis on erosion control and drainage improvement, public education, and a septic management program. Tasks will include a detailed survey of non-point source pollution in the watershed.

Ames Pond

Ames Pond is approximately thirteen (13) acres in size, and includes a two (2) acre natural bog. Ames Pond is a man-made water body with a stone dam. Abundant wildlife use the pond as a source of water, food, and shelter. A large acidic bog is located northeast of the pond and is home to plants typical of sphagnum bogs. The landowner of the pond has maintained a boardwalk across the pond's edges and has allowed the public to use the trails around the bog. Currently the pond is surrounded by land protected with a conservation restriction (*see Open Space section and Open Space Map*). In 2003, the Department of Conservation and Recreation acquired development rights to some 140 acres of this property; there is limited public access.

Roaring Brook Sub-watershed

The Roaring Brook sub-watershed drains lands in the west central portion of Shutesbury and covers approximately 2,914 acres or 17 percent of the town. The Roaring Brook flows from Shutesbury into the Town of Leverett along Leverett Road. In Shutesbury, Roaring Brook is located north of Leverett Road with its main tributaries located in the western central area of town between Montague Road and Wendell Road. This watershed contains five vernal pools, forested and non-forested vegetative wetlands, and estimated habitats of rare wildlife (*see Water Resources and Wildlife Habitat Map*). Roaring Brook has historically been used by small mills for its waterpower as evidenced by the remains of dams in Leverett. The Massachusetts Department of Fisheries and Wildlife (DFW) stocks the brook annually with trout. An extensive low to medium yield aquifer straddles the brook and may be associated with the source of the Shutesbury Elementary School's public water supply well.

Chicopee River Watershed

The eastern half (45%) of the Town of Shutesbury is located in the Quabbin Reservoir sub-watershed within the larger Chicopee River Watershed. Of the 7,862 acres within the Quabbin Reservoir sub-watershed, 5,098 or 65 percent is owned by the Department of Conservation and Recreation (Division of Water Supply Protection). The Chicopee River Watershed is comprised of three major river systems, the Swift River, Ware River and Quabog River. All merge to form the mainstem Chicopee River in the village of Three Rivers. The Chicopee River Watershed represents the largest of the twenty-seven (27) major drainage basins in the Commonwealth of Massachusetts and is also the largest tributary to the entire Connecticut River. The watershed includes all or part of thirty-nine (39) cities and towns. It has a drainage area of approximately 720 square miles and encompasses approximately 135 rivers, 842 miles of brooks and streams, and 170 lakes, ponds and reservoirs, which collectively cover more than forty-eight (48) square miles across the watershed.

The watershed priorities for the Chicopee River Watershed as outlined by the Massachusetts Executive Office of Environmental Affairs include: Stormwater impacts and implementation of Phase II regulations; Open space protection; Combined Sewer Overflow mitigation; Lake and Pond issues; Capacity-building, especially of NGO's and municipalities; Outreach and Education; and, Water supply protection (both existing and future supplies).

The Quabbin Reservoir Watershed has been designated by the Massachusetts Audubon Society (MAS) as an Important Bird Area (IBA). The IBA encompasses 120,000 acres and includes the Reservoir itself. According to MAS there are three state-listed species that breed at the Quabbin Reservoir Watershed IBA. They are the Common Loon, Bald Eagle and Pied-billed Grebe. Due to the large amount of contiguous forest, the watershed supports significant breeding populations of forest-associated songbirds, including thirty-five (35) high conservation priority species (Mass. Audubon Website; 2002).

The Quabbin Reservoir Watershed offers a number of recreational opportunities with 3,500 acres available for public use. The area offers hiking, picnicking and nature study. In the northern end of the reservoir itself, fishing, boating, and hunting are permitted.

In 1991, the Division of Watershed Management and the Massachusetts Water Resources Authority (MWRA) developed the Watershed Protection Plan for the Quabbin Reservoir/Ware River Watersheds as the first written plan for management of the watershed. A Plan Update was developed in 2000, which provides a framework for prioritizing and implementing the complement of watershed protection activities through the definition of water quality goals, watershed protection goals and defined geographic protection zones.

Table 1-6: Summary Table of Testing Results for the Quabbin Reservoir Watershed– Shutesbury, Massachusetts Segments

Location	Aquatic Life	Fish Consumption	Primary Contact (e.g. Swimming)	Secondary Contact (e.g. Boating)	Overall Ranking of Segment
Atherton Brook Headwaters at confluence of Town Farm and Osgood Brooks, Shutesbury to mouth at Quabbin Reservoir in Pelham (1.9 mi.)	Support <i>Although pH is low, it is considered to be naturally occurring. Dissolved oxygen and temperature measures indicated high water quality.</i>	Not Assessed	Support	Support	Class A <i>These waters are designated as a source of public water supply</i>
West Branch Swift River at Headwaters outlet of small unnamed impoundment east of Cooleyville Rd. in Wendell State Forest, Wendell to mouth at Quabbin Reservoir, Shutesbury/New Salem (6.3 mi.)	Support	Not Assessed	Support	Support	Class A <i>These waters are designated as a source of public water supply.</i>

Source: MA Department of Environmental Protection, “Chicopee River Basin, 1998 Water Quality Assessment Report” 1998.

The Watershed Protection Act (WPA) was passed in 1992. This act provides protection to the watersheds of the Quabbin Reservoir, Ware River, and Wachusett Reservoir (M.G.L. Chapter 36 of the Acts of 1992). The WPA and its regulations address land uses and activities in two critical areas. First, within 400 horizontal feet of the reservoirs and 200 horizontal feet of the tributaries and surface waters (Primary Protection Zone), any alteration is prohibited. Secondly, between 200 and 400 horizontal feet of tributaries and surface waters and on certain other lands (Secondary Protection Zone), specific activities are prohibited and all development proposals are evaluated. Through the WPA, the Department of Conservation and Recreation (Division of Water Supply Protection)(DCR/DWSP) regulates 11,011 acres in the Quabbin Reservoir Watershed. Additionally, the DCR/DWSP works with state agencies and local communities to ensure the full utilization of state and local environmental regulations.

The Swift River Sub-watershed totals 45.1 river miles along eight (8) rivers and includes Atherton Brook, Cobb Brook, Camel Brook, and the West Branch of the Swift River, which flow through the Town of Shutesbury, and are tributaries to the 187 square mile Quabbin Reservoir.

West Branch of the Swift River

The West Branch of the Swift River lies in the eastern half of the Town of Shutesbury in the Quabbin Reservoir Watershed. The West Branch of the Swift River is classified as a Class A water body, a source of public water supply (*see Table 1-6*). The headwaters for this River are located in the Town of Wendell to the north. Numerous forested wetlands can be found along its length. The West Branch is stocked with trout but also contains a native brook trout population, which is a sign of high quality water. The West Branch is a popular fly-fishing spot, and also contains landlocked salmon migrating up from the Quabbin Reservoir in the fall. In addition, a low to medium yield aquifer straddles the river from the edge of the reservoir, north to a point on the river due east of the intersection of Locks Pond and Wendell Roads (*see Water Resources and Wildlife Habitat Map*). The NHESP considers the southern most mile of the river to be both Estimated Habitats of Rare Wildlife and Estimated Priority Habitats of Rare Species.

Atherton Brook

Atherton Brook is located in the southeastern corner of the Town of Shutesbury and is also classified as a Class A water body. It crosses the border into the Town of Pelham where it converges with the Quabbin Reservoir. The brook's southern most one and a half miles is considered by the NHESP to be Estimated Habitats of Rare Wildlife. An old bog is located west of Pelham Hill Brook at the headwaters of Atherton Brook, which is also considered to contain Estimated Habitats of Rare Wildlife. Osgood and Town Farm Brooks are tributaries of Atherton Brook that drain forested wetlands located southwest of Shutesbury Center.

Rocky Run, Camel Brook, and Cobb Brook

Rocky Run, Camel Brook, and Cobb Brook are tributaries of the West Branch of the Swift River (and the Quabbin Reservoir) that drain the lands east of Wendell Road and Shutesbury Center. Significant portions of these brooks are located on land owned by the Department of Conservation and Recreation (Division of Water Supply Protection)(DCR/DWSP), which is considered to be protected from development and as such, is characterized as having a lower priority for water quality monitoring by the DCR/DWSP (Lyons, DCR/DWSP, personal communication; 2002).

Vernal Pools

The Commonwealth's Natural Heritage & Endangered Species Program (NHESP) describes vernal pools as unique wetlands that support diverse and valuable wildlife communities, including many state-listed rare species. Vernal pools vary in size and physical characteristics, but all are characterized by springtime ponding, a lack of reproducing fish populations, and the wildlife communities that are adapted to these conditions. They are all important to the long-term preservation of biodiversity.

According to the 1999-2004 Shutesbury Open Space and Recreation Plan, there are approximately twenty (20) known vernal pools in the Town of Shutesbury, not including those found in the Quabbin Reservoir Watershed. Twelve (12) have been certified by the Natural Heritage Program (NHESP; 1999). To educate the public and provide more information about potential vernal pool locations throughout the state, in 2001 the NHESP published the *Massachusetts Aerial Photo Survey of Potential Vernal Pools*. Based upon interpretation of aerial photos, thirty-four (34) potential vernal pools in Shutesbury have been identified by the NHESP. Certified vernal pools are different than potential vernal pools in that they have been field checked and documented by the NHESP, and are provided with regulatory protection through the Massachusetts Wetlands Protection Act Regulations. Potential vernal pools have not been certified, and require field verification to determine whether they qualify for protection under the Wetlands Regulations.

Wetlands

Many wetland types, including forested and non-forested wetlands, exist along Shutesbury's rivers, streams and ponds, as well as in upland areas. Wetland areas are often high in biological diversity and are nature's way of ensuring good water quality. Both wetlands and floodplains perform crucial environmental functions such as flood storage and control, and pollution filtration. Supporting approximately 43 percent of the nation's rare and endangered species, wetlands are home to an abundance of wildlife. They are also commonly recharge zones for groundwater sources. For all of these reasons, it is important that Shutesbury identify and protect its wetlands and floodplains.

The majority of wetlands in the Town of Shutesbury are forested, commonly evergreen or evergreen/deciduous mix. The most dominant evergreen of these wetlands is eastern hemlock, with some wetlands also containing white pine, or occasionally larch or black spruce. Deciduous forested wetlands are predominately red maple swamps, many resulting from previous beaver activity. Shrub wetlands occur especially around the edges of water bodies, and include deciduous shrubs such as red maple, winterberry, blueberry, and viburnums, but also myrica gale, and leatherleaf in the bogs.

Shutesbury's major wetland resources include: a two (2) acre natural bog adjacent to Ames Pond; a fifteen (15) acre wetland adjacent to Baker Reservoir containing some unusual wetland plants along its south shore; and the Dudleyville marsh. The Dudleyville marsh off the eastern and western sides of Montague Road used to be ponds that were drained several

years ago (per order of the Massachusetts Department of Dam Safety) and have become the only large expanses of marsh in the Town of Shutesbury, with the exception of the Quabbin Reservoir Watershed. The ponds are now nine (9) acres of shallow and deep marsh, with a natural spring and sphagnum bog on the western side. The owner has a permit to rebuild the dam and re-flood the area. There are numerous other wetlands in the Town of Shutesbury.

Wetland protection in Shutesbury takes many forms. The Conservation Commission helps to protect town wetlands through their inspection of notices of intent. The Department of Conservation and Recreation (Division of Water Supply Protection) and the Town of Amherst both purchased a significant percentage of their watershed lands. In addition, the acquisition of the South Brook Conservation Area was in part to protect watershed lands. There have also been recent efforts to adopt a watershed protection overlay district by the Planning Board.

The provisions of the Federal Clean Water Act, the Massachusetts Wetlands Protection Act (M.G.L. Chapter 131, Section 40, February 14, 1997), and the Massachusetts Rivers Protection Act, as amended in 1996, provide some protection to wetlands. The Clean Water Act prohibits virtually any ground-disturbing activities within 100 feet of all wetlands unless approved through special permit. However, historic enforcement of the law does not meet the stated policy of “no net loss” of wetlands acreage, nor are there adequate systems for tracking the losses annually, according to a report by the National Academy of Sciences. In 1997, the United States Fish and Wildlife Service estimated that the nation was losing 58,500 acres of wetlands to development or agriculture annually. According to the National Audubon Society, wetlands losses are closer to 100,000 acres a year.

The Massachusetts Wetlands Protection Act prohibits removal, dredging, or alterations of any river or stream bank, freshwater or coastal wetlands, beach, dunes, flat, marsh, meadow or swamp bordering on any resource area as defined in the Act without a permit from the Commission to perform the work. The jurisdiction of the Commission includes the 100-foot buffer zone located from the edge of these resource areas. Its intent is to ensure the protection of public and private drinking water and groundwater supplies, land containing shellfish, wildlife habitat, and fisheries, to control flooding, and to prevent storm damage and pollution.

The Rivers Protection Act, Chapter 258 of the Acts of 1996, creates a 200-foot riverfront corridor on each side of a perennial river or stream, measured from the mean annual high-water line of the river, to protect the natural integrity of rivers and to encourage and establish open space along river. The riverfront areas protect water quality, stabilize stream banks, reduce flood peaks and downstream flooding, support fish and wildlife habitat, and protect groundwater. Riverfront areas may contain wetlands and floodplains, but intermittent streams are not subject to the Rivers Protection Act. According to area estimates using 100- and 200-foot buffers of perennial rivers and brooks in Shutesbury, as found in the MassGIS hydrography coverage, there are approximately 890 acres of land within the first 100 feet of the riverfront area and 861 acres within the second 100 feet.

The law builds on the strength of the existing permitting procedures under the Wetlands Protection Act. The Shutesbury Conservation Commission or the State Department of

Environmental Protection (DEP) reviews projects located within the riverfront area. Work in the riverfront area is not prohibited, but applicants must demonstrate that their projects have no practicable alternatives and will have no significant adverse impacts. Existing structures such as single-family homes and accessory uses are exempt from the Rivers Protection Act.

Aquifers and Drinking Water Supplies

Aquifers are important water resources that exist underground. When it rains heavily, a large percentage of water infiltrates the soil, slowly migrating down to the saturated zone. The area between the saturated zone and the unsaturated zone is known as the water table of the aquifer. When more rain enters the aquifer than is taken out, the water table rises. The US Geological Survey (USGS) and the Office of Massachusetts Geographic Information Systems (MassGIS) have mapped subsurface conditions that support low to medium yield aquifers (*see the Water Resources and Wildlife Habitat Map*). According to the USGS and MassGIS there are low-to medium yield aquifers located in the vicinity of the following water bodies:

- Lake Wyola and Ames Pond;
- Dudleyville marsh;
- West Branch of the Swift River;
- Roaring Brook; and,
- Dean Brook.

Low to moderate yield aquifers could provide enough water for a small community supply. It is estimated by DEP that low to medium yield aquifers can produce 0-50 gallons per minute (gpm), while high yield aquifers tend to produce in the 50-200 gpm range. A well rated at 50 gpm, would produce 72,000 gallons per day. Based on an average per person consumption figure of 75 gallons, used by the Massachusetts Executive Office of Environmental Affairs (EOEA) Community Preservation Initiative, an aquifer of this yield could serve 960 people. Aquifers and potential community water supplies will be discussed further in the Master Plan Chapter, Community Facilities and Services.

It is imperative that the Town of Shutesbury takes watersheds into consideration when considering the quality and quantity of drinking water that may be available to it. The fact that an aquifer is physically located within the town does not automatically guarantee that its water resources are available for use as drinking water by town residents: the water may be part of a watershed that is already allocated to other users (such as the Town of Amherst) or other uses (such as stream flow). Under the Water Management Act (Chapter 592, Acts of 1985), the Water Resources Commission has jurisdiction over the allocation of water within a watershed. The Commission must consider impacts on stream flows in the watershed and other riparian users when ruling on any proposed water withdrawal.

Currently there are no public wells or water distribution systems in Shutesbury, except for the elementary school, Lake Wyola State Park, and one associated with the Fire Station that has been connected to several homes. All other households rely on private wells. Therefore

the protection of groundwater throughout town must be one the highest environmental priorities for the town and its residents.

Surface Water Protection Areas

The Commonwealth of Massachusetts Regulations for Surface Water Supply Protection (310 CMR 22.20B) outline land use restrictions as they relate to three surface water supply protection zones: A, B, and C. Each zone represents portions of the watershed of a surface water supply:

Zone A comprises:

(a) the land area between the surface water source and the upper boundary of the bank; (b) the land area within a 400 foot lateral distance from the upper boundary of the bank of a Class A surface water source, as defined in 314 CMR 4.05(3)(a); and, (c) the land area within a 200 foot lateral distance from the upper boundary of the bank of a tributary or associated surface water body.

Zone B comprises:

the land area within one-half mile of the upper boundary of the bank of a Class A surface water source, as defined in 314 CMR 4.05(3)(a), or the edge of the watershed, whichever is less. However, Zone B shall always include the land area within a 400-foot lateral distance from the upper boundary of the bank of the Class A surface water source.

Zone C comprises:

the land area not designated as Zone A or B within the watershed of a Class A surface water source as defined at 314 CMR 4.05(3)(a).

The Town of Shutesbury contains two Class A surface water sources: Atkins Reservoir and the Quabbin Reservoir (*see the Water Resources and Wildlife Habitat Map*). The degree to which land uses are restricted in each zone is based on the source's vulnerability to contamination. For example, the regulations dealing with Zone A are more restrictive than in Zone C. The following uses are prohibited within Zone A:

- Underground storage tanks;
- Above ground storage of liquid hazardous materials including liquid propane and petroleum products, and certain wastewater treatment or disposal facilities;
- Facilities that generate, treat, store or dispose of hazardous wastes;
- Sand and gravel excavation operations;
- Uncovered storage of manure, fertilizers, de-icing materials;
- Junk and salvage operations;
- Motor vehicle repair operations;
- Cemeteries; and,
- Land uses that render impervious of more than 15 percent, or more than 20 percent with artificial recharge, or 2500 sq. ft. of any lot, whichever is greater.

Certain regulations also apply to land uses within Zones B and C. These include the requirement that all on-site subsurface sewage disposal systems, within the Zones A, B, and C must comply with 310 CMR 15.00 (Title 5). In addition, public water supply systems are directed to inspect Zones A, B, and C to ensure compliance with the regulations and to protect the surface water supply.

Vegetation

According to the MassGIS 1999 land use datalayer, nearly 87 percent of Shutesbury is forest. This forest is dominated by red and black oak, red maple, white pine, eastern hemlock, and black birch. Beech, white and yellow birch, and sugar maple are also present. Mountain laurel can dominate the understory in many places.

Non-forested vegetation is relatively rare in Shutesbury. The 2002 GIS land use datalayer indicates that there are 280 acres of open land. Power lines and pasture account for much of this open land. In what is otherwise a densely forested town, these areas of open vegetation represent important visual diversity, relatively unique wildlife habitat, and an opportunity for views.

Forest Land

The 2002 Land Use Map identifies where different forests and agricultural lands are located in Shutesbury. The agricultural lands are predominantly pasture. Forest types include evergreen forests, where eastern hemlock and white pine are the likely dominant species in the overstory (the tallest trees making up the top layer of the forest); deciduous forests comprised of northern red oak, sugar maple, red maple, trembling aspen, paper birch, white ash, and black cherry; and mixed forests where both evergreen and deciduous species are present.

The location of these different vegetative covers relates to both historical land use patterns and local topography. By comparing the 2002 Land Use Map to the Topography Map (*see both maps at the end of this chapter*) it is possible to draw preliminary conclusions about what types of landforms suit different forest types best in Shutesbury: evergreens like lowland and riparian areas while deciduous forest dominate uplands and drier south-facing slopes.

Large areas of evergreen forests of eastern hemlock and white pine are located in several distinct places including plantations near reservoirs. From southwest to northeast these areas include:

- Surrounding and mostly north and east of Atkins Reservoir;
- Straddling Dean and Baker Brooks and the wetlands that are at the headwaters of this drainage area (just north of Baker Reservoir);
- Straddling Roaring Brook and the steep terrain it drains, west of Montague Road;
- Northeast of the Dudleyville marsh to the southern slopes of Morse Hill, to the Town Conservation Area and then to a relatively level area southeast of Ames Pond; and,

- Where the West Branch of the Swift River and the brook, which drains Sibley Swamp in Wendell, drain into relatively gentle sloping land a mile from the shores of the Quabbin Reservoir.

In contrast, *large areas of deciduous forests* appear to be mostly located in upland areas:

- Along the main north-south broad ridgeline from Pelham Hill Road east to the southeastern slopes of the Quabbin Watershed in Shutesbury and north along Wendell Road to the southern boundary of the Lake Wyola Watershed, and;
- On a southwestern facing slope on land located along the Leverett town line just north of Leverett Road.

Rare and Endangered Plant Species

Rare and endangered species information for plants and animals is maintained by the Massachusetts Division of Fisheries and Wildlife's Massachusetts Natural Heritage & Endangered Species Program (NHESP). Habitats for both rare plant and animal populations are documented and mapped by NHESP (as Priority Habitat Maps) under the state Endangered Species Act Regulations. Estimated Habitat Maps delineate the approximate locations of habitats of state-protected wildlife (including vernal pools) under the Wetlands Protection Act Regulations and the Forest Cutting Practices Act Regulations. It is important to remember that the NHESP data base and geographical mapping is limited by what has been identified and documented by scientists – there are extensive areas of the state, including Shutesbury where detailed and comprehensive surveys could result in substantial increases of numbers and locations of rare species and important natural communities.

According to the NHESP, currently there are three state-listed rare plant species or special communities in Shutesbury that have been documented. Table 1-7 lists those plants found to be endangered or of special concern (*see Water Resources and Wildlife Habitat Map*).

Table 1-7: Rare Plant Species Rated as Endangered and of Special Concern found in the Town of Shutesbury

Scientific Name	Common Name	Taxonomic Group	Rank
<i>Acer nigrum</i>	Black Maple	Vascular Plant	Special Concern
<i>Eleocharis obtusa</i> var <i>ovata</i>	Ovate Spike Sedge	Vascular Plant	Endangered
<i>Goodyera repens</i>	Dwarf Rattlesnake Plantain	Vascular Plant	Endangered

Source: Natural Heritage and Endangered Species Program Website, 2002

According to the NHESP, the Black Maple, last observed in 1929, prefers rich, moist soil associated with floodplain or riparian deciduous forests. The Black Maple does not do well in acidic soils but grows best in shade or filtered sunlight. The Ovate-Spike-sedge, a grass-like plant found in marshes, and the Dwarf Rattlesnake Plantain, a small orchid of coniferous forests have also not been documented in Shutesbury since the 1920s.

Wildlife and Fisheries

The heavily forested Shutesbury landscape provides abundant wildlife habitat for a diversity of species. The following inventory was obtained from the 1999-2004 Town of Shutesbury Open Space and Recreation Plan. Sources cited in the Open Space and Recreation Plan are the Massachusetts Division of Fisheries and Wildlife records of wildlife sightings, Natural Heritage and Endangered Species Program Atlas and database, and a survey of Shutesbury residents.

The following wildlife species (or clear evidence of them) have been sighted in Shutesbury and may be using habitat areas in town for food, shelter, water, and mating needs, and as cover while traveling between habitat areas. Species are listed according to the size of their general habitat needs based on R.M. DeGraaf and D.A. Richard's 1987 "Forest Wildlife of Massachusetts," published by the University of Massachusetts Cooperative Extension Service. This book utilizes cover type, size class, and special habitat relationships to estimate the species that would typically be found in different habitat areas by size of home range (1-10 acres, 11-50 acres, and greater than 50 acres). Species considered to be rare, threatened, or endangered by the NHESP are indicated with an asterisk (*).

According to General Technical Report NE-144, by R. M. DeGraaf et al., "New England Wildlife: Management of Forested Habitats," the area used by wildlife species can fluctuate based on factors such as availability of habitat mixtures (i.e. field, forest, wetland), the type of habitat most used by the species, the species' relative abundance in a particular area, and the season of the year. The procedures used to determine year-round, home ranges of wildlife are complex and are based on estimating individuals' responses to a mix of habitat conditions in different seasons across a given landscape. The information presented below may be best used as a guide in determining how parcels of land and larger groups of parcels might provide year-round habitat for various species. Approximately 64 percent of the 338 forest wildlife species that could potentially be found in New England have average home ranges or territories that are less than ten (10) acres while another 15 percent have home ranges greater than fifty (50) acres. Most raptors, large-bodied woodpeckers, and most medium and large-sized mammals need home ranges in this latter category. However, even areas of undeveloped land less than ten acres in size can provide portions of the year-round habitat needs of both animals with large territories and of migratory species.

Mammals

Forest habitats, home ranges of 1-10 acres in size:

Water shrew*, eastern chipmunk, flying squirrels, woodchuck, grey squirrel, red squirrel, raccoon, and porcupine.

Forest habitats, home ranges greater than 50 acres:

Eastern coyote, skunk, red fox, fisher, white tailed deer, moose, black bear, bobcat, mink.

Birds

Forest habitats, home ranges of 1-10 acres:

Mourning dove, white-throated sparrow, song sparrow, chipping sparrow, slate-colored junco, rufous-sided towhee, purple finch, house finch, northern cardinal, fox sparrow, rose-

breasted grosbeak, evening grosbeak, ruby-throated hummingbird, yellow-bellied sapsucker, eastern wood peewee, eastern phoebe, blue jay, tufted titmouse, Carolina wren, American robin, wood thrush, veery, gray catbird, northern mockingbird, Eurasian starling, cedar waxwing, warbling vireo, solitary vireo, red-eyed vireo, ovenbird, blue-grey gnatcatcher, ruby-crowned kinglet, blackpoll warbler, bay-breasted warbler, Nashville warbler, Connecticut warbler, pine warbler, Kentucky warbler, myrtle warbler [Audubon's warbler], black-throated green warbler, black-throated blue warbler, yellow warbler, common yellowthroat, black-and-white warbler, magnolia warbler, chestnut-sided warbler, common grackle, northern oriole, whippoorwill, bluebird, nighthawks, and cooper's hawk.

Forest habitats, home ranges of 11-50 acres:

Black-capped chickadee, white-breasted nuthatch, American crow, northern goshawk, brown creeper, hairy woodpecker, and northern flicker.

Forest habitats, home ranges of greater than 50 acres:

Barred owl, Common raven, pileated woodpecker, great-horned owl, and saw-whet owl.

Wetland and open types of any size:

Red-throated loon, common loon, great blue heron, double-crested cormorant, pied-billed grebe, red-necked grebe, eared grebe, Canada goose, wood duck, white-winged scoter, black scoter, mallard, lesser scaup, greater scaup, old squaw, ring-necked duck, bufflehead, snow goose, common goldeneye, black duck, hooded merganser, common merganser, osprey, merlin, sharp-shinned hawk, bald eagle, red-tailed hawk, peregrine falcon, cliff swallow, bank swallow, barn swallow, tree swallow, spotted sandpiper, American crow, black-backed gull, herring gull, little gull, red-winged blackbird, kingfisher

The following birds, not listed above, were sighted in Shutesbury as part of Biodiversity Days 2002:

American goldfinch, American woodcock, Baltimore oriole, Blackburnian warbler, blue-winged teal, brown-headed cowbird, common yellowthroat, great blue heron, hermit thrush, house wren, purple martin, scarlet tanager, turkey vulture, white-breasted nuthatch, wild turkey, winter wren.

Amphibians and reptiles

Forest habitats, home ranges of 1-10 acres:

Garter snake, water snake, ring neck snake, brown snake, milk snake, painted turtle, American toad, bull frog, gray treefrog, green frog, pickerel frog, spring peeper, wood frog, red-spotted newt, redback salamander, spotted salamander, dusky salamander, two-lined salamander, spring salamander*, marbled salamander*, four-toed salamander*, box turtle, snails.

Forest habitats, home ranges of 11-50 acres:

Wood turtle*, timber rattlesnake * (the timber rattlesnake is an endangered species in Massachusetts, which is not listed as being located in Shutesbury by the NHESP).

Wetland and open habitat areas:
Snapping turtle, spotted turtle*.

Rare Fish and Wildlife Species

As stated above under Rare and Endangered Plant species, the NHESP maintains statewide records and maps of state-listed rare plant and animal species identified and documented by scientists (subject to the limitation that statewide comprehensive surveys for rare species have never been undertaken). The Town of Shutesbury provides habitat for seven wildlife species that are documented as Threatened and of Special Concern (*see Table 1-8*). The species that most often catch the public’s eye are those that are considered “desirable” such as the Atlantic Salmon. While the importance of this species is undeniable, lesser-known species should not be overlooked since all play a crucial role in ecosystem health. Given this reality, protecting the habitat areas of these species should be considered a top priority.

Table 1-8: Rare Fish and Wildlife Species Rated as Threatened and of Special Concern and Found in the Town of Shutesbury

Scientific Name	Common Name	Taxonomic Group	Rank
<i>Clemmys guttata</i>	Spotted Turtle	Reptile	Special Concern
<i>Clemmys insculpta</i>	Wood Turtle	Reptile	Special Concern
<i>Notropis bifrenatus</i>	Bridle Shiner	Fish	Special Concern
<i>Hemidactylium scutatum</i>	Four-Toed Salamander	Amphibian	Special Concern
<i>Ambystoma opacum</i>	Marbled Salamander	Amphibian	Threatened
<i>Gyrinophilus porphyriticus</i>	Spring Salamander	Amphibian	Special Concern
<i>Sorex palustris</i>	Water Shrew	Mammal	Special Concern

Source: Mass. Natural Heritage and Endangered Species Program Website, 2002.

2000-2002 Biodiversity Days Inventory

According to the inventory lists acquired through the Massachusetts Executive Office of Environmental Affairs’ Biodiversity Days website, there were 617 sightings of plants and animals in town recorded by residents during field trips over the past three years. This list includes ninety-four trees and shrub species, ninety-nine wildflowers, nineteen different ferns and fern allies, grasses, sedges, and rushes, birds, fish, insects, bats, and mammals.

Natural Heritage Endangered Species Program: Estimated Habitats of Rare Wildlife and the BioMap

The NHESP publishes the Massachusetts Natural Heritage Atlas, which includes maps that show Priority Habitats of Rare Species and Estimated Habitats of Rare Wildlife and Certified Vernal Pools. This information is also available as digital data provided through the state’s MassGIS office. According to the 2000-2001 Atlas, several rare species habitats are located within Shutesbury (*see Water Resources and Wildlife Habitat Map*). These habitats can be found in the following locations in the Town of Shutesbury: in the eastern section of

Shutesbury along Atherton Brook and within the Quabbin Watershed; lands surrounding the Atkins Reservoir on the western border with the Town of Amherst; in the southwestern-most corner of Shutesbury on its border with Amherst and Pelham; and along Roaring Brook near Pratt Corner Rd.

To supplement the specific rare species habitat information and mapping described above, and to preserve and sustain the Commonwealth's biodiversity on a more comprehensive scale, in 2001 the NHESP published the *BioMap, Guiding Land Conservation for Biodiversity in Massachusetts*. The NHESP's BioMap is based upon a scientific distillation of existing data of endangered species and natural community data to identify the areas most in need of protection in order to protect the native biodiversity of the Commonwealth. The BioMap project is intended to promote the strategic land protection of areas that provide suitable habitat over the long term for the maximum number of Massachusetts terrestrial and wetland plant and animal species and natural communities. The BioMap shows areas designated as Core Habitats and Supporting Natural Landscapes. The Core Habitat areas include the most viable habitat for rare plants and rare animals and exemplary natural communities. The Supporting Natural Landscapes includes buffer areas around the Core Habitats, large undeveloped patches of vegetation, large "roadless" areas, and undeveloped watersheds. The Core Habitat areas were identified through existing data and field surveys, and support viable long-term populations of rare plant and animal species. The Supporting Natural Landscape areas were determined through analyses using Geographic Information Systems (GIS) mapping programs.

According to GIS data, Core Habitat covers approximately 7,315 acres or 42 percent of the town. Supporting Natural Landscape Covers approximately 3,077 acres or 18 percent of the town. The largest Core Habitat area is located within the Quabbin Watershed (6,794 acres or 93% of all the Core Habitat area). West of the Quabbin Watershed Core Habitat are three smaller but significant Core Habitats. Just over one mile to the southwest of the Quabbin Core Habitat in Belchertown is the Holyoke Range Core Habitat. Approximately five miles to the west is the Mt. Toby Core Habitat and to the northwest, another five miles is the Montague Plains Core Habitat. A review of the BioMap shows that there is only a third of a mile gap between the Quabbin sub-watershed and the Mt. Toby Core Habitats, via a Core Habitat area and Supporting Natural Landscapes in Shutesbury. The Core Habitat area in Shutesbury, other than that of the Quabbin sub-watershed, is located in the Roaring Brook sub-watershed, northwest of the intersection of Montague Road and Leverett Road. Bridging this gap would seem to support the long-term viability of plant and animal populations and potentially the movement of some species between core habitat areas (*see Open Space Map*).

Conserving Shutesbury's Biodiversity: Protecting Core Habitat Areas, Supporting Natural Landscapes, and Large Blocks of Contiguous Forest

Overall, 78 percent of the respondents to the Shutesbury Master Plan Survey felt that it was very important to conserve wildlife habitat. A review of the Biodiversity Days 2000-2002 list of plant and animal sightings in Appendix B signifies that Shutesbury's forests and wetlands, brooks, ponds, lakes and reservoirs are teeming with a great variety of life.

A discussion on the ways the Town of Shutesbury can continue to provide habitat for this great number of species must consider many factors including the impacts of development on habitats; the location of existing open space lands in relation to the very large and protected wildlife habitat area in the Quabbin Watershed; and the manner in which conservation planning will deal with the different movement and habitat needs of wildlife in the future. There are two concepts that can be used to help explain Shutesbury's options for pursuing the conservation of the town's biodiversity: Island Biogeography and landscape ecology models.

The study of Island Biogeography shows that biodiversity is greater on large islands than on small ones and greater on islands that are closer to the mainland. This has been extended to the idea of islands of protected open space surrounded by developed areas with the conclusion that increasing the size of a protected area increases its biodiversity. This suggests that connecting two already protected areas with a protected corridor to create one large area from two smaller separated ones will also increase natural biodiversity. The principles of Island Biogeography also suggest that biodiversity increases with proximity to other protected areas, so that nearby protected land is also valuable for this purpose.

Another model for planning for wildlife habitat protection is "Aggregate with Outliers," which is described in Richard T. T. Forman's book, "Land Mosaics." Such a landscape configuration would aggregate like uses while still allowing small bits of other uses. In Shutesbury the model is already somewhat reflected in the two more densely developed areas (Lake Wyola and Shutesbury Center), the large unfragmented blocks of protected forest, the very small patches of open land, and the residential development aggregated along roads.

Individuals of wildlife and fisheries populations move within a landscape. When and where wildlife and fish species move is not completely understood by wildlife biologists. What is known is that given a mostly undeveloped landscape, as in Shutesbury, animals pay little attention to political boundaries or the presence of homes scattered along roadways. However, in a mostly developed landscape, as can be seen in some eastern Massachusetts communities within the Rte. 495 corridor, wildlife seek natural cover for shelter and food, but some species willingly forage where human uses, such as gardens or horticultural and ornamental plantings, provide browse or food. As the forest land within Shutesbury continues to be fragmented by development, remaining large blocks of undeveloped forest and the parcels of land connecting them together will become more important to area wildlife.

Connections between bodies of water and sub-watersheds are also important for wildlife and fisheries species. The more common animals that utilize the river and stream corridors are beaver, muskrat, raccoon, green heron, king fisher, bittern, snapping turtle, and many species of ducks, amphibians, and fish. Since many species rely on a variety of habitats during different periods of their life cycle, species diversity is greatest in areas where several habitat types occur in close proximity to each other. With this in mind, the protection of all habitat types is vital for maintaining and enhancing biodiversity in Shutesbury.

How will residents and town officials determine the quality of the wildlife habitat in Shutesbury and the most appropriate conservation strategies? There are three general paths

to follow in conserving the health of wildlife populations. One way is to protect the habitat of specific species that are rare, threatened, or endangered, which might be accomplished by protecting the BioMap Core Habitat Areas, the Estimated Habitats of Rare Wildlife, and the Estimated Priority Habitats of Rare Species. It is thought that while protecting their habitats other species will also benefit. A second path is to conserve certain landscape-level resources like large contiguous forests or riparian habitats along rivers, which is similar to protecting the BioMap Supporting Natural Landscapes. This helps to conserve the habitats of a large number of species but it might lose sight of some rare and endangered species. However, conserving the long-term biodiversity of Shutesbury will likely require a combination of the first two paths. This third approach is to protect the BioMap core habitat areas, the supporting natural landscapes, (plus any additional rare species habitats and special or unique communities and features not identified in the BioMap project), and the lands that link them across a regional landscape.

Recognizing the general areas where wildlife mate, feed, and travel is often the first step. Large, round forest patches of more than 185 acres provide interior forest habitats for a variety of birds and mammals, as well as protection of first and second order stream tributaries (Formann; 1995). Networks or greenways of protected forestland or vegetated riparian corridors are resources that will help to sustain populations of animals that require diverse habitats over time and space. There is a great degree of forestland that is protected stretching from Warwick through the eastern half of Erving, to Wendell, Shutesbury, and New Salem to the Quabbin Watershed and west to the Connecticut River riparian corridor. Shutesbury's sparsely populated terrain contributes to the wildlife value provided by the protected forestland throughout this greenway.

Another way of categorizing forestland is by comparing blocks of forest by their degree of fragmentation. In other words, areas of contiguous forest, unbroken by paved roads, power lines, or development have a higher habitat value for wildlife populations, which require deep forest cover. Since fragmentation of forestland is a direct outcome of development, edge habitats (e.g. zones of change between forests and development) would not be as high a priority for conservation as large blocks of forest. The Franklin County Contiguous Forest by Forest Acreage Map (Contiguous Forest Map) identifies areas of contiguous forest by size class. Blocks of contiguous forest were identified using GIS mapping techniques. The method used included buffering all land uses other than forest and forested wetlands by 100 feet. The blocks of contiguous forest were identified as separate units and their areas in acres were measured.

The Contiguous Forest Map shows blocks of forest by size class in Shutesbury and surrounding towns. Shutesbury contains portions of two blocks of forest each greater than 10,000 acres in size. One stretches north of Cooleyville Road and east of Wendell Road into southeastern Wendell and northwestern New Salem. This northeastern forest block is found within the Quabbin Reservoir and Lake Wyola Sub-watersheds and contains both Core Habitat Areas and Supporting Natural Landscapes. Another 10,000 acre block of contiguous forest lies southeast of Rte. 202 and runs into New Salem. This large southeastern forest block is also in the Quabbin Sub-watershed and is considered a Core Habitat. Only one other region in Franklin County contains blocks of contiguous forest of this size class: the Heath-Charlemont-Colrain forest block.

Another large block of contiguous forest (5,000 –10,000 acres in size) lies west of Montague Road. This forest block includes Brushy Mountain, the area in Shutesbury known as the Plains, and the only Core Habitat Area in Shutesbury outside of the Quabbin Sub-watershed. There are blocks of forest between 1,000 and 5,000 acres in size located south of Leverett Road in the Quabbin, Amethyst, and Adams Brook Sub-watersheds. These southern forest blocks protect valuable drinking water supplies.

Forests have always been known to play an important role in providing habitat for many plant and wildlife species. Since the 1980s it has been commonly thought that New England forests have lacked the diversity of stand age classes, which existed in the earlier part of the century due to the presence of many old fields. One of the ways used to create more acres of young forest was by clearcutting trees in small patches throughout a woodland. Foresters considered this to be a choice wildlife habitat treatment for producing early successional habitats within a managed woodland. Periodic heavy logging of forestland can also create early successional habitats. The Massachusetts Division of Fisheries and Wildlife (DFW) uses a percentage of the income derived from hunting and fishing licenses for the purchase of wildlife habitat and important research into wildlife management. On some of their properties the DFW reclaims old fields with large brush cutting machinery for the purpose of creating habitats for wildlife that require young tree and shrub communities common to early successional landscapes. The species that inhabit these early successional landscapes include common game species and many rare and endangered species. Any open land in Shutesbury is thus extremely important as potential habitat for species requiring early successional habitats.

Shutesbury clearly has a wonderful resource in both its wildlife and its diverse habitats. Town officials and concerned citizens may need to take action to conserve thriving plant and animal communities in Shutesbury. The conservation strategies that the town pursues over time may involve continued and increased monitoring of species locations, numbers, and movements; the protection of unprotected core habitat areas, as identified by the NHESP BioMap that includes estimated habitats of rare wildlife (*see Open Space Map*); the continued protection and linking of large blocks of contiguous forestland, which comprises Shutesbury's Supporting Natural Landscape; the creation and retention of early successional habitats like fields and grasslands; and the protection of vernal pools and associated uplands, wetlands, and riparian corridors that sustain the greatest diversity of life in Shutesbury.

Open Space

The following section, Open Space, inventories public and private lands in the Town of Shutesbury, which are valued for their conservation and recreation resources and, which also have some level of protection from development. Although descriptions of a select set of town-owned open space parcels include their recreational values, descriptions of these lands will be covered in greater detail in the Master Plan Chapter, Community Facilities and Services.

Why does a town, as rural as Shutesbury, need to engage in open space planning? Some communities along the Route 495 corridor in eastern Massachusetts initiated open space protection programs only after their remaining forests and farmland had become targeted for development. Unfortunately, if Shutesbury were to wait for development pressures to intensify before protecting land it could find house lots covering the recharge area for current or future groundwater supplies, or find the cost of open space protection prohibitive.

The phrase "open space protection" refers to any number of mechanisms that help to keep land from being developed or in other words, converted to commercial, industrial, or residential land uses. The term "**protected**" for the purposes of this Master Plan indicates that no development may take place and a conservation restriction or some other legal mechanism is attached to the deed. In addition, land is considered protected from development when it is owned by the Commonwealth of Massachusetts and managed by a state conservation agency like the Department of Conservation and Recreation (DCR). Land is also considered protected when it is owned by a town and under the authority of the Conservation Commission, or when it is owned by a land trust for conservation purposes. Changing the level of protection for any parcel of land that is owned by a state conservation agency, a land trust, or by a town for conservation purposes, requires a vote by two thirds of the State Legislature as outlined in Article 97 of the Amendments to the Massachusetts State Constitution. For the purposes of this Master Plan, an additional type of open space will be considered as protected from development: cemeteries.

A parcel of land in Massachusetts may be considered to have "**limited protection**" from development when a town water department or water district owns it. Unless there is a legal restriction attached to the deed, the level of protection afforded these types of parcels varies depending on the policies of each community. In most cases the town or water district would be required to show the Massachusetts Department of Environmental Protection just cause for converting the use of the land. However, this is not an insurmountable hurdle. Athol recently took their surface drinking water supplies off-line after developing the productive Tully River well-field. A change in land use around the reservoir may be in the offing, from watershed protection to active recreational uses.

Land owned by the Town of Shutesbury and used for recreation or conservation purposes but not under the authority of the Conservation Commission is "**unprotected, undeveloped town land.**" The parcel in question could be used as a soccer field or it could be in forest, but not have the long-term protection afforded by Conservation Commission lands. In this case, converting a soccer field to a built use like a new school could be decided by the Select Board.

"**Temporarily protected**" parcels are those that are enrolled in the Chapter 61 tax abatement programs. They offer landowners a reduction of their local real estate property taxes in return for promising that the predominant use of the land will be as productive forest, agriculture or for use as open space for a period of time. These tax abatement programs help landowners by reducing their property taxes while they grow forest products and keep land undeveloped. By keeping forest and fields in their undeveloped states, lands in these programs provide many public benefits from retaining the value of the region's wildlife

habitats and recreational open space to sustaining Shutesbury’s rural character, and keeping property taxes down since the use requires very little in the way of town services. Another benefit of the tax abatement programs is that they can provide Shutesbury an opportunity to protect land. When a parcel, which has been enrolled in one of the Chapter 61 programs is put up for sale, or when the current owner initiates plans to convert the land to a use different than is described by the abatement program, the town is guaranteed a 120-day waiting period during which it can exercise its right-of-first-refusal to purchase the property. However, an important limitation of the Chapter 61 programs is that a landowner can remove property from the program and pay any back taxes that may be owed, and after a period of time (120 days) during which the town has the right of first refusal, sell or convert the land to another use. Table 1-9 lists the amount of acres of these categories of undeveloped open space in town by level of protection and ownership.

Table 1-9: Number of Acres of Protected Open Space in Shutesbury by Level of Protection from Development and by Owner

LAND PROTECTED FROM DEVELOPMENT	Number of Acres
<i>Publicly Owned</i>	
Commonwealth of Massachusetts – Department of Conservation and Recreation (Division of Water Supply Protection)	5,035.5
Commonwealth of Massachusetts – Department of Conservation and Recreation	757
Town of Shutesbury – Cemeteries	10
Town of Shutesbury – Conservation Commission	135.4
Connecticut River Watershed Council (Public non-profit)	<u>1</u>
Total Publicly Owned	5,939
<i>Privately Owned</i>	
Land protected with a Conservation Restriction	314.3
Land protected with an Agricultural Preservation Restriction	137
Jewish Community of Amherst Cemetery	<u>2</u>
Total Privately Owned	453
Total Land Protected from Development	6,392
LANDS WITH LIMITED PROTECTION FROM DEVELOPMENT	
<i>Publicly Owned</i>	
Town of Amherst – Atkins Reservoir Water Supply Protection Land	<u>677</u>
Total Land with Limited Protection	677
UNPROTECTED AND UNDEVELOPED TOWN LAND	
Town of Shutesbury	<u>37.5</u>
Total Unprotected Undeveloped Town Land	38
LANDS TEMPORARILY PROTECTED FROM DEVELOPMENT	
<i>Privately Owned</i>	
Chapter 61 – Forestry	5,555.9
Chapter 61A - Agriculture	68
Chapter 61B – Recreation	<u>457.2</u>
Total Land with Temporary Protection	6,081
Total Land of Conservation and Recreation Interest with Some Level of Protection from Development or with Town Ownership	13,188

Source: Town of Shutesbury Assessors Records, 2003.

It is important for the Town of Shutesbury to consider land under Chapters 61, 61A or 61B as unprotected, or “**temporarily protected.**” At the same time, the value the program offers to the town should not be disregarded. The Shutesbury Planning Board and Conservation Commission have already begun to take advantage of the town’s right-of-first-refusal, as with the South Brook property, and with Haskins Meadow earlier. Identifying key parcels and building partnerships with local land trusts and landowners can be an effective planning process resulting in efficient land protection projects. Shutesbury may not need to purchase the land with town funds. The right-of-first-refusal can be given to a land trust, which can often respond much more quickly than the town can.

Inventory of Types of Open Space

The following section inventories all of the parcels of land that fall within three categories of open space. These parcels are listed by protection status: protected, limited protection, and temporary protection. These resources are identified on the Open Space Map found at the end of this chapter. It is important to note that there maybe other lands of significant conservation and/or recreation interest to the town that are not inventoried here, simply because they do not fall within these three categories. For example, a parcel of land might not be listed here that includes important wetlands, rare species, or other significant or unique features (including the fact that its location provides a link between important blocks or corridors of protected or otherwise important conservation or recreation lands).

Protected Parcels

Overall, the 6,392 acres of protected land in Shutesbury represent 37 percent of the total land area in town (17,342 acres). Developing these protected parcels for other than conservation use would require an affirmative vote by two thirds of the State Legislature. This is what separates different levels of open space protection, the ease in which its conservation status may be overturned. Lands that are protected from development in the Town of Shutesbury include both publicly and privately owned land. The publicly owned parcels are owned by the Town of Shutesbury’s Conservation Commission and the Commonwealth of Massachusetts and managed by the Department of Conservation and Recreation (Division of Water Supply Protection). A public non-profit, the Connecticut River Watershed Council, owns one one-acre parcel in Shutesbury off Jennison Road. The privately held parcels of land, which are protected from development in perpetuity, include lands that have conservation easements attached to their deeds. For example, the development rights for the Banfield Parcels are held in perpetuity by the Department of Food and Agriculture through their Agricultural Preservation Restriction (APR) Program.

The parcels listed in Table 1-10 show ownership status and owner. In addition, the parcels’ Assessors information is also listed including the map and lot numbers and assessed acreage. Following the table are descriptions of each parcel or group of parcels depending on ownership. For example, the Department of Conservation and Recreation (Division of Water Supply Protection) is represented in the table as many separate parcels that are described together in the text.

Table 1-10: Open Space Parcels in Shutesbury Protected from Development

Ownership Status	Owner	Assessors' Map #	Assessors' Lot #	Assessors' Acreage
Publicly Owned	Commonwealth of Massachusetts/Department of Conservation and Recreation (DCR)			
	<i>Shutesbury State Forest</i>	M	33	50
		M	34	27
		M	35	29
		M	36	26
		M	37	26
		M	41	10
		N	23	45
		N	37	46
		N	51	25
		N	55	1
		N	61	50
		N	62	50
		N	66	43
		N	67	55
		N	68	80
		N	69	<u>152</u>
	Total			715
	<i>Lake Wyola State Park</i>	B	648	0.1
		C	5	31
		C	9	8
		C	11	<u>3</u>
	Total			42
	Total DCR Lands			757
Publicly Owned	Commonwealth of Massachusetts/Department of Conservation and Recreation (Division of Water Supply Protection)			
	<i>Quabbin Reservoir Watershed Land</i>	J	1	32
		J	2	30
		J	5	44
		J	6	44
		J	7	9
		K	1	11
		K	2	20
		K	3	41
		K	4	10
		K	6	10
		K	7	5
		K	10	51
		K	12	16
		K	13	30
		K	14	72
		K	15	5
		K	16	53
		K	21	14
		L	1	21
		L	2	15

Ownership Status	Owner	Assessors' Map #	Assessors' Lot #	Assessors' Acreage
Publicly Owned	<i>Quabbin Reservoir Watershed Land (Continued)</i>	L	4	24
		L	5	21
		L	6	10
		L	7	30
		L	8	22
		L	10	23
		L	11	61
		L	12	19
		L	13	19
		L	14	8
		L	23	6
		L	24	151
		L	25	95
		L	26	70
		L	27	61
		M	17	27
		M	19	3
		M	21	21
		M	31	42
		M	32	50
		M	38	5
		N	6	0.1
		N	7	0.2
		N	8	5
		N	9	0.3
		N	10	44
		N	11	5
		N	12	9
		N	13	8
		N	14	1
		N	15	12
		N	18	98
		N	19	8
		N	20	26
		N	21	51
		N	22	15
		N	25	45
		N	26	25
		N	27	8
		N	28	47
		N	29	43
		N	30	87
		N	31	12
		N	32	17
		N	33	10
		N	35	9
		N	36	26
		N	38	17
		N	39	16
		N	40	30
		N	41	51

Ownership Status	Owner	Assessors' Map #	Assessors' Lot #	Assessors' Acreage
Publicly Owned	<i>Quabbin Reservoir Watershed Land (Continued)</i>	N	42	14.6
		N	43	14
		N	44	161
		N	46	131
		N	47	34
		N	48	79
		N	49	15
		N	50	19
		N	52	23
		N	53	20
		N	54	32
		N	56	17
		N	57	5
		N	58	23
		N	63	35
		N	64	60
		N	74	0.3
		N	75	1
		P	6	<u>16</u>
	Total Acreage from Assessors' parcels			2,726.5
	Remainder of DCR/DWSP land excluded from Assessors' maps.			2,309.0
	Total DCR/DWSP Lands			5,035.5.
Publicly Owned	Town of Shutesbury Conservation Commission			
	<i>Garbiel Gift</i>	B	293, 305, 306, 315 & 341	1.4
	<i>Lake Wyola Island</i>	B	679, 698	1
	<i>Lake Wyola Conservation Area</i>	B	800	48
	<i>South Brook Conservation Area</i>	E	3	49
	<i>Montague Road Lot (abuts Dudleyville marsh)</i>	F	49	3
	<i>Mt. Mineral Road Lot</i>	J	3	2
	<i>Haskins Meadow</i>	X	7	<u>21</u>
		X	34	<u>10</u>
	Total Conservation Commission Lands			135.4
	<i>West Cemetery</i>	P	29	1
		P	31	2
		P	33	1
		P	34	2
		P	35	2
		P	36	0.2
	<i>Lockes Pond Village Cemetery</i>	D	10	1
	<i>Pratt Corner Cemetery</i>	U	7	<u>0.3</u>
	Total Municipal Cemeteries Land			10
	Town Common	M	1,2,4	0.7
Public Non-Profit	Connecticut River Watershed Council	I	2	1
	TOTAL PUBLICLY OWNED PROTECTED LANDS			5,939.2

Ownership Status	Owner	Assessors' Map #	Assessors' Lot #	Assessors' Acreage
Privately Owned	Agricultural Preservation Restrictions			
	<i>Banfield (Owner), DFA (Manager)</i>	V	5	137
	Conservation Restrictions			
	<i>Levinger (Owner), DCR (Manager)</i>	K	28	131
		K	32	8
	<i>Pearson (Owner), Conservation Commission (Manager)</i>	Q	20	7
	<i>Pearson (Owner), Conservation Commission (Manager)</i>	Q	75	3
	<i>Old Orchard Homeowners Association</i>	D	32	24
	<i>(Owner and Manager)</i>	D	33	3
		D	78	0.1
		D	79	0.2
		D	98	0.4
	<i>Janowitz (Owner), DCR (Manager)</i>	K	23, 26, 118	140.6
	Total Land with Conservation Restrictions			314.3
	Privately owned Cemetery			
	<i>Jewish Community of Amherst</i>	T	115	2
	TOTAL PRIVATELY OWNED PROTECTED LAND			456.3
	TOTAL PROTECTED LAND			6,395.5

Source: Town of Shutesbury Assessors Records; 2002. *Note: The acreage figures from the 1999-2004 Open Space and Recreation Plan were used for the DCR and DCR/DWSP lands. However, due to increases in lands received by the Conservation Commission, all other acreage totals used in the total acreage figures were from 2002 Assessors' records.

Selected Publicly Owned Protected Open Space Areas

The publicly owned protected land in the Town of Shutesbury is owned by the Commonwealth of Massachusetts and the Town of Shutesbury's Conservation Commission. The State's open space is managed by the Department of Conservation and Recreation. As mentioned before, the following descriptions are for groups of parcels under the same ownership.

Landowner: Department of Conservation and Recreation (Division of Water Supply Protection).

Identifier: Quabbin Reservoir Watershed Land.

Over 5,000 acres of the Quabbin Reservoir Watershed lands and surface water define the land area of the eastern third of the Town of Shutesbury. The Quabbin Reservoir Watershed offers a number of recreational opportunities available for public use including hiking, picnicking and nature study. In the northern end of the Reservoir, fishing, boating, and hunting are permitted. Together with the Shutesbury State Forest and private lands, the DCR/DWSP lands represent a very large Core Habitat Area as is shown on the Open Space Map. According to the Natural Heritage and Endangered Species Program, protection of

Core Habitat Areas and Supporting Natural Landscapes will help to ensure the long term integrity of the region's biodiversity.

Landowner: Massachusetts Department of Conservation and Recreation (DCR).

Identifier: Shutesbury State Forest.

The Shutesbury State Forest is owned by the State and managed by DCR. Located in the northeastern section of Shutesbury, the Shutesbury State Forest is comprised of three separate groups of parcels. The largest group of parcels contains approximately 500 acres (2002 Assessors' records) and is located along Macedonia Road. The outflow of Sibley Swamp in Wendell runs through this section. The second largest group of parcels is approximately 121 acres in size and is accessed via Briggs Road on its northern end and Cooleyville Rd on its southern end. A locked gate greets visitors from Cooleyville Road. A final parcel owned by DCR is located off of New Boston Road and east of the West Branch of the Swift River. Residents enjoy hiking, fishing and hunting within the State Forest.

Landowner: Massachusetts Department of Conservation and Recreation (DCR).

Identifier: Lake Wyola State Park (Carroll Holmes Recreation Area).

In 1997, the Department of Conservation and Recreation purchased the former privately-run Lake Wyola Park. Lake Wyola State Park, as it is now known, is located on the north side of Lake Wyola. The Park offers swimming and fishing. There is a universal access beach and other universal access facilities located in the state park and recreation area. The beach is located on Lakeview Rd.

Landowner: Town of Shutesbury.

Identifier: Lake Wyola Island.

Recently the Town of Shutesbury Conservation Commission acquired a small island with access off Merrill Drive, a private way that intersects Lakeview Road near the northeastern shore of Lake Wyola. Part of the parcel also represents the land underneath the water that separates the island from shore.

Landowner: Town of Shutesbury.

Identifier: Lake Wyola Town Beach and South Brook Conservation Area.

Located on the south side of Lake Wyola in the northeast corner of the Town of Shutesbury, and accessed via Randall Road, the Town Beach Area and the two abutting conservation parcels, including the recently acquired South Brook Conservation Area, provide public access to cross country skiing, fishing, swimming, hunting, ice skating, boating, nature observation, picnicking, and snowmobiling. The Town Beach Area is accessed via Randall Road and contains a large dirt parking area for cars and boat trailers. Trails that start off Randall Road and Lock's Pond Road lead to roughly 100 acres of protected conservation land.

Landowner: Town of Shutesbury.

Identifier: Haskins Meadow.

This thirty-one (31) acre meadow area abuts Amherst and Leverett town conservation land. It appears that the best way to access the meadow is via Cushman Road in Amherst or from the closed Leverett landfill.

Landowner: Town of Shutesbury.

Identifier: Montague Road Lot.

Located at the northwestern end of Montague Road on the Shutesbury/Leverett town line.

This three-acre parcel includes upland white pine and mountain laurel and is bounded on the east by Montague Road, on the south partially by an old road to North Leverett, and on the northwest by bog.

Lands with Limited Protection from Development

Land owned by the Town of Amherst and managed by the Amherst Water Department as watershed or public water supply areas are typically considered as having limited protection from development unless there is a conservation restriction attached to the deed barring development in perpetuity (See Table 1-11).

Table 1-11: Open Space Parcels in Shutesbury with Limited Protection from Development

Owner	Assessors' Map #	Assessors' Lot #	Assessors' Acreage
Town of Amherst/ <i>Adams Brook Sub- watershed Land</i>	T	3	16
	T	4	9
	T	11	13
	T	12	24
	U	3	5
	U	5	2
	U	6	114
	U	8	14
	U	9	136
	U	12	10
	U	13	67.3
	U	26	9
	U	44	1
	V	7	6
	V	8	2
	V	12	2
	V	13	21
	V	32	8
	W	1	7
	W	2	1
	W	3	0.1
	W	7	0.4
	W	8	15.6
	W	9	14
	W	10	28
	W	11	20
	W	12	22
	W	13	11
	W	14	12
	W	29	70
	W	31	2
	W	33	1

Owner	Assessors' Map #	Assessors' Lot #	Assessors' Acreage
Town of Amherst/ <i>Adams Brook Sub- watershed Land</i>	W	47	0.4
	X	1	4
	X	2	9
	X	3	0.4
Total Town of Amherst Land			677

Source: Town of Shutesbury Assessors Records; 2002.

Unprotected Undeveloped Town Land

Unprotected undeveloped town land includes parcels that may be currently used for recreational or conservation purposes that are under the control of the Select Board. In this case changing a parcel's use from forestland for example to the site of a new elementary school may require a Select Board vote, but not an affirmative vote by two thirds of the State Legislature.

Table 1-12: Unprotected and Undeveloped Town Land with Conservation and Recreational Value

Location of Town Land	Assessors' Map #	Assessors' Lot #	Assessors' Acreage
<i>Lake Wyola-southeastern parcel(water and wetland)</i>	A	49	3.6
<i>Lake Drive rectangular lot</i>	B	10	0.1
<i>Oak Knoll rectangular lot</i>	B	22	0.1
<i>Great Pines Drive rectangular lot</i>	B	27	0.1
<i>Great Pines Drive rectangular lot</i>	B	28	0.1
<i>Lockes Pond Road rectangular lot</i>	B	153	0.1
<i>Great Pines Drive rectangular lot</i>	B	167	0.1
<i>Great Pines Drive rectangular lot</i>	B	169	0.1
<i>Watson Straights triangular lot</i>	B	524	0.1
<i>Lake Shore Drive rectangular lot</i>	B	661	0.1
<i>Lakeview Road rectangular lots</i>	B	709,710	0.2
<i>Mt. Mineral Road lot</i>	J	3	1.7
<i>Wendell Road Lot</i>	M	30	8
<i>New Boston Road rectangular lot</i>	N	65	11.1
<i>New Boston Road triangular lot</i>	N	70	2.7
<i>Town Soccer Field Behind Fire Station</i>	O	37, 38	3
<i>Town land (McNeil lot) behind Town Hall</i>	O	43	3
<i>Town field behind Town Hall</i>	O	47	3
<i>Town land (McNeil lot) behind Town Hall</i>	O	48	6
<i>Old Town Pound</i>	O	55	0.1
<i>Rose Lot</i>	O	68	2.6
<i>Cyrus Hill Lane</i>	S	2	0.3
<i>Elementary School Playing Fields and Woods</i>	T	78	8
<i>Cyrus Hill Home site (c. 1875)</i>	U	23	0.13
Total Shutesbury Unprotected Undeveloped Land			37.5

Source: Town of Shutesbury Assessors Records; 2002.

Much of the land in this category is used for recreational purposes including the fields in back of the Fire Station, Elementary School, the Town Common, and the field in back of the

Town offices. Although a portion of these parcels have already been developed, some of the land remains as undeveloped open space. There are also a number of parcels owned by the town surrounding Lake Wyola. Some of these parcels are small, unmarked and may require more inspection to ensure that their use is consistent with town policies. A more detailed assessment of each parcel will be included in the Community Facilities and Services Chapter of the Master Plan (*see Table 1-12*).

Parcels Temporarily Protected from Development

In Massachusetts, parcels of open space that are considered to be temporarily protected from development are those that are enrolled in the State’s tax abatement programs, Chapter 61, 61A, and 61B (*see Table 1-13*).

Table 1-13: Privately Owned Open Space Parcels in Shutesbury with Temporary Protection from Development

Ownership Status	Owner	Assessors’ Map #	Assessors’ Lot #	Acreage
Chapter 61	HEMINGWAY JAMES C	D	12	48
	KRAFCHUK ELIZABETH	D	14	65
	CITINO FRANK	D	16	33
	OLSZEWSKI MARK	D	18	17
	BROWN ROBERT S ESTATE	D	20	68
	BROWN ROBERT S	D	21	65
	BROWN ROBERT S	D	24	15
	MILLER JEAN	D	25	11
	MILLER JEAN	D	28	55
	MILLER JEAN	D	29	34
	FOOTIT BARBARA F	D	31	36
	W D COWLS INC	D	37	11.5
	W D COWLS INC	D	39	45.7
	MILLER JEAN	D	41	1.3
	CRAWFORD MOORE LLC	D	102	74
	CRAWFORD MOORE LLC	D	103	3
	CRAWFORD MOORE LLC	D	104	5
	FOOTIT BARBARA	E	2	252
	PUFFER STEPHEN J	F	1	32
	W D COWLS INC	F	15	64.89
	W D COWLS INC	F	16	12.5
	W D COWLS INC	F	17	69.4
	PUFFER EDWARD K	F	23	86
	W D COWLS INC	F	24	95.5
	W D COWLS INC	F	25	13
	W D COWLS INC	F	30	4
	W D COWLS INC	F	32	119
	BONNAR DEACON	F	34	15

Ownership Status	Owner	Assessors' Map #	Assessors' Lot #	Acreage
Chapter 61 (Continued)	MIZOUR CAROLE J	F	35	22
	W D COWLS INC	F	37	7.4
	W D COWLS INC	F	38	10.2
	W D COWLS INC	F	39	40.9
	W D COWLS INC	F	40	20
	W D COWLS INC	F	41	20
	MILLER JEAN G	F	45	19
	MILLER JEAN G	F	47	30.2
	W D COWLS INC	F	53	4.6
	W D COWLS INC	F	100	1
	W D COWLS INC	F	101	1
	W D COWLS INC	F	102	1
	W D COWLS INC	F	103	1
	W D COWLS INC	F	104	1
	W D COWLS INC	F	116	1
	W D COWLS INC	F	117	1
	W D COWLS INC	F	118	1
	W D COWLS INC	F	119	1
	W D COWLS INC	F	120	1
	W D COWLS INC	F	121	1
	W D COWLS INC	F	122	1
	W D COWLS INC	F	123	1
	W D COWLS INC	F	124	1
	W D COWLS INC	F	126	2
	W D COWLS INC	F	127	2
	W D COWLS INC	F	128	2
	W D COWLS INC	F	129	2
	W D COWLS INC	G	2	811
	W D COWLS INC	G	3	0.3
	W D COWLS INC	G	4	2.2
	W D COWLS INC	G	5	0.9
	W D COWLS INC	G	6	20.1
	W D COWLS INC	G	8	2.5
	W D COWLS INC	G	25	1
	W D COWLS INC	G	26	1
	W D COWLS INC	G	27	1
	W D COWLS INC	G	28	1
	W D COWLS INC	G	29	1
	W D COWLS INC	G	32	1
	W D COWLS INC	G	33	1
	WATKINS LEE MARK	H	10	16
	W D COWLS INC	H	12	0.7

Ownership Status	Owner	Assessors' Map #	Assessors' Lot #	Acreage
Chapter 61 (Continued)	W D COWLS INC	H	13	7.6
	W D COWLS INC	H	30	33.9
	RICHTER SCOTT S	H	36	46.5
	RICHTER SCOTT S	H	37	100
	W D COWLS INC	H	46	24
	W D COWLS INC	H	47	25.6
	W D COWLS INC	H	48	7.5
	W D COWLS INC	H	49	7.3
	W D COWLS INC	H	51	5.8
	HAYES RAYMOND & JOANNA	H	54	24
	PLAZA JAMES M	H	56	14
	W D COWLS INC	H	57	6.2
	W D COWLS INC	H	58	16.8
	W D COWLS INC	H	59	2.4
	W D COWLS INC	H	60	19
	W D COWLS INC	H	145	1
	W D COWLS INC	H	146	1
	W D COWLS INC	H	147	1
	W D COWLS INC	H	148	1
	W D COWLS INC	H	149	1
	W D COWLS INC	H	150	1
	DALE BRIAN J. & PATRICIA M.	K	8	1.8
	DALE BRIAN J	K	9	16.3
	TEMENOS INC	K	17	22
	TEMENOS INC	K	18	46
	LEVINGER GEORGE K	K	27	77.3
	DALE BRIAN J	K	36	1.9
	DALE BRIAN J	K	119	1.2
	PERRY ANNETTE	L	16	74
	W D COWLS INC	L	20	25
	W D COWLS INC	L	21	13.5
	W D COWLS INC	L	22	13.3
	VOGES FORREST	M	20	19
	SMITH MIRANDA K	M	80	13
	W D COWLS INC	N	34	12
	W D COWLS INC	O	6	54.1
	W D COWLS INC	O	8	6.7
	W D COWLS INC	O	9	7.5
	W D COWLS INC	O	10	5
	W D COWLS INC	O	11	52.1
	W D COWLS INC	O	12	68.7
	W D COWLS INC	O	13	26

Ownership Status	Owner	Assessors' Map #	Assessors' Lot #	Acreage
Chapter 61 (Continued)	W D COWLS INC	O	14	18
	W D COWLS INC	O	15	22
	W D COWLS INC	O	16	3.3
	SPRINGER ALBERT E	O	18, 113	107.8
	WATERMAN EARL A	O	21	27
	W D COWLS INC	O	23	16
	SPRINGER ALBERT E	O	84	1.5
	W D COWLS INC	O	101	1
	W D COWLS INC	O	103	1
	W D COWLS INC	O	104	1
	W D COWLS INC	O	105	1
	W D COWLS INC	O	106	1
	W D COWLS INC	O	107	1
	W D COWLS INC	O	108	1
	W D COWLS INC	O	109	1
	LAUDER DAVID M	O	118	84
	ASHCRAFT BARR	P	2	14
	POTYRALA CHESTER P	P	3	48
	W D COWLS INC	P	7	55
	W D COWLS INC	P	9	7.1
	W D COWLS INC	P	12	7.4
	GJELTEMA ROLAND W AS TRUSTEE	P	13	80
	KENERSON LAUREY C	P	37	7
	KENERSON LAUREY C	P	38	14
	W D COWLS INC	P	69	1
	W D COWLS INC	P	70	1
	W D COWLS INC	Q	6	61
	MARGLIN STEPHEN	Q	11	12
	W D COWLS INC	Q	12	38.4
	W D COWLS INC	Q	17	10.1
	W D COWLS INC	Q	23	70.7
	W D COWLS INC	Q	25	23.6
	W D COWLS INC	Q	29	11.6
	MARGLIN STEPHEN	Q	51	14
	HANKOWSKI MARY	Q	70	21
	MCLEAN DANIEL G	R	3, 4, 25	37.5
	WEILERSTEIN PHILIP J	R	7	0.6
	WEILERSTEIN PHILIP J	R	26	2.1
	W D COWLS INC	R	27	1
	FOSTER WINTHROP JR	S	1	17
	FOSTER WINTHROP JR	S	3	42
	PLAZA ALPHONSE & RITA	S	36	10

Ownership Status	Owner	Assessors' Map #	Assessors' Lot #	Acreage
Chapter 61 (Continued)	W D COWLS INC	T	2	5.4
	W D COWLS INC	T	5	16.3
	W D COWLS INC	T	7	23
	GAGE ROBERT W	T	8	12
	W D COWLS INC	T	9	21.9
	W D COWLS INC	T	10	0.6
	W D COWLS INC	T	13	12.4
	W D COWLS INC	T	15	111
	W D COWLS INC	T	16	188.9
	W D COWLS INC	T	23	11
	W D COWLS INC	T	24	13.1
	W D COWLS INC	T	26	26.3
	W D COWLS INC	T	27	12.9
	W D COWLS INC	T	28	13.6
	W D COWLS INC	T	29	22.5
	W D COWLS INC	T	30	29.8
	W D COWLS INC	T	31	55.9
	W D COWLS INC	T	32	25
	ROY JEFFREY J	T	34	17
	W D COWLS INC	T	35	16.6
	W D COWLS INC	T	49	17.1
	W D COWLS INC	T	50	25.2
	W D COWLS INC	T	51	9.4
	W D COWLS INC	T	52	17.9
	W D COWLS INC	T	53	11.8
	W D COWLS INC	T	55	13
	W D COWLS INC	T	56	9.5
	W D COWLS INC	T	57	11
	W D COWLS INC	T	58	10
	W D COWLS INC	T	103	23.2
	W D COWLS INC	T	142	2
	W D COWLS INC	T	143	1
	W D COWLS INC	T	144	1
	W D COWLS INC	T	145	1
	W D COWLS INC	T	146	1
	W D COWLS INC	T	147	1
	W D COWLS INC	T	148	1
	W D COWLS INC	T	149	1
	W D COWLS INC	T	152	1
	W D COWLS INC	T	153	1
	W D COWLS INC	T	154	1
	W D COWLS INC	U	2	8.3
	W D COWLS INC	U	4	131.9

Ownership Status	Owner	Assessors' Map #	Assessors' Lot #	Acreage
Chapter 61 (Continued)	W D COWLS INC	U	11	5.1
	HOUSTON THOMAS F	U	17	3
	BANFIELD-WEIR K & C	V	1	1
	STERN FAMILY ROVOCABLE TRUST	V	6	23
	W D COWLS INC	W	6	21.8
	W D COWLS INC	W	21	6.2
	W D COWLS INC	W	22	3.2
	W D COWLS INC	W	23	25.4
	W D COWLS INC	W	24	6.8
	W D COWLS INC	W	25	10.9
	W D COWLS INC	W	26	22.4
	W D COWLS INC	W	27	34.6
	W D COWLS INC	W	28	41.4
	W D COWLS INC	W	34	42.9
	W D COWLS INC	W	35	6.4
	W D COWLS INC	W	36	6.2
	W D COWLS INC	W	37	15.4
	W D COWLS INC	W	38	12.6
	W D COWLS INC	W	40	8.1
	W D COWLS INC	W	41	8
	W D COWLS INC	W	42	16.9
	W D COWLS INC	W	43	31.4
	W D COWLS INC	W	44	12.2
	W D COWLS INC	W	45	7.8
	W D COWLS INC	W	48	19.6
	W D COWLS INC	W	95	1
	W D COWLS INC	W	96	1
	W D COWLS INC	W	97	1
	W D COWLS INC	W	98	1
	W D COWLS INC	W	99	1
	W D COWLS INC	W	100	1
	W D COWLS INC	W	101	1
	W D COWLS INC	W	102	1
	W D COWLS INC	W	103	1
	W D COWLS INC	X	4	0.4
	W D COWLS INC	X	5	12.6
	W D COWLS INC	X	22	0.6
TOTAL CH. 61				5,555.89
Chapter 61 A	HAYES RAYMOND J	H	53	<u>68</u>
TOTAL CH. 61A				68

Ownership Status	Owner	Assessors' Map #	Assessors' Lot #	Acreage
Chapter 61B	GREENBAUM HILDA TRUSTEE OF REV.	D	35	21
	CLARK THOMAS	G	18	2
	CLARK THOMAS	G	19	1
	CLARK THOMAS	G	20	1
	CLARK THOMAS	G	21	1
	CLARK THOMAS	G	22	1
	CLARK THOMAS	G	35	2
	ARMSTRONG JR RALPH J	H	4	9
	GREENBAUM HILDA B TRUSTEE OF REVOCABLE I	H	43	32
	STONE RANDALL	H	61	8
	ROSEN JEANNE (JEWELL)	H	103	14
	GREENBAUM HILDA B TRUSTEE	L	17	124
	REHORKA FRANK G	M	15	5
	REHORKA FRANK G	M	16	24
	HANSON DAVID A	Q	18	10
	GRIFFIN JENNY LOUISE	Q	28	6
	CULLEY/DINARDI REAL ESTATE TRUST	Q	68	8
	MARGLIN STEPHEN	Q	73	3
	PEARSON SANDON S.	Q	76	1.8
	PEARSON SANDON S.	R	15	34
	HAYES ROBERT B	S	6	18
	DISE SANDRA K	S	8	14
	COTE NORMAN R	T	47	37
	JACOBY DIANE	T	96	15
	HOUSTON THOMAS F	U	18	3
	HOUSTON THOMAS F	U	45	2
	CONWAY DOLORES M	W	16	3
	CONWAY DOLORES M	W	17	2
	CONWAY DOLORES M	W	18	2
	CONWAY DOLORES M	W	19	0.4
	CONWAY DOLORES M	W	20	42
	DEVINE JOHN E	W	30	11
TOTAL CH. 61 B				457.2
TOTAL CHAPTER 61				6,081.1

Source: Town of Shutesbury Assessors Records; 2003.

Recommendations

- **The Select Board and the Board of Assessors should support the Assessor's Clerk to continue to correct and update the Assessor's Geographic Information System (GIS) parcel information so that accurate maps can be created, which would help the town most effectively implement its natural resource protection and land conservation objectives. Over the past several**

years, town officials and concerned citizens have sought to develop accurate open space maps that identify parcels of land by their degree of protection from development. The main stumbling block to these efforts has been the state of the assessor's information. In particular, the use of 'Z-lots' as a means of clumping parcels under a single ownership and the lack of a hard copy file for recent real estate transactions has made it nearly impossible to accurately depict those lands currently in the Chapter 61 tax abatement programs despite the extensive work of volunteers.

- **Explore working with a professional planner to support the Conservation Commission and Planning Board when a specific need has been identified.** The Planning Board and Conservation Commission are run by volunteers without the assistance of a professional planner. A planner would be able to provide weekly assistance to the town's boards and commissions to more effectively administer existing bylaws, implement short and long-range plans, and ensure that the towns' objectives are met relating to land use, housing, natural resource conservation, economic development, recreation, and municipal services.
- **Determine the feasibility of acquiring town land and/or adopting an aquifer protection overlay district to conserve potential sources of community drinking water supplies in Shutesbury.** According to the Executive Office of Environmental Affairs, there are potential medium yield aquifers in Shutesbury, which could be accessed via a community drinking water supply well. There are three areas in town where a community well might be feasible. All three sites have two things in common: 1) a potential medium yield aquifer below ground; and 2) a lack of constraints to locating a Zone I wellhead protection area as identified by the Department of Environmental Protection. A Zone I wellhead protection area is a circle of land around the well with a radius up to 400 feet (11.54 acres) designed to help protect the well from contamination. The three areas include: The Roaring Brook aquifer north of Leverett Road, which may already be accessed by the Shutesbury Elementary School's wells; the Dudleyville Marsh aquifer; and, the Lake Wyola/Ames Pond aquifer. Shutesbury could identify a future well site through pumping tests and surficial geology studies and if successful, acquire the fee interest of the Zone I wellhead protection area. The town may also determine that an aquifer protection overlay (APO) district would be more appropriate, though this would likely require additional pump tests to determine the extent of a well's recharge area, the most compelling boundary for such a district. An APO district would be designed to regulate land uses to reduce the risk of groundwater contamination.
- **The Board of Health should continue to map the locations of private wells in relation to road right-of-ways, leach fields, and other potential sources of**

water contamination as a means of drawing attention to the relative vulnerability of our private wells to pollutants. Groundwater is the source of drinking water for every resident in town. Typically, wells are drilled a safe distance from septic system leach fields. However, there are other types of pollutants that can contaminate private wells including petroleum products, pesticides, animal feces, and road salt. By mapping private wells using GPS and the town's GIS maps, town officials may be able to encourage a town-wide dialogue on private well water protection, the best ways of using and disposing of household hazardous wastes including gasoline and motor oil, and on regulating the town's use of road salt and deicing materials to reduce potential impacts on well water quality.

- **Encourage the Shutesbury Conservation Commission to work in cooperation with the Board of Health to ensure that rivers, streams, lakes and ponds not under the direct authority of the Amherst Public Works Department and the Department of Conservation and Recreation (Division of Water Supply Protection) are monitored for water quality.** The town could work in cooperation with the Town of Leverett and the Natural Resources Conservation Service (NRCS) to monitor rivers and streams in the Roaring Brook and Sawmill River sub-watersheds.

- **Support the Conservation Commission to continue to proactively negotiate land protection in Shutesbury and to use the publicity of projects to promote and build the Conservation Trust Fund.** Town officials have successfully protected conservation lands in Shutesbury using different methods from working in partnership with state agencies to raising funds with private donations. Often people are more apt to donate money to protect land when development is a real and impending threat. However, the ability of the town to implement its conservation objectives is maximized if funding is already available to leverage land protection deals in a timely manner. It is therefore important for officials and concerned residents to work together to increase funds available for land protection in advance of need.

- **The Recreation and Open Space Committee should continue to apply identified criteria/priorities of open space acquisition to opportunities that may arise, especially via the Chapter 61 right-of-first-refusal, so as to provide the town a rating of the parcel's relative desirability of protection.** These include:
 1. Open fields and non-forested lands;
 2. Important water features including falls, springs, and distinctive or unique wetlands;
 3. Rare species habitat (state-listed rare, threatened and endangered) and vernal pools;

4. Areas of high visual or aesthetic value;
 5. Recreational access and lake, stream and trail node access;
 6. Unique or distinctive historic, archaeological or geological features;
 7. Threat of development; and
 8. Areas that connect or enlarge protected areas and or create conservation corridors.
- **The Recreation and Open Space Committee should encourage private efforts and investment in land protection, especially when the land in question can be characterized as meeting the open space acquisition criteria listed above.** Most residents favor land protection efforts in town. According to the 2000 Town Survey, 93 percent of respondents said they *strongly supported* or *supported* acceptance of gifts to the town of conservation land and 83 percent *strongly supported* or *supported* the town purchase of conservation land. Two methods that might increase interest in land and conservation restriction donations include celebrating existing town conservation lands and educating the general public through the town web site and the Our Town newsletter on land conservation and estate planning methods, practices, and case studies. Landowners may be more apt to donate land to the town if they have confidence that the gift will be appreciated and well used. Often, case studies can be a powerful method for clearly showing the financial benefits of land protection for private landowners.
 - **The Planning Board, in collaboration with the Conservation Commission, Recreation and Open Space Committee and the Board of Health, should establish a rural conservation overlay district for critical resource areas, which would have conservation development design as the preferred development option.** Utilize updated existing GIS information, the 2000 Town Survey results, the town's land acquisition criteria, and the Land Use Suitability Map (*to be created for the Land Use & Zoning Chapter of the Master Plan*) to identify the areas of town containing the greatest concentration of critical natural and recreational resources the values of which would be most greatly impacted by traditional subdivision design.
 - **The Shutesbury Recreation and Open Space Committee should continue to plan, develop, and maintain trail linkages over land and water to enhance the recreational experiences of residents.** The Committee could organize a task force of stakeholders representing diverse user groups to reach consensus on trail use and promotion throughout town.
 - **The Shutesbury Recreation and Open Space Committee should continue to provide information on Chapter 61, conservation restrictions, and other land protection methods to all landowners especially those with parcels in critical resource areas (see the Land Use Suitability Map in the Housing Chapter).** The Town Survey demonstrated a strong interest among residents in land protection.

Town officials should work together to develop and fund effective means for communicating information to the people who can use it most, landowners interested in protecting their forests and fields in perpetuity.

- **The Shutesbury Recreation and Open Space Committee should continue to promote open fields for scenic and wildlife habitat purposes through educational offerings to landowners and residents.** The Committee could offer educational materials through the Our Town Newsletter concerning methods and sources of assistance for the protection, enhancement, and management of open fields.

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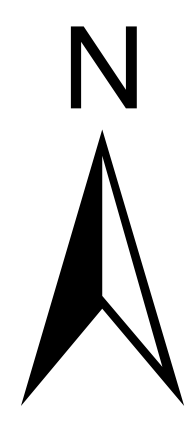
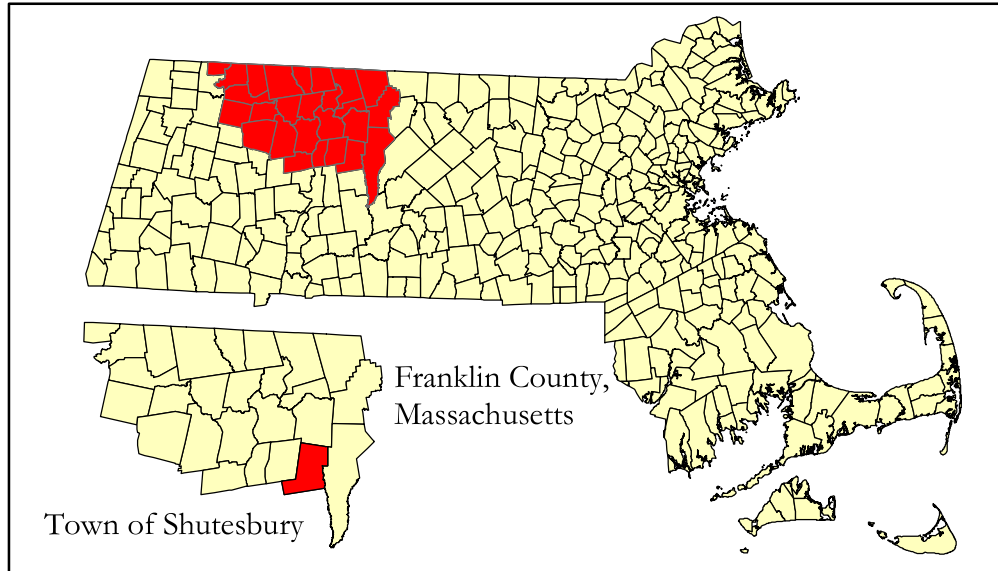
Town of Shutesbury

Master Plan

Topography



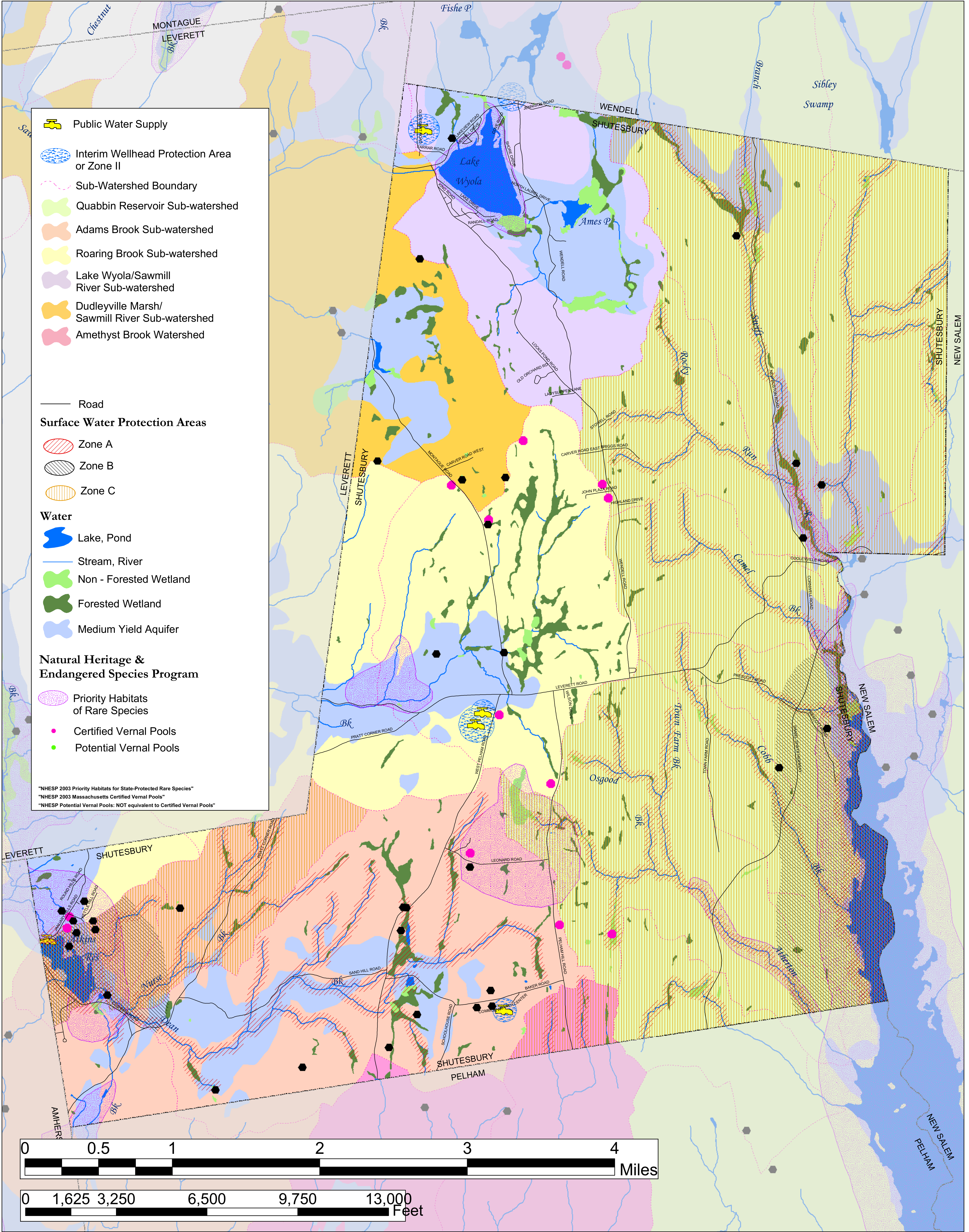
FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS
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 425 Main Street
 Greenfield, Massachusetts 01301



Map Sources:
 Map Produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, the Massachusetts Highway Department and MassGIS. Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. EOGA maintains an ongoing program to record and correct errors in the GIS data that are brought to or as to the implied validity of any uses of the GIS data. EOGA maintains records regarding all methods used to collect and process these digitized data and will provide this information on request. Executive Office of Environmental Affairs, MassGIS Data Center, 20 Somerset Street, 3rd Floor, Boston, MA 02127-0227.
 Note: Depicted boundaries are approximate and are intended for planning purposes only.
 Roads data provided by Massachusetts Highway Department, Town Lines, rail lines, streams, and lakes data provided by MassGIS. Contour lines provided by USGS and MassGIS. Relief created through TIN process using 3 meter contour elevation points provided by MassGIS.

Town of Shutesbury Master Plan

Water Resources and Wildlife Habitat



Public Water Supply

Interim Wellhead Protection Area or Zone II

Sub-Watershed Boundary

Quabbin Reservoir Sub-watershed

Adams Brook Sub-watershed

Roaring Brook Sub-watershed

Lake Wyola/Sawmill River Sub-watershed

Dudleyville Marsh/Sawmill River Sub-watershed

Amethyst Brook Watershed

Road

Surface Water Protection Areas

Zone A

Zone B

Zone C

Water

Lake, Pond

Stream, River

Non - Forested Wetland

Forested Wetland

Medium Yield Aquifer

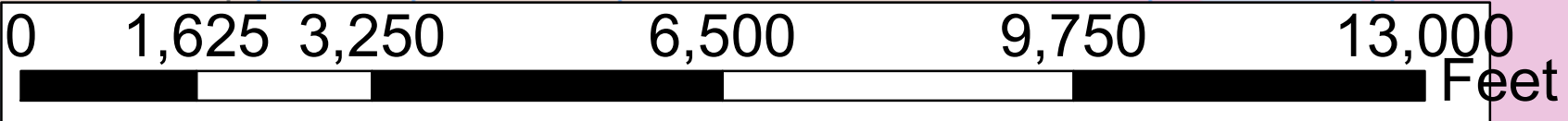
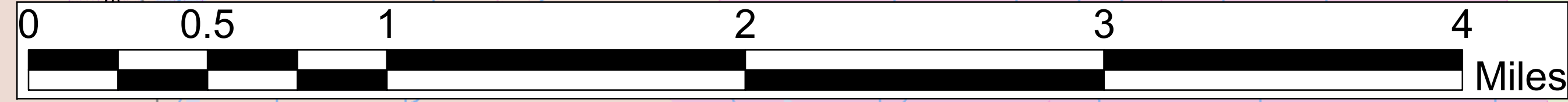
Natural Heritage & Endangered Species Program

Priority Habitats of Rare Species

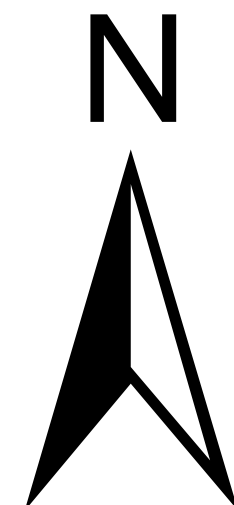
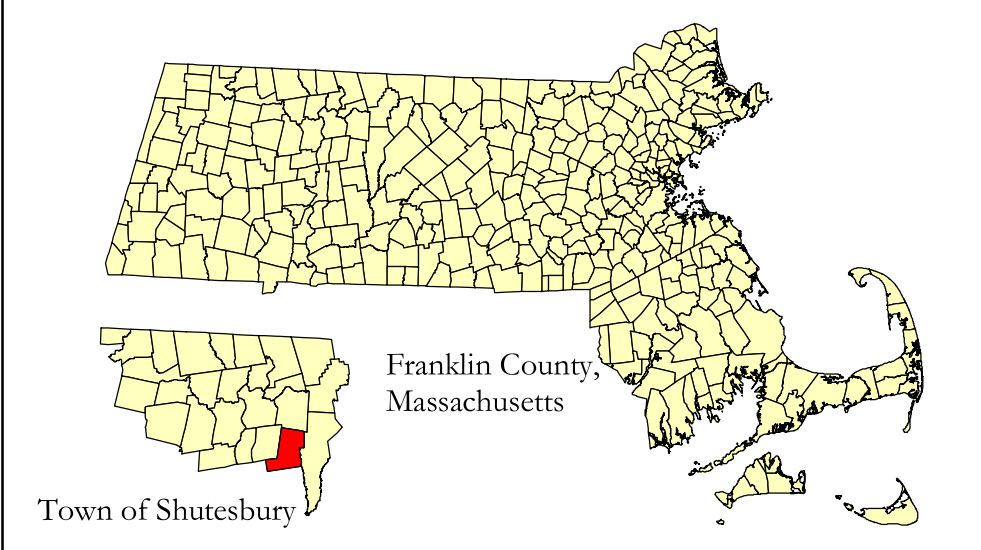
Certified Vernal Pools

Potential Vernal Pools

NHESP 2003 Priority Habitats for State-Protected Rare Species
NHESP 2003 Massachusetts Certified Vernal Pools
NHESP Potential Vernal Pools: NOT equivalent to Certified Vernal Pools



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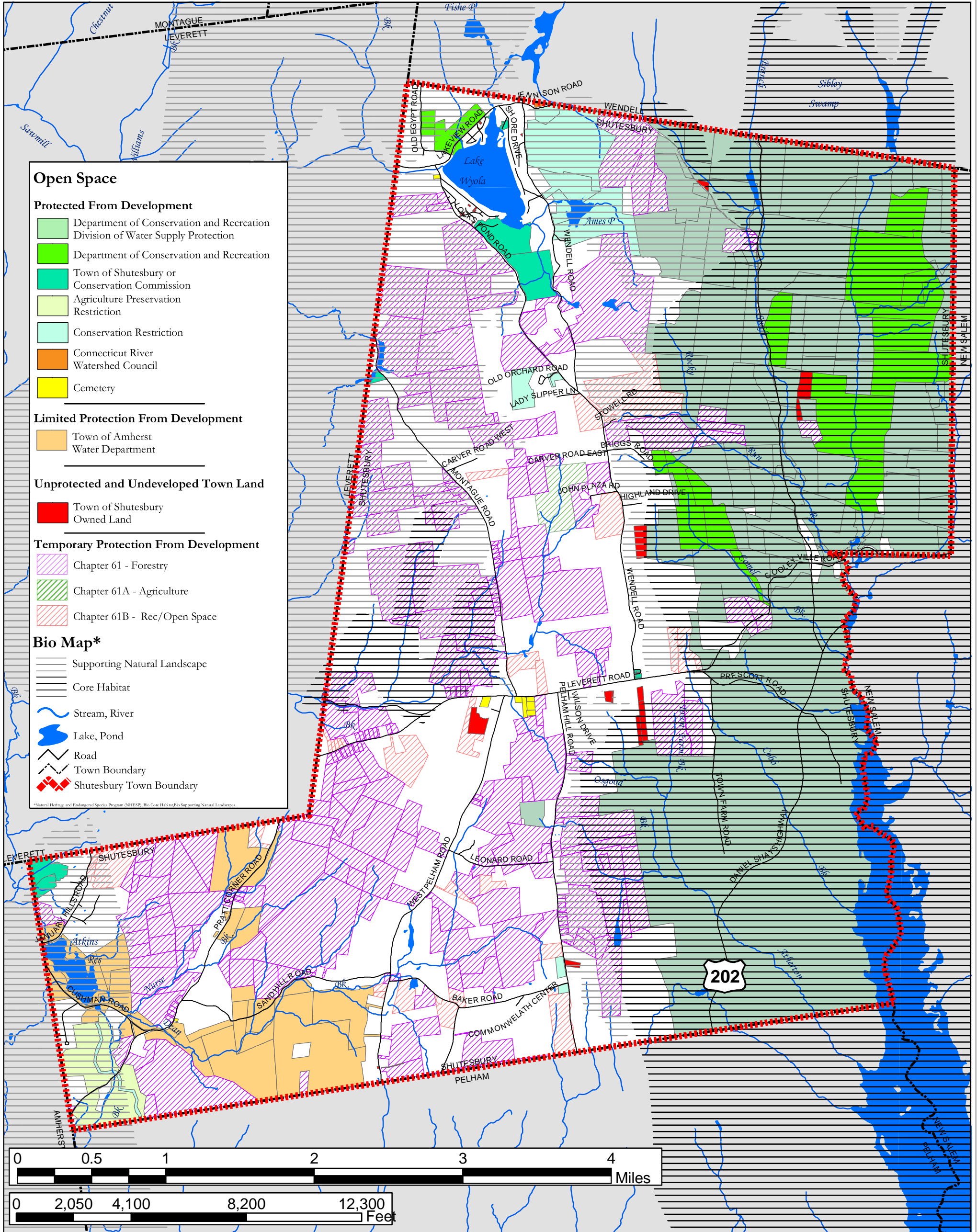
Map Sources
 Map Produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include the Massachusetts Highway Department and MassGIS. Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. ECEA maintains an ongoing program to record and correct errors in the GIS data that are brought to or as to the widest variety of any uses of the GIS data. ECEA maintains records regarding all methods used to collect and process these digitized data and will provide this information on request. Executive Office of Environmental Affairs, MassGIS ECEA Data Center, 251 Causeway St., Suite 100, Boston, MA 02114-1000.
 Note: Dotted boundaries are approximate and are intended for planning purposes only.

Road data provided by Massachusetts Highway Department Inventory 2002 and MassGIS; Town Lines, streams, lakes, Zone II, Interim Wellhead Protection Area, and Public Water Supply data provided by MassGIS; Wetlands are provided by MassGIS; DEP 1:5000 orthophoto depiction.

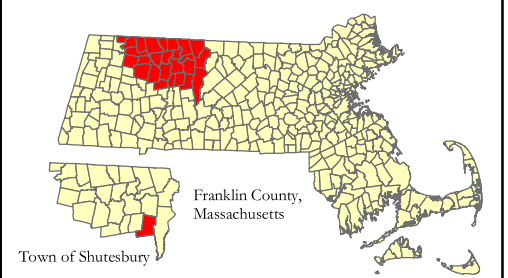
Note: Dotted boundaries are approximate and intended for planning uses only. Accuracy of the work is +/-100 feet.

Town of Shutesbury Master Plan

Open Space & NHESP BioMap Core Habitat and Supporting Natural Landscape



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10 Acres
100 Acres



Map Sources

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Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. EOEAA maintains an ongoing program to record and correct errors in the GIS data that are brought to us as to the implied validity of any uses of the GIS data. EOEAA maintains records regarding all methods used to collect and process these digital data and will provide this information on request. Executive Office of Environmental Affairs, MassGIS EOEAA Data Center, 26 Somerset Street, 3rd Floor, Boston, MA, 617-727-6227.

Note: Depicted boundaries are approximate and are intended for planning purposes only.

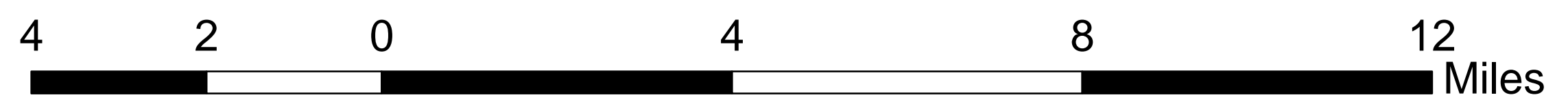
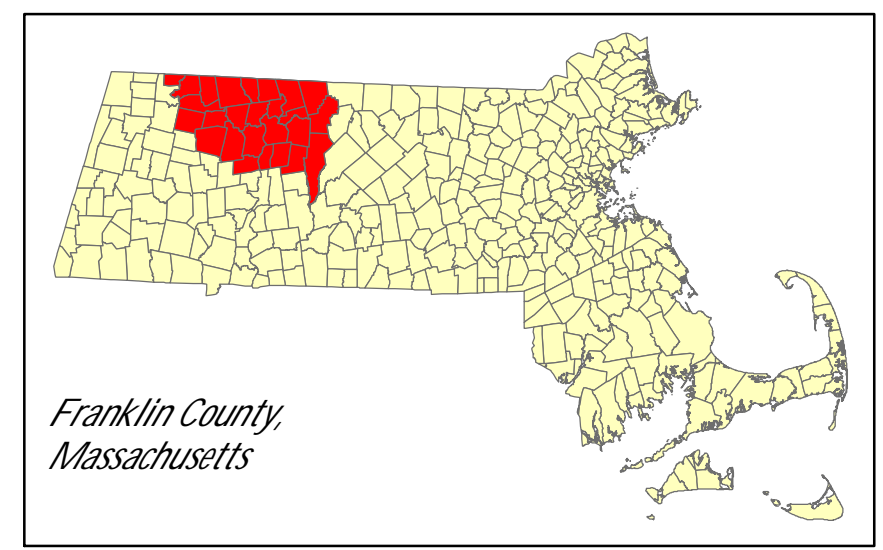
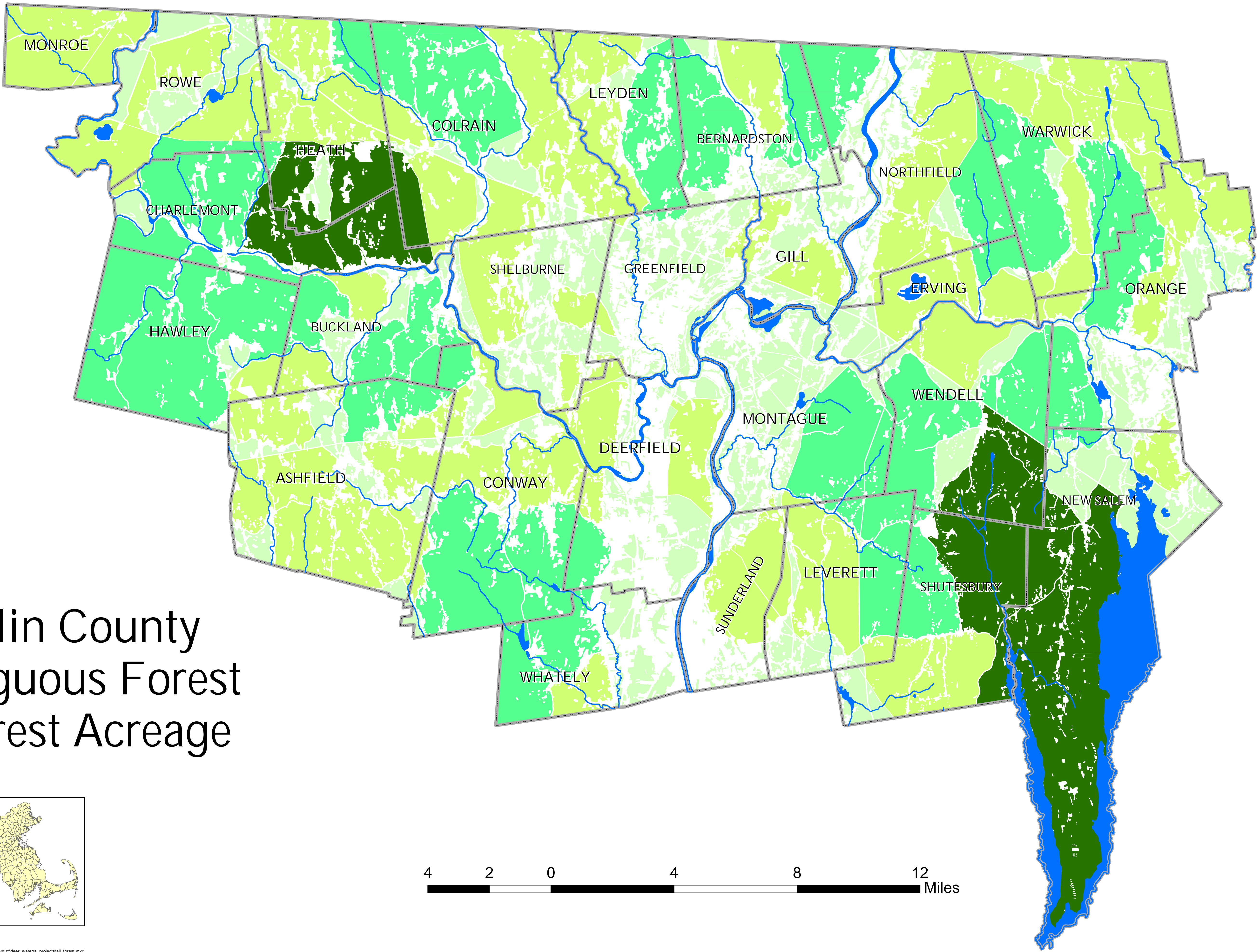
Roads data provided by Massachusetts Highway Department and MassGIS 1:5000. Town Lines, streams and lakes data provided by MassGIS.

Open space parcel data provided by the Town of Shutesbury.

*NHESP BioMap Core Habitat

*NHESP BioMap Supporting Natural Landscape

Franklin County Contiguous Forest by Forest Acreage



map sources:
Forest data provided by MassGIS and
Franklin Regional Council of Governments
Planning Department. Roads have been
buffered to 100 ft and then erased from
the contiguous forest coverage. The original
roads coverage was provided by Mass hwy.
department road inventory file 2002. Original
land use coverage provided by MassGIS, 1999.

Identification of Potential Water Supply Areas for Franklin County:

A Composite of Constraints to Potential Zone I Wellhead Protection Areas

Map Sources

Map Produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, the Massachusetts Highway Department and MassGIS. Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. EOEa maintains an ongoing program to record and correct errors in the GIS data that are brought to or as to the implied validity of any uses of the GIS data. EOEa maintains records regarding all methods used to collect and process these digital data and will provide this information on request. Executive Office of Environmental Affairs, MassGIS EOEa Data Center, 251 Causeway St., Suite 900, Boston, MA, 617-626-1000. Note: Depicted boundaries are approximate and are intended for planning purposes only.

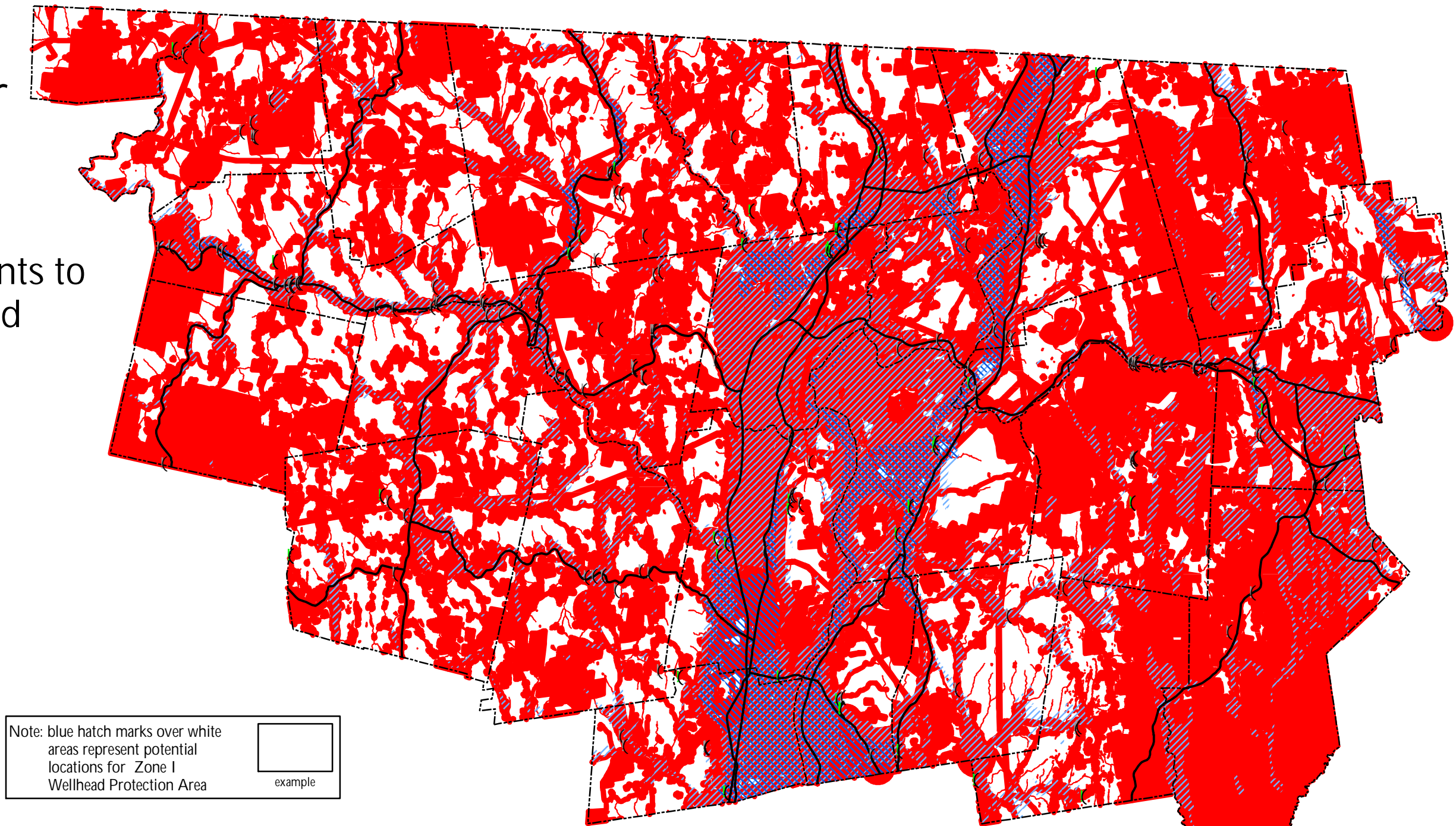
The criteria used in this map are a result of data manipulation by the Franklin Regional Council of Government's Planning Department. Data involved in the criteria include all surface water, established 21E sites, 1999 Land use, protected open space, all provided by MassGIS.

Town Lines, aquifer and well data provided by MassGIS. Aquifer data also provided in part by USGS. Note: Depicted boundaries are approximate and intended for planning uses only. Accuracy of line work is +/-100 feet.

The USGS 1:48,000 hydrologic atlas series on groundwater favorability was produced for all of Massachusetts. The basemaps for these were photographically reduced and spliced together from 1:24,000 USGS quadrangles. Each manuscript covers one of the major drainage basins. They have been individually researched and published by the USGS-WRD starting in the 1960's and continuing to the present. Several have been compiled but not yet published. In these cases the draft manuscripts were automated. The definition of high and medium yield varies between panels, as it does on the source manuscripts. While the medium yield for most basins is between 100 and 300 gpm (gallons per minute), this range may vary greatly from basin to basin. High yield definitions vary from basin to basin as well. Yield for each panel is found in the metadata file AQ.SRC.

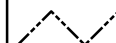








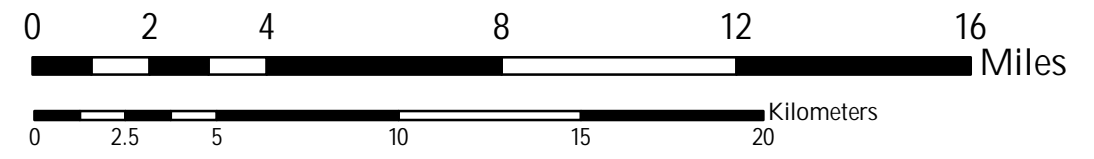
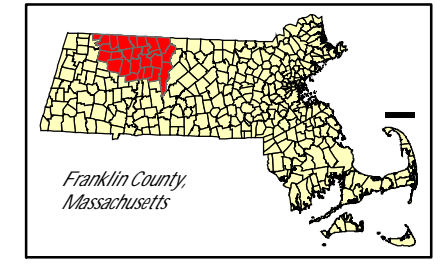
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Note: blue hatch marks over white areas represent potential locations for Zone I Wellhead Protection Area

example

	Town Boundary		Area restricted from inclusion in Potential Zone I Wellhead Protection areas based on the selected criteria.
	Major Road		Community Water Supplies Included in Water Supply Study
	Potential Zone I Wellhead Protection Area above Potential High Yield Aquifer		Other Public Water Supply
	Potential Zone I Wellhead Protection Area above Potential Low-Medium Aquifer		



CHAPTER 2

ECONOMIC DEVELOPMENT

One description of local economic development planning describes a process that gives an area “a greater capacity to contribute to determining its own economic destiny¹.” The path a community takes toward its “economic destiny” is best guided by the residents’ vision for their hometown. Through the 2001 Town Plan Survey process, an economic development goal with corresponding objectives was established to help guide this path. The goal and objectives have two general themes: residents of Shutesbury have a strong desire to maintain the community’s rural character; and there is a need to generate revenue for the municipality, so that community resources and services may be continued and enhanced without increasing residential property tax rates.

Using the survey results for an understanding of the overall landscape and resources of a town, selected strategies may be implemented to advance a community’s wealth and well-being. For more populated communities, large-scale industrial development may be a strategy. For more rural communities, such as Shutesbury, strategies to encourage low impact commercial development (such as bed & breakfast establishments or a general store), to promote small-scale production enterprises (such as farming and forestry operations, or manufacturers with five or less employees) or to support home-based, cottage industries (such as artists and independent entrepreneurs) are more effective efforts. However, to make any of these strategies successful, a coordination of efforts must be in place regarding work force, business location, adequate infrastructure, and access to financing. All of these elements must be in careful balance to encourage new business development while maintaining community character.

In 2001, residents and landowners of Shutesbury received a Town Plan Survey that addressed several subjects, including economic development. Nearly 26 percent of the 1,275 surveys mailed were returned. Using survey responses and the input from Town boards and committees, the following goal and objectives for economic development were created by the Town Plan Committee.

Goal:

- To explore and potentially promote small home business and commercial uses including arts and crafts, bed & breakfasts, professional offices and services, retail, forest/farm-based operations and light industrial development compatible with the Town’s environment and rural character that will provide new employment opportunities and contribute tax revenues.

¹ Blakely, Edward J. (1994). Planning Local Economic Development: Theory and Practice, 2nd Edition, Thousand Oaks, CA: Sage Publications Inc.

Objectives:

- Encourage, through zoning, the development of local businesses which can be integrated into the community without adverse environmental impacts including forestry, specialty food products, aquaculture, nurseries, home based businesses, a coffee shop/eatery, artisans, and professional offices.
- Explore the feasibility of locating light industrial development and associated infrastructure including wastewater treatment in a suitable location and determine if the current zoning is compatible with the protection of environmental and scenic resources.
- Participate with regional efforts like Franklin-Hampshire Connect to help ensure Shutesbury residents and small business owners can have access to high-speed Internet connections.
- Explore the feasibility and desirability of working with a developer of retirement communities to establish a privately owned facility in Shutesbury as a means of generating real estate tax revenues.

Demographics

A review of the general demographic profiles of residents is useful in developing specific economic development strategies. The size and characteristics of the existing and prospective labor pool identifies to business developers the type of workers to which they may have access. The profile of workers may also direct the type of employment opportunities that could be sustained in the community and that would offer the greatest benefit to those in need of jobs. For example, the relative income of Shutesbury residents is reviewed to give a sense of the present wages offered and a direction for the types of jobs and wages needed to support residents looking for jobs. In addition, this demographic data may be used to guide entrepreneurs in the creation of their business plans, so as to best draw Shutesbury residents as a customer base.

Population

In 2000, the U.S. Census Bureau reported that Shutesbury had a population of 1,810 people (Table 2-1). While this is considered a small town by metropolitan standards, it is slightly larger than some of its neighbors: Leverett (1,663), New Salem (929), and Pelham (1,403). Amherst to the south is a major employment and shopping center and had a population of 34,874 in 2000.

Table 2-1: Total Population from 1970, 1980, 1990 and 2000

Geography	1970 Population	1980 Population	1990 Population *	2000 Population
Shutesbury	489	1,049	1,561	1,810
Franklin County	59,223	64,317	70,092	71,535
Massachusetts	5,689,377	5,737,037	6,016,425	6,349,097

Source: U.S. Census Bureau – 1970 Census, 1980 Census, 1990 Census, and 2000 Census

* Please note that there is a discrepancy between the Town Census population figure and the U.S. Census Bureau 1990 population figure. Town officials have noted that U.S. Census Bureau 1990 population is lower than the Town Census population.

The population change in Shutesbury in recent decades has been remarkable. From 1970 to 2000, the population in the Town of Shutesbury grew 270 percent (Table 2-2), with a net gain of 1,321. During this time frame, the greatest increase in population occurred from 1970 to 1980 with 114.5 percent growth. Since that time, the rate of population growth has diminished but still remains sizeable. For Franklin County, the rate of population growth was fairly consistent from 1970 to 1980 and 1980 to 1990 with 8.6 percent and 9.0 percent growth rates respectively. However, the growth rate from 1990 to 2000 in Franklin County diminished to 2.1 percent. In contrast to these trends, the State did not grow as much since 1970 (11.6%). However, the rate of growth continued to rise each decade.

Table 2-2: Population Change from 1970 to 2000

Geography	1970-1980 Change	1980-1990 Change	1990-2000 Change	1970-2000 Change
Shutesbury	114.5%	48.8%	16.0%	270.1%
Franklin County	8.6%	9.0%	2.1%	20.8%
Massachusetts	0.8%	4.9%	5.5%	11.6%

Source: U.S. Census Bureau – 1970 Census, 1980 Census, 1990 Census and 2000 Census

Age Distribution

It is important to know the size of various population age groups and how they are changing over time. The rise and fall in the number of people in different age groups (called cohorts) can affect demand for various municipal services, including schools and housing. It can also impact the number of people in the labor pool available to local businesses.

U.S. Census Bureau age distribution data is used to predict how the labor force may change over time. The Town of Shutesbury and Franklin County share some similar age distribution patterns. From 1990 to 2000, there were decreases in the number of children under 9 years of age, while the number of young adults from 10 to 19 years of age increased (Table 2-3). In Shutesbury, the increase in this age group of 10 to 19 year olds was much greater than the County and State increases, respectively, 87.4 percent, 16.3 percent and 11.9 percent. In contrast, the State experienced a moderate increase in the number of children under 9 years of age (4.9%), and an increase in young adults aged 10 to 19 (11.9%).

Table 2-3: Age Distribution in 1990 and 2000

Geography	9 Years & Under	10 - 19 Years	20 - 24 Years	25 - 44 Years	45 - 64 Years	65 - 74 Years	75 Years & Over
Shutesbury							
1990	297	175	78	718	200	55	39
2000	223	328	73	524	558	61	43
% Change	-24.9%	87.4%	-6.4%	-27.0%	179.0%	10.9%	10.3%
Franklin County							
1990	10,196	8,819	4,518	23,959	12,429	5,741	4,430
2000	8,247	10,255	3,897	20,406	18,550	4,781	5,399
% Change	-19.1%	16.3%	-13.7%	-14.8%	49.2%	-16.7%	21.9%
Massachusetts							
1990	789,195	756,968	508,039	2,021,191	1,121,105	464,131	355,796
2000	828,129	846,984	404,279	1,989,783	1,419,760	427,830	432,332
% Change	4.9%	11.9%	-20.4%	-1.6%	26.6%	-7.8%	21.5%

Source: U.S. Census Bureau – 1990 Census STF3A and 2000 Census SF3

For the age group from 20 to 24 years old, there have been consistent decreases in the number of these individuals in each region: -6.4 percent in Shutesbury, -13.7 percent in Franklin County, and -20.4 percent in Massachusetts. This is in accordance with national population trends.² However, specifically in the Town of Shutesbury, this slight loss of 20 to 24 year-olds may be a result of young adults leaving the Town to attend college or to search for job opportunities elsewhere. Another explanation could be related to Shutesbury’s close proximity to the University of Massachusetts. A decline in rental housing for traditional college age students may account for some of the population loss in this age group.

Traditional work force age groups are the 25 to 44 age range and the 45 to 64 age range. Each of these age groups is likely to have a greater interest in specific amenities and services that will influence their desire to remain in or move to the Town of Shutesbury. The 25 to 44 year olds are more likely to be examining a community’s real estate options and daycare and early educational systems for their children. Whereas the age group from 45 to 64 years of age will more likely be considering educational opportunities for their older children and future retirement options.

In Shutesbury, there was a considerable decrease in the number of people in the 25 to 44 year age group, while a dramatic increase in the number 45 to 64 year olds, often referred to as the “Baby Boom” generation. The influx of this Baby Boom generation with their children is likely part of the 22 percent increase in the number of families in Shutesbury from 1990 to 2000.

From 1990 to 2000, the 65 to 74 year age group and the 75 year plus age group have both increased by a small number of individuals. This age group may have an increasing role in

² A note regarding national population trends: From 1946 to 1966, there was a dramatic population increase, referred to as the “Baby Boom”. A corresponding smaller population boom occurred in the 1980s and 1990s when the Baby Boomers had their own children. This is the population group presently under 20 years of age, and are often referred to as “Generation Y”. The children born in the late 1960s and the 1970s are often referred to as “Generation X”. This is a smaller age group in comparison and are presently in the age range from 20 to 40 years of age.

the work force than in previous decades. Postponement of retirement for financial or career reasons is increasing. Often members of this age group can be a valuable resource of experienced, part-time workers.

As the Baby Boom generation reaches retirement age, job vacancies will occur. However, they may also be apt to postpone retirement by reducing their hours or start in a new direction, such as consulting or a complete career shift into a new occupation. As will be discussed further in this chapter, Shutesbury has many self-employed workers. These individuals that postpone retirement may contribute to this trend.

Whether or not retiring residents would continue to reside in Shutesbury could impact the demand for elder services. Older residents with grown children may be tempted to move to a community with lower residential property taxes. This would create a supply for housing, which could be filled by young families with children that would result in higher education costs. Due to these potential outcomes, providing support to seniors makes economic sense.

Education and Skills

The educational attainment level of the population is important to recognize for several reasons. From a business owner's perspective, it demonstrates the ability of a community to provide labor and expertise. This may be a vital element in a company's decision to locate to or remain in a community. In addition, the educational attainment level of a population, may be a factor for a business determining where to locate, so as to best access a potential customer base.

According to 1990 and 2000 Census data, Shutesbury has a significantly higher proportion of residents with a bachelor's degree or graduate/professional degree, than the County or the State (Table 2-4). Correspondingly, Shutesbury has a lower proportion of residents that have a high school diploma or less.

Interestingly, from 1990 to 2000, there was a noteworthy increase in the percent of Shutesbury residents with graduate degrees. The high proportion of residents with Graduate Degrees may be related to the Town's proximity to the University of Massachusetts (UMASS) and the other colleges located in the area. The Franklin County towns with the highest percentage of Graduate Degrees in 2000 are all located adjacent to Amherst: Leverett (43.3%), Shutesbury (38.1%) and Sunderland (23.2%).

Table 2-4: Highest Educational Attainment Level in 1990 and 2000 *

Geography	Population 25 years and over	% Less than High School Graduate	% High School Graduate	% Some College	% Associate Degree	% Bachelor Degree	% Graduate Degree
Shutesbury							
1990	1,012	6.4%	15.7%	14.3%	5.3%	29.8%	28.4%
2000	1,184	2.5%	14.7%	14.2%	5.9%	24.6%	38.1%
Franklin County							
1990	46,559	17.6%	33.2%	16.9%	8.0%	14.5%	9.8%
2000	49,121	12.0%	31.2%	19.0%	8.6%	16.2%	12.9%
Massachusetts							
1990	3,962,223	20.0%	29.7%	15.8%	7.2%	16.6%	10.6%
2000	4,273,275	15.2%	27.3%	17.1%	7.2%	19.5%	13.7%

* All data is for persons 25 years and over.

Source: U.S. Census Bureau – 1990 Census STF3A and 2000 Census SF3

The Massachusetts Department of Education releases selected statistical data regarding public schools in the state, such as drop-out rates and plans of seniors. Public high school students in Shutesbury attend the Amherst-Pelham Regional School District, which also serves students from Amherst, Leverett, and Pelham. This district has among the lowest drop-out rates and highest college intention rates in the region. Table 2-5 shows a selection of data for this and other school districts in the region located near Shutesbury.

Table 2-5: Selected School District Data 2000

School District (Location)	Number of Students in District	Drop-out Rate	Graduate Plans for 4-Year College	Average Annual Per Pupil Expenditure	Students per Computer	Computers Connected to the Internet
Amherst-Pelham Regional School District (Amherst)	2,047	1.7%	76.3%	\$8,102	4.9	100.0%
Franklin County Vocational Technical School (Turners Falls)	490	3.7%	1.1%	\$14,164	2.3	100.0%
Frontier Regional School District (Deerfield)	661	1.7%	55.1%	\$8,022	1.9	100.0%
Gill-Montague Regional School District (Turners Falls)	1,540	5.7%	33.3%	\$7,412	6	100.0%
Greenfield Public School (Greenfield)	2,433	4.1%	48.2%	\$6,817	10.4	80.0%
Ralph C. Mahar Regional School District (Orange)	764	5.9%	42.3%	\$8,203	6.2	94.0%
Massachusetts Average	-	3.5%	53.6%	\$7,149	5.7	77.0%

Source: Massachusetts Department of Education – 2001 School District Profiles; October 2002

According to the Massachusetts Department of Education, a survey of high school seniors in 2000 was conducted to determine their plans upon graduation. For students at the Amherst-Pelham Regional School District, the survey indicated that 76.3 percent planned to attend a four-year college, which is much higher than the statewide average of 53.6 percent. The 15.1 percent of Amherst-Pelham Regional School District students that planned to attend a two-year college is less than the statewide average of 20.6 percent. The percent of local students entering the military or the workforce was also less than the Statewide average, 0 percent and 5.8 percent respectively, compared to 2.5 percent and 15.0 percent respectively across the

State. The remaining 2.7 percent of local students had no specified plans. Statewide, 2.3 percent of students had no specified plans, and for the remaining 2.7 percent of students, no data were available regarding their plans.

Income

There are three statistics from the decennial Census that reflect how well residents are benefiting from the local economy by describing the incomes of residents. Using these statistics, it may be noted that the residents in the Town of Shutesbury are earning higher incomes than residents in the County or State overall. One such measure is per capita income, which is determined by dividing the total amount of income earned in Town by the number of residents (including a portion of the population that might not be generating income such as children and the elderly). Per capita income is often used as a relative measure for comparative purposes. The Shutesbury per capita income reported for 1999 was \$26,260, which was higher than both the County figure of \$20,672, and State figure of \$25,952, and was among the highest of the twenty-six towns in Franklin County (Table 2-6).

Median household income is a better statistic for describing the distribution of income. Median income figures describe the middle statistic in a data set, which is unaffected by any extreme numbers (either the very wealthy or very poor) from influencing the overall figure. This data relates information about families as well as individuals living alone. The median household income for Shutesbury is \$60,437 in 1999, which is higher than the County (\$40,768) and the State (\$50,502) figures. In fact, the Shutesbury median household income in 1999 was the second highest in the twenty-six towns in Franklin County, below only neighboring Leverett (\$73,333).

Table 2-6: Selected 2000 Income and Poverty Statistics

Geography	Per Capita Income in 1999	Median Household Income in 1999	Individuals Below Poverty Level*
Shutesbury	\$26,260	\$60,437	3.8%
Franklin County	\$20,672	\$40,768	9.4%
Massachusetts	\$25,952	\$50,502	9.3%

* For whom poverty status was determined.

Please note that income data was reported for the previous year, in this case 1999, of when the Census survey was taken.

Source: U.S. Census Bureau – 2000 Census SF3

Poverty level data provide another way to describe a community’s income and economy. Poverty status is established using federal income thresholds that vary according to family size and composition. Individuals are then determined to have income levels above or below these thresholds. In Shutesbury, 3.8 percent of residents, for whom poverty status was determined (for Shutesbury 99% of the population was included in the sample), were living below the poverty level in 2000. This was significantly less than in the County (9.4%) and State (9.3%).

Labor Force Characteristics and the Local Economy

The following is a discussion of the quantity of labor available in the regional labor force. In this section, data will be given for the Town of Shutesbury, Franklin County and Massachusetts, as well as neighboring Hampshire County because of the close economic ties between Shutesbury and employers in Hampshire County. Commuting data is used to identify the boundaries of the regional labor pool, which will likely influence the potential for business growth in Shutesbury. Additional tables with data for the Towns of Amherst, Leverett, New Salem, Pelham, and Wendell are included in Appendix C for reference.

Data for this section come from two different sources, one federal and one state. The federal source is decennial Census data. Data from these surveys offer a snapshot in time of the employment status and characteristics of the labor force. This data may be compared to previous decennial census surveys. However, data available on an annual basis may be of greater value for identifying trends. State data from the Massachusetts Division of Employment and Training (DET) are available on an annual basis for the number of total employment and for unemployment rates. This information will be used to determine the employment patterns occurring in the Town of Shutesbury.

Commuting and the Regional Labor Force

Commuting pattern data of the regional labor force are used to garner an understanding of where Shutesbury residents work and where residents from neighboring communities work as well. If Shutesbury is to pursue a strategy of business development, a source of potential labor within and outside of the community must be identified.

Commuting pattern data from the decennial Census are determined for basic geographic boundaries (town, county and state). Table 2-7 shows that the percentage of workers who work in their town of residence has increased in Shutesbury from 1990 to 2000; whereas in the neighboring towns of Amherst, Wendell and New Salem, and in the Counties and State, there has been a greater trend for resident workers to be employed outside the town of residence. Shutesbury has also shown an increase in the number of residents who do not work in Town but work in Franklin County, and a corresponding decrease in the number of residents who work outside of Franklin County. The decline in the number of residents working in their town of residence, as experienced in Wendell, New Salem, and Franklin County and State overall, demonstrates the general increase in commuting behavior of residents.

The University of Massachusetts, as well as other educational institutions and businesses in the Town of Amherst, constitute a major regional employment center. This is assumed to be the reason why such a high percentage of Shutesbury workers commute out of Franklin County.

Table 2-7: Worker Commute Patterns 1990 and 2000

Geography	Total Workers*	Worked in Town of Residence	Worked out of Town but in County of Residence	Worked out of County but in State of Residence	Worked out of State of Residence
Shutesbury					
1990	824	12.3%	14.6%	71.2%	1.9%
2000	1,047	14.9%	18.3%	65.1%	1.6%
Franklin County					
1990	34,674	35.8%	35.8%	24.9%	3.4%
2000	37,053	27.6%	34.9%	33.4%	4.1%
Hampshire County					
1990	75,478	43.8%	22.8%	30.9%	2.5%
2000	81,424	37.8%	25.7%	33.1%	3.4%
Massachusetts					
1990	2,979,594	36.5%	35.9%	24.5%	3.1%
2000	3,102,837	31.3%	35.4%	30.1%	3.3%

* Employed workers 16 years and over.

Source: U.S. Census Bureau – 1990 Census STF3A and 2000 Census SF3

The decennial Census also provides statistics on the number of workers who work at home and, the commuting time for those who do not. In Shutesbury and the neighboring towns, the percentage of workers who work at home has increased since 1990 (Table 2-8 and Appendix C Table 2-8). This is a common trend occurring in Franklin County and the State overall. This trend of increasing telecommuting or establishing of home-based businesses could continue and expand if broadband telecommunications services were available.

Between 1990 and 2000, there has been an increase in the percent of Shutesbury commuters whose travel time is less than 10 minutes, 30-39 minutes or 90 minutes or more, to get to work. The increase of travel time greater than half an hour experienced by Shutesbury commuters is consistent with trends for Franklin County, Hampshire County, and the State. As for the increase in Shutesbury workers commuting less than 10 minutes, this trend is not consistent with patterns for Franklin County, Hampshire County, and the State, nor is it common for most small communities. This could be a result of the increased number of workers who work in Town as well as the close proximity to Amherst from the southern area of Shutesbury.

This close proximity to the major employment center of Amherst also provides a reciprocal opportunity for Shutesbury businesses to access this labor pool. In addition, the large college student population in Amherst offers a great resource of labor depending upon the needs of the employer.

Table 2-8: Travel Time to Work in 1990 and 2000

Geography	Total Workers*	Work at home	Less than 10 Min.	10 - 19 Min.	20 - 29 Min.	30 - 39 Min.	40 - 59 Min.	60 - 89 Min.	90 or More Min.
Shutesbury									
1990	824	6.2%	4.0%	24.3%	31.3%	16.0%	11.2%	5.2%	1.8%
2000	1,047	9.0%	5.0%	21.5%	25.8%	20.2%	11.1%	4.3%	3.2%
Franklin County									
1990	34,674	4.7%	21.8%	32.1%	17.8%	11.5%	7.7%	3.2%	1.1%
2000	37,053	5.1%	16.3%	30.0%	19.1%	14.2%	9.7%	3.3%	2.3%
Hampshire County									
1990	75,478	3.5%	23.6%	32.9%	18.2%	12.7%	6.4%	2.1%	0.7%
2000	81,424	4.1%	19.5%	29.7%	19.8%	14.1%	8.1%	2.8%	1.8%
Massachusetts									
1990	2,979,594	2.5%	15.6%	31.3%	18.7%	15.5%	10.7%	4.7%	1.0%
2000	3,102,837	3.1%	12.6%	27.4%	18.6%	16.3%	13.0%	6.5%	2.4%

* Employed workers 16 years and over.

Source: U.S. Census Bureau – 1990 Census STF3A and 2000 Census SF3

Labor Force Participation and Employment

The labor force is defined as the pool of individuals who are over the age of 16 and are actively seeking employment. Enrolled students, retirees, stay-at-home parents and other persons not actively seeking employment are excluded from the labor force. When comparing 1990 and 2000 labor force characteristics, it is important to consider the very different economic climates of the respective years. The recession of the early 1990s led to high unemployment rates for most areas across the country. By the latter part of the decade many areas had recovered their employment levels. A better demonstration of this is available through State employment data. However, federal Census data provide an important comparison between the population growth and labor force trends.

The difference between the number of people in the labor force and the number of people who are over 16 years of age is termed the participation rate. The participation rate is a potential source of additional workers. Flexible, part-time employment opportunities or additional support services such as skills training, public transportation or day-care facilities could influence the number of people included in the labor force. According to the 2000 Census, the Town of Shutesbury had the very high participation rate of 81.3 percent, which was considerably higher than Franklin County (69.1%), Hampshire County (65.6%), and State (66.1%) rates (Table 2-9). In regards to the participation rate for females in the region, the rate in Shutesbury was 77.3 percent, which was also much higher than Franklin County (64.4%), Hampshire County (62.7%) and the State (60.4%). Historically, Franklin County has had a higher female participation rate than in other areas of the State. Female participation rate may indicate the need for additional child-care facilities or services.

Table 2-9: Selected Labor Force Characteristics

Geography	Population 16 Years and Over	Labor Force (Civilian)	Total Employed	Unemployment rate	Participation Rate	Female Participation Rate
Shutesbury						
1990	1,142	891	866	2.9%	78.0%	72.0%
2000	1,359	1,105	1,075	2.8%	81.3%	77.3%
% Change/Difference*	19.0%	24.0%	24.1%	-0.1%	3.3%	5.3%
Franklin County						
1990	54,597	37,723	35,245	6.6%	69.1%	62.1%
2000	56,950	39,357	37,577	4.5%	69.1%	64.4%
% Change/Difference*	4.3%	4.3%	6.6%	-2.1%	0.0%	2.3%
Hampshire County						
1990	121,153	81,153	76,948	5.5%	67.0%	62.5%
2000	126,209	87,297	82,826	5.4%	65.6%	65.8%
% Change/Difference*	4.2%	7.6%	7.6%	-0.1%	-1.4%	3.3%
Massachusetts						
1990	4,809,772	3,245,950	3,027,950	7.2%	67.5%	60.3%
2000	5,010,241	3,312,039	3,161,087	4.8%	66.1%	60.4%
% Change/Difference*	4.2%	2.0%	4.4%	-2.4%	-1.4%	0.1%

Source: U.S. Census Bureau – 1990 Census STF3A and 2000 Census SF3

* The percent change from 1990 to 2000 is indicated for the population 16 years and over, the labor force and total employed. The difference in the percentage rates from 1990 to 2000 is indicated for the unemployment rate, participation rate and female participation rate.

Employment information released by the Massachusetts Division of Employment and Training (DET) is derived from federal data from the U.S. Bureau of Labor Statistics. Labor force estimates are derived from the federal Current Population Survey, the federal Current Employment Statistics program and the unemployment insurance program. Employment information released by the Census Bureau is a result of the decennial census survey. Due to the different methodologies used by the DET annual data and the Census Bureau, these figures are not directly comparable. However, both sets of data are included to give a complete overview of employment trends.

The unemployment rate describes the percentage of people in the labor force, who are presently not employed, but are actively seeking employment for a given time period. This statistic is often used as a gauge of economic prosperity or distress. Rate of unemployment may be influenced by an over abundance, or a drastic decline, in the number of employment opportunities in an area. In 2001, the Town of Shutesbury had an unemployment rate of 2 percent, much lower than Franklin County (3.2%), Hampshire County (4.1%) and the State (3.7%). The higher unemployment rates in Franklin and Hampshire Counties indicate a regional labor force that could be accessed for potential Shutesbury businesses ventures.

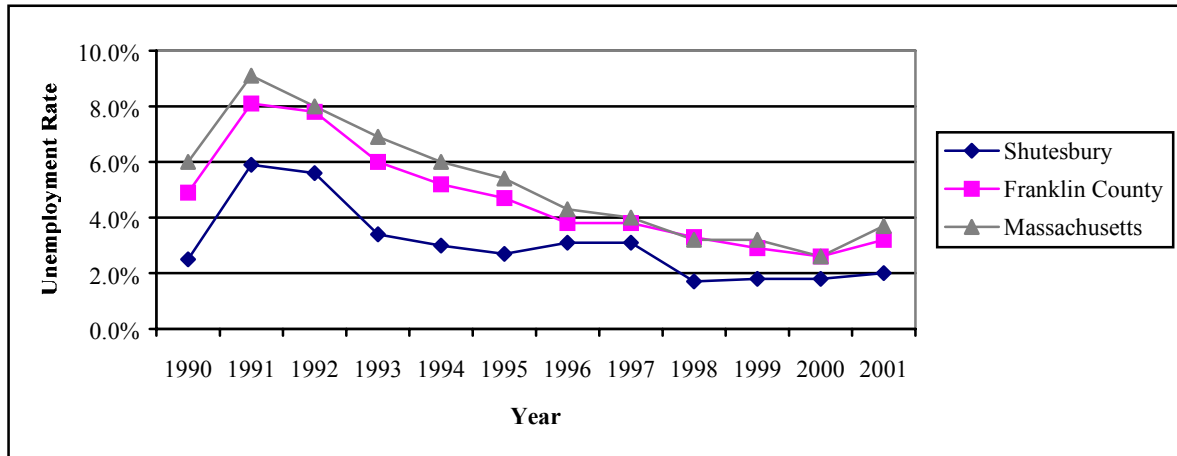
Table 2-10: Labor Force and Unemployment Data 2001

Geography	Labor Force	Employed Persons	Unemployed Persons	Unemployment Rate
Shutesbury	1,002	982	20	2.0%
Franklin County	37,376	36,189	1,187	3.2%
Hampshire County	81,176	79,170	15,020	4.1%
Massachusetts	3,283,700	3,163,100	120,600	3.7%

Source: Massachusetts Division of Employment & Training, ES-202 Data

From 1990 to 2001, the Town of Shutesbury has consistently had a lower unemployment rate than the County and the State. This lower rate indicates that Shutesbury has not been as severely impacted by the economic recessions and recoveries experienced over the past ten years as other areas have in terms of high unemployment rates. However, it is evident that Shutesbury's labor force and number of employed are influenced by the greater economy, as demonstrated by the highs and lows in Figure 2-1.

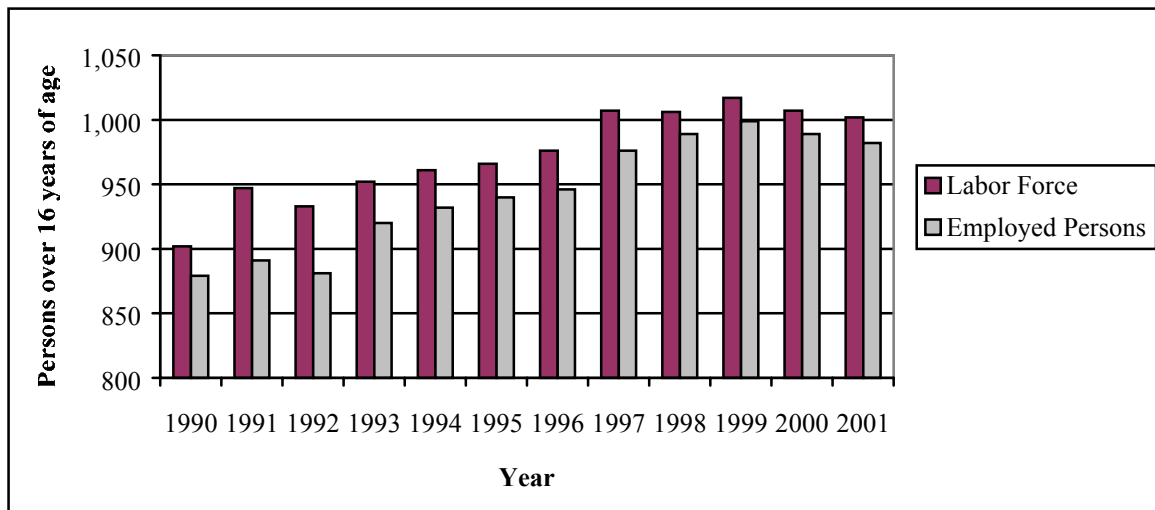
Figure 2-1: Unemployment Rates from 1990 to 2001



Source: Massachusetts Division of Employment & Training, ES-202 data

As Figure 2-2 demonstrates, from 1990 to 2001, Shutesbury has had tremendous growth in the size of its labor force overall as well as the number of employed within that labor force. In 2000 and 2001, the size of the labor force has decreased slightly. The greatest driver of employment levels may be related to the State budget and its impact on the University of Massachusetts. Layoffs may be a factor in the decreasing number of employed persons; whereas early retirement incentive programs may be a factor in a decreasing labor force.

Figure 2-2: Labor Force and Employed Persons in Shutesbury



Source: Massachusetts Division of Employment & Training, ES-202 data

Industry Sectors & Employment

An important element to the employment profile of residents is understanding the type of work done by residents. This section reviews employment trends by specific classes of workers and by industry sectors for residents. Specifically, Census Bureau has established classes of workers, which refers to the type of employer (such as a private or government employer). The Census Bureau has also identified 13 distinct employment sectors that represent different economic industries, such as manufacturing or retail trade.

According to 2000 Census data, over one-third of Shutesbury workers were employed by a federal, state or local governmental entity. This percentage of those who work for a governmental entity is significantly higher than the Franklin County, Hampshire County and State average. In addition, there is a higher proportion of self-employed workers in Shutesbury, than compared to both Counties and the State overall. While, it is not uncommon for small, rural areas to have higher proportions of workers in these two classes of workers, Shutesbury's figures for government workers is higher than most other areas. This may be assumed to be related to the prominent role the University of Massachusetts plays in the employment profile of residents.

Table 2-11: 2000 Class of Worker

Geography	Total Employed *	Private Wage and Salary Workers	Government Workers	Self-employed Workers**	Unpaid Family Workers ***
Shutesbury	1,075	49.2%	34.0%	16.6%	0.2%
Franklin County	37,577	70.5%	19.3%	9.8%	0.3%
Hampshire County	82,826	69.4%	22.9%	7.6%	0.1%
Massachusetts	3,161,087	80.0%	13.5%	6.4%	0.2%

*Employed Civilian Population 16 years of age and over.

** Self-employed workers in own, non-incorporated business.

*** Unpaid family workers are individuals who work 15 or more hours without pay in a business or on a farm operated by a relative.

Source: U.S. Census Bureau – 2000 Census SF3

For residents of Shutesbury, the largest employment sector of residents is the educational, health & social services, with 46.4 percent of all workers employed in this sector (Table 2-12). This is higher than Franklin County (30.4%), Hampshire County (38.0%) and the State (23.7%). The next largest employment sector in Shutesbury is the professional, scientific, management & administrative services industry with 8.4 percent of all workers employed in this sector. This is higher than both the Counties averages but not as high a percentage as the State. Percentage of employment in this sector tends to be low in most small, rural towns. The reason this may be higher in Shutesbury could be a combination of the close proximity of Amherst (which is a regional hub for this type of employment), and the desirability of Shutesbury as a place of residence. Another factor may be that there are a number of Shutesbury workers who are employed as independent consultants in this sector. Evidence of this is known anecdotally as well as statistically in the high number of self-employed and at-home workers.

Table 2-12: Employment by Sector in 2000

Employment Sector	Shutesbury	Franklin County	Hampshire County	Massachusetts
Educational, Health & Social Services	46.4%	30.4%	38.0%	23.7%
Professional, Scientific, Management, & Administrative Services	8.4%	6.4%	6.8%	11.6%
Retail Trade	6.2%	11.0%	9.9%	11.2%
Arts, Entertainment, Recreation, Accommodation & Food Services	6.0%	6.5%	7.8%	6.8%
Public Administration	5.8%	4.4%	4.3%	4.3%
Construction	5.4%	6.0%	4.2%	5.5%
Manufacturing	4.8%	15.0%	10.3%	12.8%
Other Services (except Public Administration)	4.8%	4.8%	4.2%	4.4%
Finance, Insurance, & Real Estate	3.9%	4.1%	4.7%	8.2%
Information Services	3.7%	2.6%	2.9%	3.7%
Wholesale Trade	2.1%	2.8%	2.4%	3.3%
Transportation, Warehousing & Utilities	1.7%	4.2%	3.7%	4.2%
Agriculture, Forestry, Fishing, Hunting, & Mining	0.7%	1.8%	0.8%	0.4%
Total Employed*	1,075	37,577	82,826	3,161,087

*Employed Civilian Population 16 years of age and over.

Source: U.S. Census Bureau – 2000 Census SF3

For most of the remaining employment sectors, Shutesbury has a similar employment distribution among sectors as compared to Franklin County, Hampshire County and the State, with a few notable exceptions. In the retail trade sector, there are less Shutesbury workers in this segment than compared to the Counties and State. This is also common for small, rural towns because of the very limited number of retail establishments in these communities. Another difference is in the manufacturing sector. For Franklin County, Hampshire County and Massachusetts, this is the second largest employment sector. According to data released in recent years, manufacturing sector employment in Franklin County has been growing in the 1990s, which is opposite from what is occurring in the State and Nation. It is most likely that those Shutesbury residents employed in the manufacturing sector commute to industrial employment centers such as Deerfield, Turners Falls and Orange. Similarly, those few Shutesbury residents employed in the transportation, warehousing & utilities sector must travel to locales that offer such employment.

There is little information available concerning employment within the Town of Shutesbury. The Massachusetts Division of Employment & Training has employment statistics by selected sectors for each municipality in the Commonwealth. However, if the level of employment meets specific criteria (such as total number of employees), the information is not released due to confidentiality requirements. In small towns such as Shutesbury, it is common for many employers to have employment figures below these thresholds. Given available information, the largest employer located within Shutesbury is the Town itself. According to Town sources, the Shutesbury Elementary School employs approximately 50 workers, while municipal departments employ 17 full- and part-time workers.

Economic Development Factors and Issues

There are many factors and issues to consider when planning for economic development. These are some of the elements that are essential for business growth and success. This section highlights some of these factors.

Land & Landscape

Natural Resources

The Town of Shutesbury is known for its scenic natural landscape with its forests, hilly terrain, and access to bodies of water. Historically, these natural resources were the foundation of the community's economy. Both lumber operations and mineral spring water bottling were successful enterprises in previous times³. Natural resource based businesses still operate, but to a lesser degree.

Today, much of the public access to this landscape is not for economic purposes but for recreational activities. The Commonwealth of Massachusetts owns extensive tracts of land managed by the Department of Environmental Management and the Metropolitan District Commission. These State-owned lands offer great hiking trails and beautiful vistas of the Quabbin Reservoir, while Lake Wyola offers swimming and boating activities.

A common desire expressed by residents in the 2000 Town Plan Survey was the preservation of the Town's rural, natural landscape. Suggestions have been put forth to use these natural assets to promote economic activities in a way that does not harm them. Some of these suggestions include increased forestry activities, a water bottling operation, imposing of fees for outdoor recreation-related activities, and using open space for agricultural purposes.

Village Areas & Municipal Facilities

The village center of Shutesbury is located at the juncture of Leverett, Wendell, and Cooleyville Roads. This area is home to the Town Hall, the Post Office, the Old Town Hall, the Shutesbury Community Church, the M. N. Spear Memorial Library and the Town center. In addition, the Town Highway Department, Fire Department and Elementary School are nearby. According to the 2000 Town Plan Survey, several new uses have been suggested for the Town center area, including a small general store or café, and a seasonal outdoor farmers market.

Another village area of note within the community is the Lake Wyola area. The Lake Wyola area is home to both year-round and seasonal dwellings, as well as a lakeside recreation area, and a private club. In the 2000 Town Plan Survey suggestions were made to locate a store or concession stand in this area.

³ Massachusetts Department of Housing & Community Development; Commonwealth Communities Profiles

Home Based Businesses & Cottage Industries

Shutesbury has a high percentage of the labor force employed at home, and this rate is increasing. In 1990, there were fifty-one (51) workers identified as working at home. The number grew to ninety-four (94) in 2000, which represents 9 percent of the total workers in Shutesbury working out of the home. Also according to 2000 Census data, 16.6 percent of all workers were self-employed. This is also a very high rate of self-employed compared to 9.8 percent in Franklin County and 6.4 percent in Massachusetts. Given these trends, it is important to review the current zoning regulations to determine potential restrictions or growth opportunities that may impact these businesses.

The Shutesbury Zoning Bylaw currently designates only one Zoning District encompassing the entire town that is called Rural Residential District⁴. Within this District, the most common of the primary allowed uses are single and two family dwellings. The Bylaw also allows, by right, various agricultural related operations as primary uses. A wide variety of accessory uses are also allowed as long as they are secondary to one of the primary uses and compatible with a residential neighborhood. No more than five (5) people, in addition to those who live at the premises, may also be employed at the site. By this count, a family operated home business might have as many as ten (10) or even more people regularly working without the need for any Special Permit. The type of accessory uses allowed varies from typical garages and swimming pools to small home-based businesses and structures that contain the operations of self-employed individuals. These self-employed individuals may work in a diversity of fields, as long as no continuous manufacturing is involved. Governmental, educational, religious or other non-profit institutional uses can only be restricted in very limited ways as specified by Massachusetts General Law Chapter 40A.

An extensive variety of uses may be allowed, after a public hearing, by Special Permit as long as the proposed use is not detrimental to the community or to the land according to the Zoning Bylaw. In fact, nearly every use conceivable may be allowed by Special Permit, including those that have many employees, as long as the use is retail in its business nature. In all cases, Special Permit findings must be made by the approving authority that the proposal is in harmony with the purpose and intent of the Bylaw and that it is compatible with the other uses in the neighborhood. The only types of uses that are specifically prohibited are trailer homes, trailer parks, junk yards, and apartment buildings larger than two dwelling units. Industrial and manufacturing facilities are not allowed under current Special Permit regulations but are not specifically prohibited.

According to the 2000 Town Plan Survey, respondents identified the most popular forms of economic development they would like to have established in Shutesbury. Most of the favored business endeavors could be home-based, such as home offices, dentist/doctor/veterinarian offices, arts & crafts production, and bed & breakfast establishments.

⁴ Shutesbury Zoning By-Laws as of the April 1997 printing.

Local support for more of these home based businesses and cottage industries could play a substantial role in future economic development opportunities in Shutesbury. If these businesses are to grow in terms of employment opportunities and/or space needs, decisions need to be made whether such development should occur within the Town, and if so, where it should go. The decision for where to locate these establishments requires an understanding of the potential direct and indirect impacts on traffic, environmental quality, residential development, and the tax base.

Municipal Taxes

The services a municipality provides is funded through the combination of state aid programs, and revenue generated from local receipts (fees) and the tax levy (property taxes), as well as other funds (free cash or reserves). Of these revenue sources, the largest amount of funds generated is by the payment of taxes by property owners. Property is assessed to determine its value for the purpose of levying taxes. A tax rate is applied to that assessment to determine the overall tax payment due.

The average single-family tax bill in the Town of Shutesbury has been within the top third of all communities ranked since 1993. Only in one fiscal year since 1990, did the average single-family tax bill decline from the previous fiscal year (from \$2,841 in 1998 to \$2,814 in 1999). Overall, Shutesbury has consistently had one of the highest property tax rates in the region, and in recent times, in the State. These rates are impacted by increased expenses related to the rising costs of education and the growing number of students (see Table 2-3 for school age population trends from 1990 to 2000).

Table 2-13: Shutesbury Selected Municipal Tax Information

Fiscal Year	Total Assessed Value	Number of Parcels	Average Assessed Value	Tax Rate (per \$1,000 assessed value)	Average Single Family Tax Bill	High to Low Rank*	State Median Single-Family Tax Bill
1990	75,001,625	640	\$117,190	\$12.75	\$1,494	166 of 323	\$1,504
1991	79,544,200	657	\$121,072	\$13.40	\$1,622	139 of 265	\$1,640
1992	84,220,700	670	\$125,703	\$14.45	\$1,816	130 of 339	\$1,663
1993	85,914,000	680	\$126,344	\$15.75	\$1,990	109 of 339	\$1,747
1994	87,882,160	693	\$126,814	\$16.39	\$2,078	110 of 340	\$1,808
1995	90,144,100	653	\$138,046	\$16.89	\$2,332	93 of 340	\$1,872
1996	94,686,400	732	\$129,353	\$18.99	\$2,456	92 of 340	\$1,959
1997	95,428,500	726	\$131,444	\$20.30	\$2,668	83 of 340	\$2,031
1998	96,823,300	728	\$132,999	\$21.36	\$2,841	76 of 340	\$2,121
1999	96,756,300	732	\$132,181	\$21.29	\$2,814	90 of 340	\$2,191
2000	100,230,300	747	\$134,177	\$22.19	\$2,977	87 of 340	\$2,297
2001	103,177,000	751	\$137,386	\$22.19	\$3,049	94 of 340	\$2,418
2002	120,010,900	753	\$159,377	\$19.97	\$3,183	99 of 340	\$2,577

* High to low rank of the municipalities ranked. There are 351 municipalities in Massachusetts.

Source: Massachusetts Department of Revenue – Division of Local Services; April 2002

The tax revenue raised in Shutesbury is from the homeowners' residential property tax assessment. With so few businesses in Town, the business sector does not off-set the high residential tax burden. To explain in further detail, commercial and industrial areas are important for two reasons. First, they are the locales of economic activity in a community, which provide services and employment opportunities. Secondly, commercial and industrial property is often very valuable and the taxes generated every year from these uses can help pay for a portion of the expenses of municipal services.

The amount of money needed to fund schools, highway maintenance, public safety, libraries and municipal government is always rising. Careful planning for how to generate this money must be examined. Property taxes for some types of land uses generate revenue for a community, while other land uses may generate the need for more services. One process to determine whether a land use has a positive or negative fiscal impact is called a Cost of Community Services (COCS) analysis.

In 1991 the American Farmland Trust (AFT) conducted a Cost of Community Services analysis for several towns in the region including Deerfield and Gill. The results of that study showed that in Deerfield, protection of farmland and open space is an effective strategy for promoting a stable tax base. The AFT study found that for every dollar generated by farmland and open space, the municipal services required by that land cost only twenty-nine cents (\$0.29) resulting in a positive fiscal impact to the town. Similarly, for every dollar generated by commercial and industrial tax revenues, only thirty-eight cents (\$0.38) were spent by the town in municipal services. In contrast, the AFT study found that for every dollar generated by residential development, the municipal services required by that land cost one dollar and sixteen cents (\$1.16) indicating that residential development costs more in terms of town services that it generates in tax revenues.

In 1995, the Southern New England Forest Consortium (SNEFC) commissioned a study of eleven (11) southern New England towns that confirmed the findings of the earlier AFT study. One of the study towns was neighboring Leverett. The purpose of the SNEFC study was to evaluate the fiscal contribution of developed land versus that of open space using the methodology developed by AFT. This study was based on allocating one year's worth of income and expenses to different land use sectors to show the impact of these land uses on the local economy. The results of the study concluded that for eleven southern New England towns, the conversion of open space for residential development is not advisable on a financial basis alone. For every dollar of tax revenue raised from the residential sector, these towns spent an average of one dollar and fourteen cents (\$1.14) on residential services, which is a negative fiscal impact. The commercial and industrial development sectors on average cost the towns only forty-three (\$0.43) cents on services for each dollar of tax revenues received generating a positive fiscal impact. This figure does not, according to the study, take into account other costs associated with commercial and industrial development such as the potential for increased residential development, increased traffic and noise pollution, the loss of open space to filter water and air, or the need to provide recreation opportunities. Finally, farm, forestland and open space in comparison costs on average forty-two (\$0.42) cents in municipal services. This is an interesting statistic demonstrating that the protection of farmland and open space not only plays an important role in protecting natural resources,

but like commercial and industrial land, it also may have a function in balancing the municipal tax base. For Shutesbury, an approach that encompasses both appropriate business development with conservation of natural resources will best satisfy the desires of residents to maintain their community character while off-setting the tax burden.

Infrastructure & Utilities

Transportation

There are two perspectives when considering a community's transportation infrastructure: the level of ease and safety of moving people and goods *to and from* the community and the level of ease and safety of moving people and goods *within* the community. In terms of the transport of people and goods to and from the community, the most significant transportation feature in Shutesbury is Route 202 that connects two east-west corridors which traverse the entire State: Route 2 in Orange to the north, and Route 9 in Belchertown to the south. In terms of the transport of people and goods within Shutesbury, there are some limitations of the transportation system due to the character of the road network. Further discussion of the transportation system in Shutesbury is included in Chapter 5.

As for transit facilities, the Franklin Regional Transit Authority provides demand-response transportation services for the elderly and disabled residents within their jurisdiction, which includes Shutesbury. No formal park-and-ride lots have been established in the community. Given the number of commuters that travel to the same destination, the University of Massachusetts, this could be a consideration. If a store or area of retail activity were to be developed, the establishment of a park-and-ride lot nearby could be beneficial to the venture.

In terms of aviation, there are three international airports located approximately within a two hours drive from Shutesbury. They are Albany International Airport in Albany, New York; Logan International Airport in Boston, Massachusetts; and Bradley International Airport in Windsor Locks, Connecticut. In addition, there are the regional airports of Green State Airport in Warwick, Rhode Island; Manchester Airport in Manchester, New Hampshire; and Worcester Regional Airport in Worcester, Massachusetts, that also provide passenger service. Locally, the transportation network includes the municipal airports of Orange Municipal Airport and Turners Falls Municipal Airport, both located adjacent to industrial parks. They serve some private passenger as well as recreational services.

Water & Sewer Systems

Shutesbury has no municipal water or sewer systems. Further discussion of community facilities such as these will be included in Chapter 4: Community Facilities and Services.

Telecommunications

The telecommunications infrastructure and services available in Shutesbury and the greater Franklin County region are often inadequate for present day business functions. Issues of reliability, affordability and access are major obstacles for large and small businesses.

Access to advanced, affordable broadband and telephone services is stifled by the absence of competition in the telecommunications services sector. Telecommunications services are critical to the region to attract and cultivate new employers as well as keep existing businesses competitive. Services such as satellite technology, cable internet, digital subscriber lines (DSL) and T-1 class broadband allow for “always on”, high speed access to the Internet and private networks. As more business to business transactions are occurring electronically, this is important for large manufacturers to communicate with their suppliers. For smaller businesses and at-home workers, affordable broadband access is important for efficient communication to retailers and clients.

For Shutesbury in particular, the lack of telecommunications broadband services is a tremendous obstacle for many home-based businesses. Most users would be satisfied with greater than dial-up speed service, such as DSL or cable broadband. Shutesbury does not have access to DSL because of the distance from the Amherst Central Office, where the equipment is located to provide such services. In addition, the Town does not have cable television service.

There are a few strategies to consider which may be able to bring broadband service to Shutesbury. Each of these strategies needs to be assessed and evaluated to determine their usefulness, their potential success, and cost of implementation. While it is of little comfort, this issue of the lack of broadband telecommunications is one faced by many small and rural communities across the region and across the country.

A regional strategy underway coordinated by the Franklin Regional Council of Governments, is called Franklin-Hampshire Connect. This project has business and community leaders from Franklin and Hampshire Counties joined together to advocate for services and to implement strategies to create a competitive telecommunications marketplace in the region. Active participation in this effort is one way to support the development of broadband deployment. Another approach is to encourage a cable television and broadband service provider to install infrastructure and provide service in Shutesbury. Other approaches include the development of a locally-based wireless broadband network or the evaluation and recommendation of satellite broadband technology for individual adoption.

Statewide Economic Development

In Fall 2002, the Commonwealth of Massachusetts Department of Economic Development produced a document to guide statewide economic development activities titled “Toward a New Prosperity: Building Regional Competitiveness Across the Commonwealth.”⁵ In the document, four factors were identified as critical elements that have driven economic development in the State: “the supply of knowledge workers; our capacity for networked

⁵ This document may be found online at <http://www.mass.gov/portal/index.jsp?pageID=aghome&agid=ded>.

entrepreneurship; the opportunities presented by globalization; and the challenge of maintaining the quality of life in our communities.” The report highlights how these factors influence future imperatives to enhance the State’s economic competitiveness. Some of the themes highlighted in this document have particular applicability to Shutesbury.

As the data show, Shutesbury has a high percentage of residents that are well-educated and related to the “knowledge sector” fields, such as education and professional services. This segment of workers is known for its entrepreneurship and mobility (greater ability to move to areas where they want to live and are not tied to a particular area for a specific economic or social need). The high quality of life available in Shutesbury is an attractor for these residents.

Another characteristic of the “knowledge sector” worker is the greater likelihood for entrepreneurial initiatives. An important element to enhance entrepreneurial and innovation endeavors are networking opportunities. Through networking, entrepreneurs may find nearby customers as well as potential collaborators and competitors. When several businesses are located in a specific geographic region and are related either through their processes or the industries they serve, this is referred to as a cluster. Often when businesses within these clusters are in contact with one another new initiatives develop and common needs are identified. Activities to foster entrepreneurship and networking may be accomplished not only on the statewide scale, but the regional and local scale as well.

Local Entrepreneurship and Business Development Resources

Economic growth is created through the development of new businesses and the expansion of existing businesses. In the 2000 Town Plan Survey, respondents identified the most popular forms of economic development they would like to have in the community. These included home-based businesses, arts and crafts based business, bed & breakfasts, dentists/doctors/veterinarian offices, restaurant/coffee shop, farming, gas station/convenience store, very small manufacturing (less than or equal to 5 employees), and software development (less than 25 employees). Each of these potential businesses is small in size and would be expected to have a minimal impact on the landscape of the community.

The development of these types of businesses in Shutesbury would most likely come from a local entrepreneur that presently lives in or nearby the community. The advantage of locally based businesses is that they are more likely to stay in the area where they originated. For example, there is a greater likelihood for a business to establish and remain in Shutesbury by a resident, rather by than someone living outside of the community.

Resources to assist entrepreneurs are vital to help home-based businesses and cottage industries become established and grow. The entrepreneurs behind these ventures understand the markets they are in, and they have thrived due to their ability to identify trends and adapt to them. They need resources to move their business plans forward. Access to a skilled labor force is necessary to lower training costs, which is a great expense for smaller firms.

Access to financial and technical resources that help these businesses grow are very important. Several regional and statewide organizations are available to assist with such efforts for new and growing businesses in Shutesbury. Contact information for economic development organizations is included in Appendix C.

An additional element for the success of small businesses is the support of these establishments by local residents. Creating linkages between local producers and retailers are a few ways to encourage local business development.

Advantages & Disadvantages Summary

Given the information in this chapter, a brief list of advantages and disadvantages for economic development in the Town of Shutesbury has been assembled. These identified circumstances reflect potential opportunities and impediments to be addressed when forming recommendations for future action.

Table 2-14: Summary of Advantages and Disadvantages

<u>Advantages</u>	<u>Disadvantages</u>
<ul style="list-style-type: none">- Desirable place to live due to high quality of life for individuals and families.- Highly educated workforce with a considerable number of workers in professional occupations.- Presence of entrepreneurs, self-employed and at-home workers.- Plentiful natural and recreational resources.- Strong sense of community.- Proximity to Amherst employment center.	<ul style="list-style-type: none">- Impacts of population growth on rural landscape and demand on services.- Poor telecommunications infrastructure.- Limited business activity.- Limited in-town access to entry level work force.- High property tax rates.- Lack of adequate transportation system for large scale commercial and industrial development.

Recommendations

The following list identifies recommendations to forward economic development in the Town of Shutesbury.

- **Create a town committee to support the strengths, address the challenges, and execute the tasks necessary to encourage entrepreneurship and business development in Shutesbury** (as outlined in this chapter).
- **Implement strategies to support entrepreneurship and business development among home-based businesses.** These strategies could include:

Business Survey

A survey of home-based businesses could be conducted. Survey respondents may or may not elect to include identifying information. The survey could be distributed through the Town newsletter and feature questions regarding the type of business, potential needs to support these businesses (for example, if a publicly available copy machine or a drop-off box for express mail delivery is needed in Town), the desirability of networking opportunities amongst these businesses, and the potential for growth of their business.

Network Development and Access to Resources

If the survey responses demonstrate an interest by the home-based business community in Town to collaborate, strategies may be pursued to create a communication system that would allow businesses to network, to access informational resources and to make recommendations to the community at-large to support their businesses. Examples of strategies may include the creation of networking opportunities, such as meetings or other events that bring people together; or the creation of an information resource center, in a community space and/or online that could provide a directory of useful small business assistance organizations.

Business Incubator Space

If the survey responses demonstrate that a space for business growth is needed in Town, another strategy to pursue could be the development of a business incubator space. A business incubator allows for multiple businesses to have their own office space while sharing resources, such as adequate infrastructure, receptionist services, conference room, or copier. A local example of a business incubator space is the Venture Center on Wells Street in Greenfield. The Venture Center was created by the Franklin County Community Development Corporation, which is also housed in the facility. The Venture Center shares receptionist services, conference rooms, and other community facilities (such as bathrooms and kitchen area) for a dozen businesses of varying sizes.

If a business incubator space is not necessitated at this time, a smaller scale business development center could be developed. A center could be created in an existing or

new community space that would offer similar resources (such as a copier, books on entrepreneurship, conference tables, etc.) and be used as site for networking activities.

- **Conduct a feasibility study to determine the potential to develop business ventures that would create revenue for the Town, by leasing municipally owned land, by municipal ownership and operation, or by private sector contribution to the tax base.** A study such as this, would inventory municipally owned land to identify appropriate parcels for potential development; explore examples of town-owned revenue generation ventures by other municipalities; and determine the suitability of specific types of development. In addition, the study would be careful not to compete with existing businesses already existing in the community. Some examples of potential operations include: alternative energy generation, renewable natural resource products, eldercare facility, or small retail store.
- **Continue to advocate for advanced telecommunications broadband services to be made available in the community.** Establish a relationship between Shutesbury town officials and the ad hoc group presently existing that is dedicated to pursuing local and regional broadband options.
- **Promote a campaign to encourage the buying of local goods and services.** Examples may include the exploration of a formal policy for town government to employ the services of local residents (in coordination with the State procurement laws and regulations); the coordination of annual events to encourage the purchase of local and regional products; or the development of a directory of local and regional businesses.

CHAPTER 3

HOUSING

Diverse, affordable housing is important for all communities. After paying housing costs, residents need adequate remaining income to cover other basic expenditures, including food, health care, utilities, and transportation. Housing is generally considered to be affordable when households spend no more than 30 percent of their gross income on housing costs. Fortunately, under this definition, housing is currently affordable for the majority of Shutesbury residents.

The Town of Shutesbury works in partnership with the Franklin County Housing and Redevelopment Authority and the Franklin Regional Council of Governments to support the development of affordable housing both regionally and within Shutesbury, and to implement the housing recommendations of the FRCOG's Regional Policy Plan. In addition, the town works to encourage appropriate and responsible housing development in Shutesbury through its planning initiatives, such as this chapter of the Master Plan, being developed under Executive Order 418.

Executive Order 418 also defined housing affordability based on spending no more than 30 percent of income on housing. Therefore, under the Executive Order 418 (EO418) definition, most housing in Shutesbury is affordable for residents. In addition, EO418 created a new affordable housing certification process. To obtain housing certification, communities must demonstrate that they are taking steps to increase their supply of housing that is affordable to individuals and families across a broad range of incomes. Housing certification is obtained on a year-to-year basis. Shutesbury received housing certification for Fiscal Year (FY) 2001 and FY 2002 and has received provisional certification for FY 2003.¹ To achieve certification, Shutesbury has shown that it is working to address the housing needs of its residents and to expand affordable housing options in the community. For FY 2003, new homes in Shutesbury and the other Franklin County towns must cost \$228,927 or less to count as affordable for housing certification purposes, and new apartments must have monthly rents of no more than \$1,210. According to the 2000 U.S. Census data, only a small number of homes and rental units in Shutesbury have costs above these thresholds.

Although housing in Shutesbury is presently affordable for most residents, the town recognizes that some residents have housing costs that are unaffordable or have other unmet housing needs. Currently, for example, many residents of low or moderate incomes are cost-burdened by their housing expenditures. Another concern is that some senior residents would like to be able to move out of their homes, but remain in Shutesbury living in apartments or in condos, but only a limited amount of such housing is currently available. The Town of Shutesbury, through this Master Plan and its other planning endeavors, is working to address such housing issues. The town is also focused on establishing options and strategies to encourage any residential

¹The Town's provisional housing certification for FY 2003 is contingent on Shutesbury undertaking housing planning through the EO418 Community Development Planning process. The creation of this Housing chapter will fulfill this requirement.

development that occurs to be sustainable and compatible with the town's and its residents' visions for Shutesbury's future.

The Housing chapter of the Shutesbury Master Plan presents an overview of housing availability and affordability in Shutesbury. It discusses how well the current housing supply is meeting demand, projects future demand, evaluates housing affordability, and includes strategies and recommendations for improving housing options and affordability for residents, such as seniors and low and moderate-income households, with unmet housing needs.

The Housing chapter contains the following main sections:

- Housing goals and objectives established during the creation of the Master Plan's vision statement;
- A discussion of the planning and legislative context for this housing chapter;
- An inventory and assessment of Shutesbury's current housing;
- An evaluation of the town's current and projected future housing demand, and a comparison between housing supply and housing demand to identify potential housing shortfalls;
- An assessment of housing affordability in Shutesbury and an analysis of how well Shutesbury's housing supply provides adequate affordable housing choices for low, moderate, and middle income individuals and households; and
- Recommendations and strategies for helping the town meet the housing goals and objectives presented earlier.

Housing Goals and Objectives

The following goals and objectives for housing were established during the creation of Shutesbury's vision statement early in the Master Planning process. They were developed from the findings of the 2001 Town Master Plan survey, and from input from residents and town boards and committees.

Goals

- To encourage a mix of housing densities, ownership patterns, prices, and building types to serve diverse households consistent with the rural character of the community.
- To provide fair, decent, safe, affordable elderly housing that meets the needs of Shutesbury's seniors and which also contributes to the tax base.
- To provide financial assistance to homeowners for State regulations, and encourage compliance with Board of Health Code with respect to Title 5 septic system upgrades, the removal of lead paint, etc.

Objectives

- Determine the most appropriate mix and location of development densities in town for single, two-family, and elderly housing.
- Identify zoning and subdivision measures that have succeeded in encouraging developers to choose cluster developments, which promote the retention of open space, over conventional subdivisions.
- Support State-sponsored programs that provide financial assistance for homeowners to comply with Title 5 septic system and radon regulations, and requirements to remove lead paint, asbestos, and urea-formaldehyde foam insulation (UFFI).
- Work with the Franklin County Housing and Redevelopment Authority and non-profit agencies to assist first-time homebuyers with home financing, and help homeowners obtain access to financial assistance for septic system upgrades and other home repairs and improvements.

Planning and Legislative Context

This section provides background information and context for this Housing chapter. It gives a brief summary of the State's legislation to encourage affordable housing, including EO418, Chapter 40B and the Community Preservation Act. It also discusses Shutesbury's current

community housing activities. Lastly, it provides a short overview of the town's zoning district and the types of residential development allowed in Shutesbury under its Zoning By-laws.

Legislation to Promote Affordable Housing

Executive Order 418 (EO418)

Issued in 2000, Executive Order 418 continues the Commonwealth's long commitment to encourage the creation of affordable housing. Executive Order 418, entitled, "Assisting Communities in Addressing the Housing Shortage," provides new incentives and resources for communities to promote affordable housing development. First, EO418 offers municipalities funding to create planning documents, such as this Master Plan, to help communities consider how they would like to grow in terms of potential future residential and economic development, and help them establish options and strategies for addressing future development pressures.

In addition, as mentioned earlier, EO418 created a new affordable housing certification process. Municipalities must obtain housing certification to be eligible to receive funds through certain discretionary rolling grant programs, and to receive bonus rating points for other grant programs. The affected programs are administered by the Department of Housing and Community Development (DHCD), the Executive Office of Environmental Affairs (EOEA), the Department of Economic Development (DED), and the Executive Office of Transportation and Construction (EOTC). The rolling application grant programs requiring housing certification are expected to provide a total of \$35 million in funding to communities statewide in Fiscal Year (FY) 2003 (which started July 1, 2002), and the competitive grant programs, which give a rating bonus for housing certification, should provide \$367 million. To receive housing certification, communities must demonstrate that they are working to increase their supply of both rental and owner-occupied housing that is affordable to individuals and families across a broad range of incomes.

Housing certification is obtained on an annual basis. Shutesbury received housing certification for FY 2001 and FY 2002 and provisional certification for FY 2003.² To achieve certification, Shutesbury has demonstrated that it is taking steps to address the housing needs of its residents, and that it is working to expand affordable housing options for individuals and families with low, middle, and moderate incomes. Under EO418, low-income households are considered to be those making 50 percent or less of the area-wide median income, moderate-income households are those making up to 80 percent of the area-wide median income, and middle-income households are those making up to 150 percent of the area-wide median income. The area-wide median income is defined as the median family income in the county where the housing units are located. The median family income describes the middle family income level for the county, with half of the families earning more than the median income, and half the families earning less. Because median income figures are relatively unaffected by atypical families that are very

² The Town's provisional housing certification for FY 2003 is contingent on Shutesbury undertaking housing planning through the EO418 Community Development Planning process. The creation of this Housing chapter fulfills this requirement.

wealthy or very poor, they are considered a useful way for measuring the income in a community.

To count for housing certification, new housing units can be either owner-occupied or rental housing. Qualifying rental units for housing certification must be affordable to families earning 100 percent of the area-wide median income, and qualifying homeownership units must be affordable to families earning 150 percent of the area-wide median income. The median income used for housing certification for Franklin County towns for Fiscal Year (FY) 2003 is \$48,400. Housing counts as affordable if families earning the above income levels spend no more than 30 percent of their incomes on housing expenditures. Based on the 30 percent threshold, new homes in Franklin County must cost \$228,927 or less to count as affordable for housing certification purposes in FY 2003, and new apartments must have monthly rents of no more than \$1,210. According to the 2000 U.S. Census data, only a few homes and rental units in Shutesbury have costs above these limits.

Chapter 40B

In 1969, the Massachusetts Legislature passed the Comprehensive Permit Law (M.G.L. Chapter 40B, Sections 20-23), to promote the creation of affordable housing statewide. With Chapter 40B, the Legislature streamlined the development permit process for affordable housing projects, and established the goal of increasing the amount of affordable housing in each community to 10 percent of the total housing stock. Under Chapter 40B, communities where less than 10 percent of the housing units are affordable may face new housing development that overrides local zoning restrictions, such as density and setback requirements. In these communities, a developer can submit a comprehensive permit application, known as a Chapter 40B application, for affordable housing development that overrides local zoning. This application is acted upon by the local Special Permit Granting Authority (SPGA). If the SPGA turns down the permit, the developer may be able to appeal the decision to the State Housing Appeals Committee, which can overrule the decision, and allow the housing project to proceed.

The Chapter 40B definition of “affordable housing” is more restrictive than the general definition based on housing costs not exceeding 30 percent of household income. In determining a town’s total number of affordable housing units for Chapter 40B, the State has historically only included units with rents or sales prices that are affordable, and which are only for households of low or moderate income. These restrictions must run for at least 30 years after construction. Chapter 40B units have traditionally also been required to be built with direct subsidies through State or Federal housing assistance programs. All unsubsidized units have been excluded from Chapter 40B status, even if their monthly costs are less than 30 percent of the median household income. This restriction is a disadvantage to rural communities where subsidized housing is less likely to be developed, but where housing costs relative to income may be lower than in more urban places. Under the general definition of affordability (less than 30 percent of income spent on housing), 73 percent of Shutesbury households have housing, which is affordable based on their incomes. Under the Chapter 40B definition of “affordable,” as of October 2001,

Shutesbury had no affordable housing (0.0%). As of 2001, only three communities in Franklin County had achieved 10 percent affordable housing: Greenfield, Orange, and Wendell.³

The State has recently begun to revise Chapter 40B to provide communities with more flexibility and local control in expanding their affordable housing supply. As a result of these changes, when a community has not yet reached the 10 percent affordable housing level, but has demonstrated a commitment to increasing its affordable housing supply, the local Zoning Board of Appeals has the ability to deny a Chapter 40B development permit. This commitment can be demonstrated through the creation of a local housing plan, which has been certified by DCHD and by the community increasing its number of Chapter 40B units for low and moderate-income households by at least 0.75% of the town's total units every calendar year. In addition, local SPGAs can now refuse to issue permits for large-scale housing projects that are inappropriately sized for their community.

The State has also begun to expand Chapter 40B's definition of "affordable housing" to count additional units towards the 10 percent goal. Among the units that can now count as affordable are locally subsidized housing units, long-term housing for the mentally ill or mentally retarded, housing created through the Community Preservation Act (M.G.L. Chapter 44B), and accessory apartments constructed after June 30, 2002. These types of housing all now count as affordable as long as they are serving low and moderate-income residents. Shutesbury's affordable housing percentage under Chapter 40B may increase as a result of these changes and the expanded "affordable housing" definition. It is anticipated that there will be further reforms and revisions to Chapter 40B, and additional expansions of its "affordable housing" definition over the next few years. These changes may further increase the town's percentage of affordable housing under Chapter 40B, and will provide the town with more flexibility in reaching the 10 percent affordable housing level.

Community Preservation Act

The Massachusetts Community Preservation Act (M.G.L. Chapter 44B), signed into law in 2000, is designed to help communities fund projects to address local needs related to affordable housing, historic preservation, and open space protection. Municipalities adopt the Community Preservation Act (CPA) on a local basis, through a ballot referendum. Communities that approve the CPA can impose a property tax surcharge of up to 3 percent, with possible exemptions for the first \$100,000 of residential property value, for homes owned by low-income households or seniors of moderate income, or for commercial or industrial properties. The funds collected through this surcharge are set aside in a local Community Preservation Fund. The CPA stipulates that at least 10 percent of the annual monies raised for the Community Preservation Fund must be spent, or set aside for future spending, on each of the following: open space (excluding recreational purposes), historic preservation, and community housing. Community housing is defined, as being housing that is affordable to individuals or families earning 100 percent or less of the area-wide median income.

³ The State has questions about the Chapter 40B affordable housing count for Wendell, and may be revising Wendell's Chapter 40B totals downward, which could put Wendell below the 10 percent level.

The remaining 70 percent of the CPA funds may be allocated to any one or a combination of the three main uses, including public recreational purposes, at the discretion of the town's Community Preservation Committee, and subject to the approval of Town Meeting. This gives communities the flexibility to use the money for community-designated priorities.

To encourage municipalities to adopt the CPA, Massachusetts has established the Massachusetts Community Preservation Trust Fund, which provides a match for local Community Preservation Fund monies. In fiscal year 2002, more than \$17 million in matching funds were distributed to local communities through the trust fund.

As of February 2003, 58 communities statewide have adopted the CPA. Leverett is the only one in Franklin County. In 2001, a special Shutesbury Town Meeting considered placing an article on enacting the CPA in Shutesbury on an upcoming election ballot. Town Meeting voted 60 to 14, not to do so. One of the major concerns was the costs the town would incur in administering the CPA tax surcharge.

Regional and Town Initiatives and Policies to Create Affordable Housing

As discussed in Shutesbury's previous housing certification applications (for FY 2001 and FY 2002), the town has a multi-faceted approach for community housing. First, the town has adopted the Franklin Regional Council of Government's Regional Policy Plan, a policy document to help guide future growth in Franklin County. The Regional Policy Plan contains numerous strategies for promoting appropriate development, including the creation of affordable housing, in the region. Second, like other Franklin County communities, Shutesbury works closely with the Franklin County Housing and Redevelopment Authority and its affiliated non-profit, Rural Development, Inc., to facilitate the development of affordable units in the region, including in Shutesbury. Third, the town works to support appropriate and responsible housing development through its planning initiatives and zoning regulations.

Regional Policy Plan

The Franklin Regional Council of Governments (FRCOG) established a Regional Policy Plan in 1998. The Regional Policy Plan is a policy document to help guide future growth in Franklin County. The Regional Policy Plan includes an assessment of housing affordability on a regional basis. Steps taken to implement the Policy Plan's housing-related recommendations include close coordination between communities and the regional housing authority, the Franklin County Housing and Redevelopment Authority (HRA). (*Please see Appendix D for a full list of the Regional Policy Plan's housing goals and recommendations.*) The Regional Policy Plan also addresses transportation planning and regional land use. It suggests areas that may be suitable for future housing development, and discusses transportation options for serving potential new development.

The HRA and its regional affordable housing partner, Rural Development, Inc. (RDI), have worked with Shutesbury and other communities in the region in conjunction with the Regional Policy Plan to identify sites to develop affordable single-family housing and rental housing. In 2001, one lot was identified for Shutesbury on Wendell Road, and a home for a low-income

family has now been built on that site. RDI also built at least five other housing units in Shutesbury during the late 1980s and early 1990s. The units constructed by RDI, although built with subsidies, do not count as affordable housing under Chapter 40B because they do not have deed restrictions or other restrictions to guarantee that they will be part of the long-term affordable housing stock for low and moderate income households. Under Chapter 40B, affordable housing is required to have rents or sales prices restricted to affordable levels for low and moderate income households for at least thirty years after construction.

Franklin County Housing and Redevelopment Authority and Rural Development Inc. Initiatives

Shutesbury works with the local and regional public housing authority, the Franklin Regional Housing and Redevelopment Authority (HRA), to address local housing and community development needs. The HRA was created in 1973 by the Massachusetts Legislature as the Commonwealth's first regional public housing authority. At that time, the State recognized that the twenty-six towns of the Franklin County, as small communities in the State's most rural county, did not have sufficient access to housing and community development resources, and were unlikely to develop and sustain adequate housing and community development capacity independently. The HRA was established to help address housing and development issues and to assist with housing and community development, both for the region as a whole and for local communities.

The HRA accesses numerous funding sources for housing and community projects. It works with Shutesbury and other towns regarding affordable homeownership and homeownership counseling, rental housing and tenant/landlord information and counseling, housing rehabilitation, Title 5 updates, and municipal infrastructure. The HRA also coordinates these activities with other agencies and organizations, including Rural Development, Inc (RDI), a non-profit HRA spin-off organization that builds affordable first-time homeowner single-family homes and rental housing for seniors, families, and special needs residents.

To date, the HRA has secured more than \$220 million in housing and community development resources for Franklin County towns. In addition, RDI has developed more than \$15 million in single and multi-family housing in the past ten years. Twelve homes are built each year in varying communities, and approximately sixty have been constructed in the past six years countywide. As mentioned earlier, one recent HRA housing project in Shutesbury was a new single-family home for a low-income family. The resources that HRA and RDI use for their projects come from a variety of sources, including Massachusetts Department of Community Development (DHCD) HOME funds, U.S. Department of Agriculture Rural Development funds, and Section 8 Home Ownership Program funds from the Housing Assistance Council. HRA and RDI programs help hundreds of families each year in Franklin County.

In addition to the regional housing programs and initiatives, in FY 2002, Shutesbury was awarded \$600,000 in Community Development Block Grant (CDBG) funding. More than half of these funds are being used to make the town offices more handicapped accessible. Approximately \$140,000 of the remainder will be used for housing rehabilitation and to bring homes owned by low and moderate-income households up to code. The housing rehabilitation

program, which is administered by the Franklin County Regional Housing and Redevelopment Authority (HRA), provides 0% interest loans of up to \$25,000 for repairs, lead paint abatement, Title 5 updates, and energy-efficient improvements. These loans are not required to be repaid until the rehabbed home is sold. HRA estimates that there will be sufficient funds to rehabilitate six to eight homes.

Shutesbury's Zoning for Residential Development

The entire Town of Shutesbury is designated as one zoning district, Rural Residential. Shutesbury allows single-family homes and two-family dwellings by right (Shutesbury Zoning By-laws, Section II.B.1 and II.B.2).

It also allows residents to rent rooms to lodgers, boarders, or tourists provided that no separate cooking facilities are maintained, and no more than three rooms are rented out. Such accommodations are limited to no more than six people, in addition to the resident family (Shutesbury Zoning By-laws, Section II.B.5c).

There are also a number of residential uses that are allowed by special permit. They are:

- The conversion of a single-family dwelling to a two-family dwelling (Shutesbury Zoning By-laws, Section II.C.12); and
- Back lot residential development, which allows for reduced roadway frontage in exchange for land being set aside as open space (Back Lot with Open Space Setaside Amendment to the Shutesbury Zoning By-laws).

Under its Rate of Development By-law, which was last revised at the Spring 2002 Town Meeting, Shutesbury permits the construction of up to six new dwelling units per year (Shutesbury Zoning By-laws, Section III.F). The Rate of Development By-law permits exemptions for low and moderate-income housing. Housing units constructed with a comprehensive (Chapter 40B) permit count towards the town's limit of 6 units per year. However, if a proposed comprehensive permit development contains more than 6 units that would be affordable to low and moderate-income households, the project would be exempted from the six-unit threshold, and would be allowed to be built.

All residential development in Shutesbury must adhere to the town requirements regarding lot size, setbacks, sewage disposal, and parking. Residential development allowed only by special permit must also meet additional requirements. Shutesbury's Zoning By-laws offer flexibility for future housing development, while realistically planning for future growth. They permit the construction of new-single family and two-family structures by right, and also provide a process for the other suitable types of residential development.

Current Housing Stock Inventory and Assessment

This section summarizes Shutesbury’s current housing characteristics, including housing type, housing age, tenancy, and new construction trends. The section also compares housing statistics for Shutesbury to those for Franklin County and for Massachusetts overall. The information presented in this section comes primarily from the U.S. Census (long form). Additional information includes building permit records provided by the Franklin County Cooperative Inspection Program and real estate data from the Warren Group.

Housing Supply

Shutesbury has experienced tremendous growth during the past three decades. In 1970, the town had 489 residents. By 2000, its population had grown to 1,810 (U.S. Census), an increase of 270 percent in 30 years. The main factor behind Shutesbury’s population growth has been a large immigration of new residents seeking to experience the town’s high quality of life, including its good schools, and nearby job opportunities.

The increase in people wanting to move to Shutesbury has led to growing housing demand, which in turn has promoted the creation of new housing units. Figures from the U.S. Census Bureau indicate that during the past two decades, the number of housing units in Shutesbury increased by 51 percent, growing from 536 (1980) to 807 (2000) (*see Table 3-1*).

Table 3-1: Housing Units in Shutesbury, 1980-2000, Comparison with the County and State

Area	Number of Housing Units			Percentage Change		
	1980	1990	2000	1980-1990	1990-2000	1980-2000
Shutesbury	536	716	807	33.6%	12.7%	+50.6%
Franklin County	26,832	30,394	31,939	+13.3%	+5.1%	+19.0%
Massachusetts	2,208,146	2,472,711	2,621,989	+12.0%	+6.0%	+18.7%

Sources: U.S. Census Bureau, Census of Population & Housing, 1980, 1990, and 2000.

Table 3-1 shows that Shutesbury experienced much more housing growth than Franklin County and Massachusetts overall between 1980 and 2000. Contributing factors to this trend include the availability of land for development, Shutesbury’s relatively low property values at the time, the town’s quality schools, and close proximity to good jobs. As is shown in Appendix D, Shutesbury also had a higher rate of housing creation than any of its neighboring towns. During the twenty-year period, the number of homes in both Franklin County and in Massachusetts overall increased by 19 percent, compared to 51 percent for Shutesbury. Table 3-1 also indicates that for Shutesbury, Franklin County, and the State, more new housing construction and growth occurred during the 1980s than the 1990s.

It is expected that Shutesbury’s housing growth will slow further during this decade, in part because of the town’s Rate of Development By-law, which restricts new home construction to a maximum of six dwelling units per year. As was discussed earlier, the Rate of Development By-law allows affordable housing to be exempt from this particular by-law, though permits issued for the units none the less count towards the building cap.

Types of Housing

Housing in Shutesbury consists primarily of single-family homes (*see Table 3-2*). According to the 2000 U.S. Census, over 90 percent (93%) of Shutesbury's housing units are single-family residences; a category that includes both detached homes and attached units such as townhouses and condos. According to the U.S. Census, the rest of the town's housing mix is comprised of duplexes (4% of the town's total units), 3-4 unit buildings (2%) and mobile homes (less than 1%). Because the town does not allow 3-4 unit buildings, it is thought that the U.S. Census may be overstating the number that exist, though a few such buildings may have been built prior to the enactment of the town's Zoning By-laws in 1972. Shutesbury has no housing structures with five or more units.

Table 3-2: Types of Housing Structures in Shutesbury, 2000

Structure Type	Number of Units	Percent of all Units
Single Unit, detached	731	90.6%
Single Unit, attached	20	2.5%
Single Unit, total	751	93.1%
Two Unit Building	34	4.2%
3-4 Unit Building	18	2.2%
5 or more Unit Building	0	0.0%
Mobile Home	4	0.5%
	807	100.0%

Source: U.S. Census Bureau, Census of Population and Housing, 2000.

Shutesbury's proportion of single-family residences is greater than that for Franklin County or for the State as a whole. The Census Bureau estimates that 66 percent of housing units countywide and 56 percent of housing units statewide consist of single-family homes (2000 U.S. Census).

Housing Age

According to the 2000 U.S. Census, almost 60 percent (58%) of the homes in Shutesbury have been built since 1970, and only 15 percent of the town's homes were constructed before 1940 (*See the Housing Chapter Appendix D for more info on housing age*). Since such a large percentage of Shutesbury's housing stock is relatively recent, the town does not face many of the problems that are typically seen with older housing stocks. These problems can include lead paint. The State Department of Public Health (DPH) screens children up to age six for lead paint poisoning and Massachusetts law requires all children to be screened before they can enroll in kindergarten. The DPH's most recent statistics (FY 2001) show that no screened children in Shutesbury have elevated blood lead levels.

New Construction

Comparisons of the 1990 and 2000 U.S. Census data on housing type (*provided in Appendix D*) show that the number and percentage of single-family homes in Shutesbury increased during the 1990-2000 period. According to the Census info on housing type, ninety-eight new single-family homes were constructed during this time frame. Building permit data from the Franklin County Cooperative Inspection Program (FCCIP) shows the same trends. The FCCIP provides building inspection services and permit issuances for Shutesbury and sixteen other towns in Franklin County.

Table 3-3 provides a summary of authorized new housing construction in Shutesbury from January 1993 to December 2002, based on FCCIP's building permit data. Data for earlier periods were not readily available. Over the 1993-2002 period, the FCCIP issued 68 building permits authorizing a total of 72 units of new residential construction in Shutesbury, and building permits for reconstructing two previously existing homes in Shutesbury that had been damaged or demolished. Of the 68 permits, 62 (91%) were for new-single-family homes, and 4 (6%) were for new two-family homes. The last two permits were to convert a single-family home to a two-unit home, and to convert a shop into a single-family dwelling.

Of course, not all of the potential homes for which new construction permits are granted are actually built, but most are. For example, a review of Town Assessors' records of properties with new construction permits issued between 1998 and 2000 showed that almost all the permitted new construction was either completed or underway.

Table 3-3: Authorized Construction for New Housing Units in Shutesbury, 1993-2002

Year	Number of New Housing Units Authorized		
	New Single-Family Structures*	New 2-Unit Dwelling, or Conversion to Single-Family or 2-Unit Dwelling	Total Number of New Housing Units Authorized*
2002	5	(1) New Two-Family – adds 2 units	7
2001	6	(2) New Two-Family – adds 4 units	10
2000	5	(1) New Two-Family – adds 2 units	7
1999	3	0	3
1998	11	0	11
1997	2	(1) Conversion of a Woodshop to a Dwelling – adds 1 unit	3
1996	4	0	4
1995	7	(1) Conversion of a One-Family to a Two-Family – adds 1 unit	8
1994	13	0	13
1993	6	0	6
Total	62	10	72

*Does not include building permits to reconstruct or rebuilt previously existing homes. There were two such permits issued during the 1993-2002 period. Does also not include other building permits for renovations, unless a new housing unit is added, for example, with the conversion of a single-family home to a two-family.

Source: Franklin County Cooperative Inspection Program, data obtained January 2003.

An important characteristic of Shutesbury’s recent residential development is its location. Much of the new development is taking place outside of the historic village areas. Table 3-4 summarizes the top locations for the new residential construction permits listed in Table 3-3. The table includes all the roads in Shutesbury with three or more new housing units authorized from 1993 to 2002 (excluding reconstructed units). During this time period, the top three locations for new construction were Wendell Road with 15 authorized units, Montague Road with 8 units, and Pratt Corner Road with 6 units. Combined, the nine streets listed in Table 3-4 account for 72 percent, or 52 of the 72 new housing units that were authorized from 1993 to 2002.

Table 3-4: Primary Locations of Authorized New Residential Construction, 1993-2002

Road	Number of New Housing Units Authorized* 1993-2002	Road Length (miles)
Wendell Road	15	4.2
Montague Road	8	2.7
Pratt Corner Road	6	3.4
Pelham Hill Road	5	2.5
Locks Pond Road	4	1.9
Round Hills Road	4	0.1
West Pelham Road	4	2.8
Cooleyville Road	3	2.1
Old Orchard Road	3	0.1
Total for These 9 Roads	52	19.8

*Does not include building permits to reconstruct or rebuilt previously existing homes. There were two such permits issued during the 1993-2002 period. Does also not include other building permits for renovations, unless a new housing unit is added, for example, with the conversion of a single-family home to a two family.

Sources: Building permit data: Franklin County Cooperative Inspection Program, obtained January 2003; Road length: Massachusetts Highway Department, Road Inventory File, 2003.

As residential development in Shutesbury increases and also becomes more spread out over time, the town’s cost per household of providing services such as police and fire protection, school transportation, snow removal, and road maintenance, may grow due to the larger population density in outlying parts of town and the greater total population.

Housing Tenancy

Housing tenancy refers to whether a house is occupied by a renter or homeowner. Most of Shutesbury’s housing units are owner-occupied. As shown in Table 3-5, homeowners inhabit 68 percent of all Shutesbury’s housing units, and 83 percent of the town’s occupied housing units (2000 U.S. Census). This high level of home-ownership suggests that most people who live in, or move to, Shutesbury can afford to buy a home in the town. (Table 3-5 indicates that in 2000, only 82 percent of the town’s housing units were occupied, and 18 percent were therefore unoccupied. The Census Bureau only considers homes with year-round residents to be occupied. Homes with seasonal or occasional residents, such as the summer homes at Lake Wyola are considered unoccupied.)

Table 3-5: Housing Tenancy in Shutesbury, 1990-2000

Unit Type	1990			2000			Change in Occupied Units 1990-2000
	Number of Units	Percent of Occupied Units	Percent of All Units	Number of Units	Percent of Occupied Units	Percent of All Units	
Owner-Occupied	460	80.0%	64.2%	547	82.6%	67.8%	18.9%
Renter-Occupied	115	20.0%	16.1%	115	17.4%	14.3%	0.0%
Total Occupied (Households)*	575	100.0%	80.3%	662	100.0%	82.0%	15.1%

*Each household occupies one housing unit. Only housing units that have year-round residents are considered occupied. The Census Bureau considers housing units, which have seasonal or occasional residents (i.e. summer homes) to be unoccupied. Source: U.S. Census Bureau, Census of Population & Housing, 1990 and 2000.

Shutesbury’s level of renter-occupancy is lower than that for Franklin County and Massachusetts overall (see Table 3-6). Countywide, renters account for one-third (33%) of the occupied housing units, and statewide, they account for 38 percent.

Table 3-6: Housing Tenancy in Shutesbury, 2000, Comparison to the County and State

Area	Total Housing Units	Occupied Housing Units*	Percent Occupied	Of Occupied Units	
				Percent Owner Occupied	Percent Renter Occupied
Shutesbury	807	662	82.0%	82.6%	17.4%
Franklin County	31,939	29,466	92.2%	66.9%	33.1%
Massachusetts	2,621,989	2,443,580	93.2%	61.7%	38.3%

*Only housing units that have year-round residents are considered occupied. The Census Bureau considers housing units, which have only seasonal or occasional residents (i.e. summer homes) to be unoccupied. Source: U.S. Census Bureau, Census of Population & Housing, 2000.

Housing Vacancy Levels

As housing demand in Shutesbury has increased and housing has become scarcer, housing vacancy levels have decreased. The Census Bureau reports that between over the past two decades, the percentage of unoccupied units in Shutesbury dropped from 30 percent of the town’s total housing units to 18 percent. As was noted earlier, the Census Bureau considers homes with only seasonal or occasional use to be “vacant”, even though the residence may be used as a second home or vacation home. Other housing units that also considered vacant are those that are for sale or rent and not currently lived in, those that have been rented or sold but which have no residents, and those that are uninhabitable.

Shutesbury has a relatively large percentage of homes with seasonal or occasional residents; these homes represent 16 percent (131 units) of the town’s total housing stock (2000 U.S. Census). In contrast, countywide, such units only account for 3 percent of all housing. Also, in Shutesbury, homes with seasonal or occasional residents represent 90 percent of all the “vacant” housing units. These homes are not generally available for occupancy by full-time town residents. Consequently, the realistic housing vacancy rate in Shutesbury is quite low.

The calculated housing vacancy rates for Shutesbury shown in Table 3-7 below estimate the realistic vacancy rate based on homes and rental units that could be available to new residents to live in year round.⁴ According to the 2000 U.S. Census, the current homeowner vacancy rate in Shutesbury is just 1.8 percent and the rental vacancy rate is slightly lower at 1.7 percent. As shown in the table, between 1990 and 2000, the homeowner vacancy rate in Shutesbury declined by one-third (31%), while the rental vacancy rate stayed constant. Shutesbury has a relatively small number of rental units, approximately 117 units in total. As a result, a rental vacancy rate of 1.7 percent means that only 2-3 rental units are available for renting at any one time. In comparison, the homeowner vacancy rate of 1.7 percent represents approximately nine homes (*Please see Appendix D for more information on vacancies in Shutesbury*).

Table 3-7: Homeowner and Rental Vacancy Rates in Shutesbury, 1990-2000

	1990	2000
Homeowner Vacancy Rate	2.6%	1.8%
Rental Vacancy Rate	1.7%	1.7%

Source: U.S. Census Bureau, Census of Population & Housing, 1990 and 2000.

According to housing organizations such as the Franklin County Regional Housing and Redevelopment Authority, a healthy housing market is generally considered to have vacancy rates between 4 and 5 percent for rental properties, and 2 and 3 percent for owner-occupied homes. Because rural communities typically have less housing turnover than more urban places, lower vacancy rates in rural towns, such as Shutesbury, are reasonable.

Shutesbury’s low housing vacancy levels reflect that fact that Shutesbury is a desirable place to live and has a high quality of life. However, the low level of housing vacancies also suggests that that people seeking to move to Shutesbury, or to move within town, may have difficulty finding appropriate, affordable housing.

Another potential concern for Shutesbury is the growth that could occur if the town’s high housing demand leads to the conversion of seasonal homes to full-time residences. This growth, in turn, could result in higher municipal costs as the additional full-time residents seek year-round services, including educational services for their children. It is estimated that approximately half the homes at Lake Wyola are now used as year-round residences, and that more will be converted to year-round use in the coming years.

Population Characteristics that Influence Housing Demand

This section examines population characteristics that influence housing demand. These population characteristics include population size, household size and age distribution. This

⁴ These calculated housing vacancy rates exclude housing, which is considered to be vacant, but which is not available for rent or purchase. Such housing includes residences that have seasonal or occasional occupants, as well as homes that are uninhabitable, and homes that have been sold or rented, but which remain unoccupied.

section also discusses potential housing needs, both for Shutesbury’s population in general, and for particular population segments, such as seniors and the disabled.

Total Population

Shutesbury has grown tremendously in the last thirty years, especially during the 1970s and 1980s. During the 1970s, the town’s population more than doubled as Shutesbury grew from 486 residents to 1,049. Then during the 1980s, Shutesbury grew by another 512 people (49%). Overall, from 1970 to 2000, the town’s population grew by a phenomenal 270 percent (*see Table 3-8*).

As shown in Table 3-8, during the past three decades, Shutesbury’s population growth far exceeded that of Franklin County and Massachusetts overall. Between 1970 and 2000, Franklin County grew by 21 percent, and the State by 12 percent.

Table 3-8: Population for Shutesbury, 1970-2000, Comparison to the County and State

Area	Population				% Change			
	1970	1980	1990	2000	1970-1980	1980-1990	1990-2000	1970-2000
Shutesbury	489	1,049	1,561	1,810	114.5%	48.8%	16.0%	270.1%
Franklin County	59,210	64,317	70,092	71,535	8.6%	9.0%	2.1%	20.8%
Massachusetts	5,689,377	5,737,037	6,016,425	6,349,097	0.8%	4.9%	5.5%	11.6%

Source: U.S. Census Bureau, Census of Population & Housing, 1970, 1980, 1990, and 2000.

Households

The number of households is more important than total population size for determining the amount of housing needed by the community. A household is generally defined as a group of people living together in one housing unit. Changes in the number of households reflect not only changes in population, but also societal shifts that influence average household size.

Nationally, average household size is declining. The reduction in people per household is occurring for a variety of reasons. These reasons include a decrease in the average number of children per family and an increase in the number of single-parent households. Other factors are that families today are more mobile and more spread out spatially than in the past and that more adults now live by themselves. In Shutesbury, 116 adults presently reside by themselves. They represent 18 percent of the town’s adult population and 18 percent of the town’s households (2000 U.S. Census).

As Table 3-9 indicates, the average household size in Shutesbury declined 2 percent between 1980 and 2000 (2000 U.S. Census). This decline is similar to, but smaller than, the 8 percent decrease in household size seen at the County and State levels for the same period.

The figures in Table 3-9 show that Shutesbury experienced a slight increase in average household size during the 1990s, contrary to the general trend. During the same period, the average household size in Franklin County declined 4 percent, and the average household size in

the State overall fell 3 percent. One factor in Shutesbury that could have contributed to the slight increase is the growth in the number of households with children that occurred during the 1990s, due to good schools and other services and the availability of land for development. During the 1990s, the number of households in Shutesbury with children under 18 grew by 20 percent, while in Franklin County overall, the number of these households decreased by 3 percent.

Table 3-9: Average Household Size in Shutesbury, 1980-2000, Comparison to the County and State

Area	Average Number of Persons Per Household			Percentage Change		
	1980	1990	2000	1980-1990	1990-2000	1980-2000
Shutesbury	2.79	2.71	2.73	-2.9%	+0.7%	-2.2%
Franklin County	2.65	2.53	2.43	-4.5%	-4.0%	-8.3%
Massachusetts	2.82	2.68	2.60	-5.0%	-3.0%	-7.9%

Source: U.S. Census Bureau, Census of Population & Housing, 1980, 1990, and 2000.

Consistent with the factors mentioned above, such as the large population growth and the slight decrease in average household size, the number of total households in Shutesbury grew by 75 percent in the last two decades, increasing from 376 (1980) to 662 (2000).

During the past few decades, as more people have wanted to move to Shutesbury, there has been a growing demand for housing. This demand for housing, which has grown faster than the housing supply, has resulted in rising housing prices. These higher housing prices and greater housing demand, can make it difficult for people who are interested in moving to Shutesbury to find quality housing that is also affordable. Higher prices and housing demand can also make it hard for current residents to move within the town.

In addition, the straight comparison of changes in population and housing units does not capture factors beyond household growth alone that can increase the demand for new housing units, or for certain kinds of units. For one, it does not differentiate between renter-occupied and owner-occupied units. In addition, it does not address the issue of how well the characteristics of the current housing, including size, cost, accessibility, and location, meet the present and future needs of the community's residents. One issue in Shutesbury, for example, is the demand for senior housing among residents who wish to continue to live in town as they get older. It is important that such housing be made available, and that it be both affordable and accessible to those who wish to live in it. According to the 2000 U.S. Census, 28 percent of Shutesbury residents 65 and over have a disability. Any senior housing should include accommodations for this disabled population.

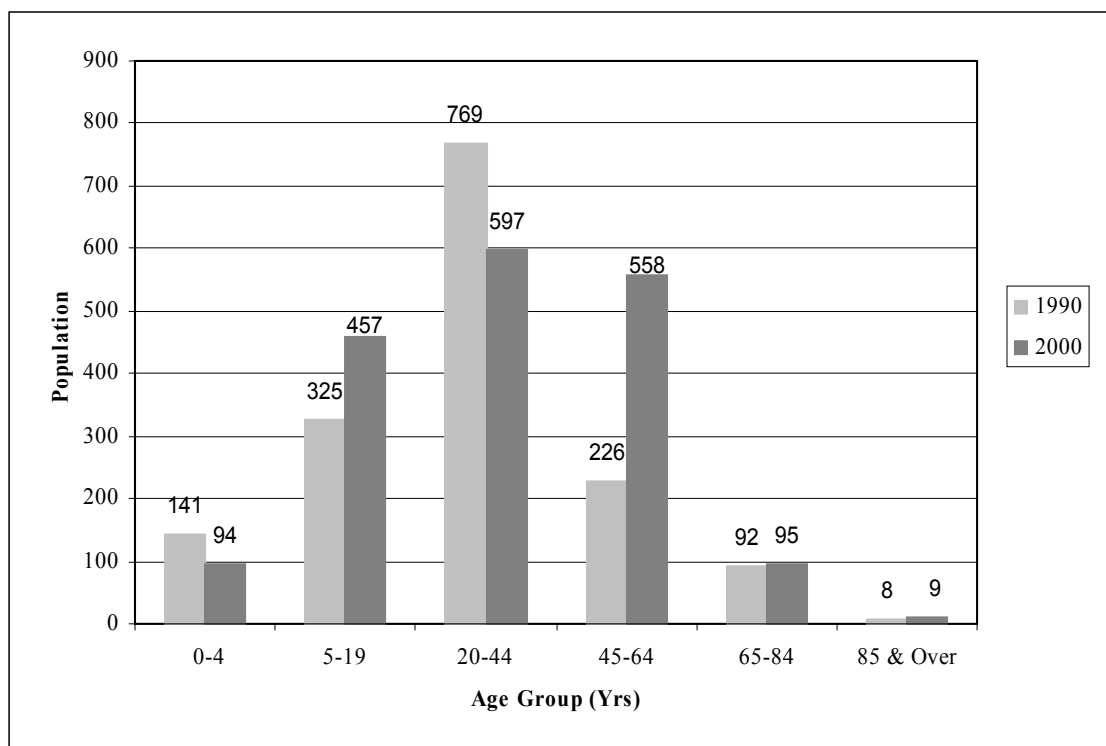
Population Distribution by Age Group

In planning for future residential development, it is essential to understand how the characteristics and age distribution of the population are expected to change over time. Knowledge of these population attributes will help identify what types of housing will best address residents' future housing needs. Two population groups that may have special housing needs and that may have the most difficulty finding suitable, affordable housing are the elderly (typically defined by demographers as those people ages 65 and over) and families with young

children. Currently, 45 percent of Shutesbury households (equal to 296 households) include children under 18 years of age (2000 U.S. Census).

The elderly and families with young children can benefit from housing with good access to services, including stores, health care, and community facilities and programs. Also, the elderly, particularly the oldest elderly (defined as people 85 years old or above), may need housing with features or modifications that increase accessibility and functionality for people with limited mobility or other disabilities. According to the 2000 U.S. Census, almost 30 percent (28.4%) of Shutesbury residents 65 and over have a disability, compared to 8 percent of the population overall. Most of the people aged 65 and over with disabilities have a disability which limits their basic physical activities, such as walking, reaching, lifting, carrying, or climbing stairs, and their ability to travel outside of their homes by themselves.

Figure 3-1: Population Distribution by Age Group in Shutesbury, 1990 and 2000



Source: U.S. Census Bureau, Census of Population and Housing, 1990 and 2000.

The population distribution for Shutesbury in 1990 and 2000 is shown in Figure 3-1. Table 3- shows the population distribution figures for Shutesbury, Franklin County, and the State for the same years. The information on the town’s population by age group comes from the last two decennial U.S. Censuses.

According to the U.S. Census data for 1990 and 2000, the population percentages in Shutesbury for many of the listed age groups (*see Table 3-10*) are close to the population distributions for Franklin County and Massachusetts as a whole. However, there are a few differences. For example, in both 1990 and 2000, Shutesbury had a lower percentage of residents ages 65 and

over, than did the County or State, and a higher level of 5-19 year olds. Also, in 2000, Shutesbury had a higher percentage of people ages 45-64 than Franklin County or Massachusetts overall. Some of Shutesbury's differences likely reflect the growing number of households with children in town, compared to the larger areas, and the number of families moving to Shutesbury. As was mentioned earlier, during the 1990s, the number of households in Shutesbury with children under 18 grew by 20 percent, while in Franklin County overall, the number of these households decreased by 3 percent.

Table 3-10: Population Distribution in Shutesbury, 1990 and 2000, Comparison to County and State

Age Group	Population Distribution (% of total population in each age group)					
	1990			2000		
	Shutesbury	Franklin County	State	Shutesbury	Franklin County	State
Under 5 Years	9.0%	7.3%	7.0%	5.2%	5.2%	6.3%
5-19 Years	20.8%	19.8%	18.9%	25.2%	20.7%	20.1%
20-44 Years	49.3%	40.9%	42.1%	33.0%	34.0%	37.7%
45-64 Years	14.5%	17.5%	18.4%	30.8%	25.9%	22.4%
65-84 Years	5.9%	12.8%	12.0%	5.2%	12.3%	11.7%
85 Years & Over	0.5%	1.6%	1.5%	0.5%	1.9%	1.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Sources: U.S. Census Bureau, Census of Population and Housing, 1990 and 2000.

Between 1990 and 2000, some of Shutesbury's age cohorts experienced little change. For example, during that decade, the 65-84 years age group and 85 years and over group changed by three people and one person respectively. For other age cohorts, the population changes were more dramatic. There was a 147 percent increase in the number of 45 to 64 year olds (+332 people). This increase is driven by the aging of the baby boomer generation (born 1946-64), which began turning 45 in 1991. The largest population decreases were in the number of 20 to 44 year olds (-22% or 172 people) and in the number of children under age 5 (-33% or 47 people).

Residents with Disabilities

Residents with Disabilities

The U.S. Census provides basic information on the prevalence of disabilities. Data on disabilities among Shutesbury residents are presented in Table 3-11. The table excludes people living in institutionalized settings, such as group homes or nursing homes (In 2000, Shutesbury had no such residents). Overall, an estimated 15 percent of Shutesbury's population age 5 and over have a disability of some type. Among the elderly population, 75 percent have a disability. The primary disabilities among Shutesbury's elderly are physical and self-care disabilities, which affect mobility. Unfortunately, the U.S. Census provides no qualitative data to determine the relative severity of these disabilities.

A total of ninety-nine cases of disabilities in Shutesbury involve physical limitations, self-care limitations, or both, indicating that roughly between thirty-three and ninety-nine individuals possess disabilities that could potentially require some form of modified or accessible housing. If it is assumed that 20 percent of this population is severely disabled, then the potential demand for accessible housing may range from seven to twenty units. It is probable that a percentage of this population already resides in housing that has been modified to accommodate their needs.

Table 3-11: Disabilities in the Non-Institutionalized Population in Shutesbury, 2000

Age Group	Total Population **	Number with Disabilities	Percent with Disabilities	Types of Disability (Number of people)*			
				Sensory Disability	Physical Disability	Mental Disability	Self-Care Disability
Age 5 to 15	355	18	5.3%	0	3	12	3
Age 16 to 64	1,257	169	13.5%	12	39	26	15
Age 65 & Over	102	76	74.5%	12	21	9	15
Total Age 5 & Over	1,714	263	15.3%	24	63	47	33

*A person can have multiple disabilities and can be counted in more than one disability category.
Sources: U.S. Census Bureau, *Census of Population and Housing, 2000*.

Shutesbury is working to provide accessibility for residents. The town recently completed renovations at the town Hall, which included a lift at the front entrance and an elevator in the rear entrance. In addition, the town is in the process of completing an Americans with Disabilities Act Transition Plan.

Housing Costs and Affordability

This section explores the cost of housing in Shutesbury for renters and owners, and the degree to which housing is affordable to individuals and families of different incomes. One of the main goals of EO418 is to encourage the creation of new affordable housing units for people with low, middle, and moderate incomes. Under EO418, low income households are considered to be those households earning up to 50 percent of the area-wide median income, moderate-income households are those earning up to 80 percent of the area-wide median income, and middle-income households are those earning up to 150 percent of the area-wide median income. The area-wide median income is defined as the median family income in the county where the units are located. For Franklin County, the current median family income is \$48,400.⁵

As was mentioned earlier, housing is generally defined to be “affordable” when households spend no more than 30 percent of their gross income on housing costs. For renters, housing costs include rent and utilities, such as hot water, electricity, and heat. For homeowners, housing costs include mortgage principal, mortgage interest, mortgage insurance, property taxes, and property insurance. Households that spend over 30 percent of their income on housing are considered to be “cost-burdened.”

⁵ As was described earlier, the median family income is the middle family income level for the geographic area, with half of the families earning more than the median income, and half the families earning less.

Data on housing costs shows that housing in Shutesbury is affordable for most residents, but that some residents, such as those with low incomes, may be cost-burdened by their housing expenditures.

Housing Costs

This section presents information on owner and renter housing costs, and costs relative to household income, for Shutesbury. The data discussed here are primarily from the 2000 U.S. Census. The 2000 Census estimated the monthly costs, and costs relative to income, for 438 owner-occupied homes and 95 rental housing units in Shutesbury.

Of the 438 owner-occupied homes with estimated monthly costs, 367 have mortgages and 71 do not. The monthly costs include mortgage payments (if any), property insurance, and property taxes. Homeowner costs can vary considerably depending on whether the home is mortgaged. For example, the median monthly total housing cost for homes without mortgages is \$410, and the median total cost for homes with mortgages is \$1,175, almost three times as great. Similarly, 80 percent of homes without mortgages have monthly costs under \$600, compared to less than 2 percent of mortgaged homes. Over two-thirds (70%) of homeowners with mortgages have expenditures of \$1,000 or more per month (*see Appendix D for more information on housing costs*).

For Shutesbury's rental housing, the median monthly total housing cost is \$814 per month. This is based on the estimated expenditures for 95 rental units. Estimated costs for rental housing in Shutesbury have a wide range, varying from \$150 to \$2,000. Over half (58%) of the units have monthly costs between \$500 and \$1000. Fifteen percent (14 units) have costs under \$500 per month, and 26 percent (25 units) have costs above \$1,000 per month (*see Appendix D for more information*.)

There was concern among Master Planning Committee members that the U.S. Census-reported figures for housing costs in Shutesbury were lower than the actual housing costs experienced by residents. Another concern was the U.S. Census figures do not incorporate other significant housing-related costs including utility costs for homeowners, and the transportation costs related to living in a rural community.

Housing Values

The U.S. Census Bureau gathers data on housing values by asking owners what they believe their homes, including land, to be worth in the current real-estate market. The Appendix contains data on housing values reported for the 1990 and 2000 U.S. Censuses. According to this information, the median value of owner-occupied homes in Shutesbury grew 14 percent between 1990 and 2000, increasing from \$142,300 to \$162,100. As of 2000, 62 percent of the town's owner-occupied homes are valued between \$100,000 and \$200,000. Nine percent are valued under \$100,000, and 7 percent have values of \$300,000 or more. It is worth noting that what owners believe their homes to be worth, and which is what is reported in the U.S. Census results, may or may not reflect what those homes are worth in the current real-estate market.

Residential Sales

The Warren Group collects town-level residential sales data for much of New England on a monthly and annual basis. Its data combine local Assessors' records with its own home sales records. Table 3-12 presents the Warren Group's data on single-family home sales in Shutesbury for each of the last seven years. Data for earlier periods were not readily available.

The sales information shown in Table 3-12 suggests that Shutesbury's real estate market has fluctuated up and down during the 1996-2002 period, in terms of both the number of homes sold and sales prices. For 2002, the median sales price for single-family homes is \$143,500.

Table 3-12: Single-Family Home Sales in Shutesbury, 1996-2002

Year	Single-Family Sales	
	Number Of Sales	Median Sales Price
2002 (through Nov)	20	\$143,500
2001	28	\$172,450
2000	29	\$155,000
1999	33	\$142,500
1998	37	\$130,000
1997	22	\$112,250
1996	18	\$146,500

Source: The Warren Group, Town Statistics, 2002.

It is worth noting that some of the year-to-year variation in sales prices could be related to the types of homes that are sold in an individual year, and is not necessarily reflective of an overall trend. For example, the Franklin County Cooperative Inspection Program records on building permits for Shutesbury show that in recent years, there have been a number of new construction permits granted for the building of modular single-family homes. Another factor is that more two-family homes have been constructed in recent years (*see Table 3-3*).

Housing Affordability

This section assesses Shutesbury's housing prices and costs in terms of how affordable housing is for residents, based on household income. Housing is generally defined to be "affordable" when households spend no more than 30 percent of their gross income on housing costs.

Number of Low, Moderate, and Middle-Income Households

The first step in assessing housing affordability in Shutesbury involves estimating the number of low, moderate, and middle-income households that reside in the town. Under EO418, low income households are considered to be those making 50 percent or less of the area-wide median income, moderate-income households are those making up to 80 percent of the area-wide median income, and middle-income households are those making up to 150 percent of the area-wide median income. The area-wide median income is defined as the median family income in the county where the housing units are located. For Fiscal Year (FY) 2004, the median income used for Shutesbury EO418 housing certification, and that of most other Franklin County towns, is \$48,400.⁶

With this median income level, low-income households are considered to be those households earning \$24,200 or less. Moderate-income households earn between \$24,200 and \$38,700, middle-income households earn between \$38,700 and \$72,600, and upper income households earn \$72,600 or more.

Table 3-13: Households by Income Level, by Householder Age, in Shutesbury, 1999

Income Level	Total		Age of Householder							
			Under Age 25		Age 25 to 44		Age 45 to 64		Age 65+	
	#	%	#	%	#	%	#	%	#	%
Low Income (\$24,999 or less)	87	13.2%	4	28.6%	28	10.9%	33	10.2%	22	33.8%
Moderate Income (\$25,000 to \$39,999)	97	14.7%	6	42.8%	46	17.8%	35	10.8%	10	15.4%
Middle Income (\$40,000 to \$74,999)	238	36.0%	2	14.3%	110	42.6%	116	35.8%	10	15.4%
Upper Income (\$75,000 or above)	239	36.2%	2	14.3%	74	28.7%	140	43.2%	23	35.4%
Total	661	100.0%	14	100.0%	258	100.0%	324	100.0%	65	100.0%

Sources: U.S. Census Bureau, Census of Population and Housing, 2000.

Table 3-13 estimates the number of Shutesbury households in each income category, based on the incomes reported in the 2000 U.S. Census. Based on the definitions above, it is estimated that 13 percent of Shutesbury households are low income, 15 percent are moderate income, and 36 percent are middle income.

Typically, low-income status is the most prevalent among young households and elderly households. Almost 34 percent of the Shutesbury households where the householder (head of household) is age 65 or older, and 29 percent of householders in the under age 25 group, have incomes under \$25,000. In the middle and elderly age groups, the majority of households are either middle or upper income. Overall, 36 percent of Shutesbury households are in the upper income bracket, and 36 percent are in middle-income bracket.

⁶The only Franklin County town with a different median income for housing certification is Sunderland. Sunderland is considered part of the Springfield metropolitan region for EO418 Housing Certification purposes. That region has a slightly higher median income (\$50,700) and therefore, slightly higher affordability thresholds for certification.

Affordability of Home Ownership for Low, Moderate, and Middle-Income Households

One important measure of housing affordability is the purchasing power for prospective first-time homebuyers, who are currently renting in the community. According to the 2000 Census approximately 84 percent of rental households in Shutesbury are of low, moderate, or middle income, and earn under \$75,000 gross income annually (\$6,250 per month).

A middle-income household earning \$60,000 per year (equivalent to \$5,000 per month), can afford up to \$1,500 per month in housing costs. With the following assumptions (see below) regarding a potential home purchase, a household with an income of \$5,000 per month could afford to buy a house valued at up to \$185,000.

Assumptions:

- The home will be bought with a 30-year mortgage at 6 percent;
- 10 percent of the purchase price will be paid as a down payment;
- Annual property taxes and property insurance costs will equal 1.65 percent of the house value (tax rate of 1.5% (\$15/\$1,000 valuation) and property insurance rate of 0.15%);
- Mortgage insurance costs will equal 0.7 percent of the borrowed principal; and
- Utilities will cost approximately \$150 per month.

According to the 2000 U.S. Census, 59.2 percent of homes in Shutesbury have values under \$175,000, and are affordable to middle-income households.

A household of moderate income earning \$30,000 annually (\$2,500 per month) can also find homes that are affordable in Shutesbury, though they are less common. A household with a \$30,000 annual income can afford to spend approximately \$750 per month on housing costs. Using the same assumptions as above, such a household could afford to buy a home valued at \$83,000 or less. According to the 2000 Census, 4 percent of homes (20 homes) in Shutesbury have values below \$80,000 and 6 percent (32) have values below \$90,000.

Median Housing Costs

Table 3-14 reviews the median monthly housing costs for households in Shutesbury, Franklin County, and Massachusetts overall, based on tenancy. The data come from 2000 U.S. Census. As of 2000, the median monthly housing costs for Shutesbury households total \$1,175 for homeowners with a mortgage, \$410 for homeowners without a mortgage, and \$814 for renters. On average, these housing costs represent 23 percent of gross household income for owners with a mortgage, 10 percent of household income for owners without a mortgage, and 28 percent of income for renters.

These percentages are all below 30 percent, the general threshold for affordability. This indicates that most Shutesbury households, both renters and homeowners, have housing that is affordable based on their incomes, and are not cost-burdened by their housing expenditures.

Table 3-14: Median Housing Costs as a Percentage of Gross Income for Shutesbury, 2000, Comparison to the County and State

Area	<u>For owners with mortgage</u>		<u>For owners without mortgage</u>		<u>For renters</u>	
	Median Monthly Costs	Median % of Income Spent on Housing	Median Monthly Costs	Median % of Income Spent on Housing	Median Monthly Costs	Median % of Income Spent on Housing
Shutesbury	\$1,175	22.7%	\$410	10.0%	\$814	27.5%
Franklin County	\$978	21.7%	\$336	12.2%	\$541	26.1%
Massachusetts	\$1,353	21.9%	\$406	12.4%	\$684	25.5%

Source: U.S. Census Bureau, Census of Population and Housing, 2000.

A comparison of Shutesbury's median housing costs with those for Franklin County and Massachusetts as a whole show that although the median housing costs vary among Shutesbury, Franklin County, and the State, in general, the median percent of household income spent on housing stays roughly constant. Shutesbury shows only minor differences from the County and State. For example, renters and homeowners with mortgages spend slightly high portions of their incomes than the average. For Shutesbury residents, and those hoping to move to Shutesbury, a larger issue than housing affordability is likely housing availability. The homeowner vacancy rate stands at 1.8 percent and the rental vacancy at 1.7 percent.

Housing Costs Compared to Incomes by Income Bracket

Although housing in Shutesbury is affordable for most residents, a percentage of residents in low and moderate-income brackets, especially homeowners, are cost-burdened by their housing costs.

Based on the 2000 U.S. Census data, low-income households have the highest rates of burdensome housing costs. Low-income households are considered to be those households, which earn less than 50 percent of the area median family income, equal to \$24,200 for Franklin County for FY 2003. Of the forty-two combined renter and homeowner households with incomes under \$20,000 and known housing costs, all spend at least 35 percent of their incomes on housing. It is believed that many of the cost-burdened low-income renter households are college students paying high rents per person.

Moderate-income households are those households that earn between 50 and 80 percent of the area-wide median family income. For FY 2003, 80 percent of the median family income is \$38,720. In Shutesbury, among households earning \$20,000 to \$34,999 per year, 63 percent of homeowners and 58 percent of renters spend 30 percent or more of their incomes on housing.

In contrast, among households earning \$50,000 or more, only 6 percent have housing costs above the 30 percent affordability threshold. All of these households owned their homes, and based on the homeowner housing cost information provided in Appendix D, probably had large mortgages.

In Shutesbury, there are a small but significant number of households who expend more than 50 percent of their incomes in housing. These households are considered to be severely cost-burdened by their housing expenditures. In Shutesbury, the severely cost-burdened group

includes at least twenty-eight homeowners with mortgages, four homeowners without mortgages, and eighteen renters. Combined, these groups account for at least fifty households, comprising 8 percent of all households in Shutesbury with cost and income data. Most of the severely cost burdened households likely have fixed or limited incomes, and as a result, have experienced difficulties as housing costs have risen. Households that are severely cost-burdened by housing expenditures may find themselves with little money left over to pay for other necessities, including food, health care, transportation, and home maintenance costs.

Housing Costs Compared to Incomes by Age Group

The 2000 U.S. Census estimated housing costs relative to income for 529 (80%) of the town's households. Of those households with cost and income data, 101 homeowner households (23%) and forty-five rental households (46%) spent 30 percent or more of their incomes on housing. Combining renters and homeowners, it is estimated that 27 percent of all Shutesbury households have burdensome housing costs.

The Census data indicate that low, moderate and middle-income households in Shutesbury have higher rates of burdensome housing costs, compared to higher income households. The Census Bureau also collects data on housing expenditures as a percentage of income, by age group. Table 3-15 summarizes this information for Shutesbury. The table shows that for owners and renters, the 35-54 age group has the greatest number of householders with burdensome housing costs (71% of owners and 54% of renters). However, the groups of householders with the highest rates of burdensome housing costs among owners are under 35 years of age and among renters, they are over 55, though this latter, renter group represents only 12 percent of the total number of cost-burdened renter households and only 4 percent of all cost-burdened households.

Table 3-15: Percentage of Income Spent on Housing Costs, by Householder Age, 1999

Tenancy and Householder Age	Households with Cost Data*	Housing Costs as a Percentage of Household Income (Number of Households)				Total Households with Unaffordable Housing (Housing Costs are 30%+ of Income)	
		Under 25%	25-29%	30-34%	35% or More	# of Households	% for Age Group*
Owners							
Under Age 35	30	15	3	2	10	12	40%
Age 35 to 54	317	208	37	18	54	72	23%
Age 55 to 64	61	42	6	3	10	13	21%
Age 65 or Over	28	20	4	0	4	4	14%
Total for Owners	436	285	50	23	78	101	23%
Renters							
Under Age 35	44	21	9	0	14	14	32%
Age 35 to 54	44	20	2	8	14	22	50%
Age 55 to 64	2	0	0	0	2	2	100%
Age 65 or Over	3	0	0	0	3	3	100%
Total for Renters	93	41	11	8	33	41	46%

Percentages are calculated based on the total number of households in each income category with cost percentage data. Source: U.S. Census Bureau, Census of Population and Housing, 2000.

Overall, the available data shows that housing in Shutesbury is affordable for most residents. At the same time, however, it is also true that a significant proportion (27%) of households have unaffordable housing costs when comparing median housing costs to gross income. Of this group, slightly more than a third are severely cost-burdened, using over half their incomes on housing. It is important that these households have sufficient options and opportunities to decrease their relative housing costs, including better employment opportunities for those people who want to work full-time, but who are presently under-employed. The Town of Shutesbury can work to assist residents who are currently cost-burdened by housing costs by creating new affordable housing options and opportunities.

One major factor contributing to burdensome housing costs for low and moderate-income households are increasing property taxes. Between 1990 and 2002, the average annual property tax for a single-family home in Shutesbury increased almost \$1,700 (113%), from \$1,494 (1990) to \$3,184 (2002). During the same time period, the median annual property tax for single-family homes statewide grew \$1,073, from \$1,504 (1990) to \$2,577 (2002). For Shutesbury residents, an average annual property tax of \$3,184 is equivalent to \$265 per month. For low-income residents in Shutesbury and elsewhere, the increasing amount of incomes spent on property taxes, along with other rising housing costs, threatens the affordability of their current housing options.

The Town of Shutesbury is committed to addressing housing needs in the community and to assisting its cost-burdened low, moderate, and middle-income residents. The Town of Shutesbury participates in regional initiatives to support affordable housing including the

housing rehabilitation program (administered by HRA) for low and moderate-income homeowners. Households in the younger age group (under 35) could benefit from more housing choices, including more rental opportunities and programs to assist first-time homebuyers as well as more affordable homeowner units.

Affordable Housing under EO418

Under Executive Order 418 (EO418) and its housing certification process, towns need to demonstrate that they are working to increase their supply of housing that is affordable to community residents and to address the community’s housing needs. Towns must obtain housing certification to be eligible to receive funds through certain discretionary rolling grant programs, and to receive bonus rating points for other grant programs. The affected programs are administered by the Department of Housing and Community Development (DHCD), the Executive Office of Environmental Affairs (EOEA), the Department of Economic Development (DED), and the Executive Office of Transportation and Construction (EOTC).

Housing units that count as “affordable housing” for EO418’s housing certification include both owner-occupied housing and rental housing. Qualifying rental units for housing certification must be affordable to families earning 100 percent of the area-wide median income, and qualifying homeownership units must be affordable to families earning 150 percent of the area-wide median income. The area-wide median income is defined as the median family income in the county where the units are located. Distinctions may be made between rural and non-rural areas for the median income calculation, though no such distinctions are made in Franklin County. The median income used for Shutesbury’s housing certification, and for the certification of all other towns in Franklin County, for Fiscal Year (FY) 2003 is \$48,400. For comparison, Shutesbury’s median household income reported in the 2000 U.S. Census is \$60,437. Housing is considered affordable if families at the above area-wide median income levels spend no more than 30 percent of their incomes on housing expenditures.

Table 3-16: Affordable Housing Rents and Purchase Prices under Executive Order 418 for Franklin County, FY 2003

Area Median Family Income (Franklin County)	\$48,400
150% of Area Median Family Income	\$72,600
Affordable Homeowner Units	
Home Price Affordable for Middle-Income Households (150% of Median Family Income)	\$228,927
Affordable Rental Units	
Monthly Rents Affordable for Middle-Income Households (100% of Median Family Income)	\$1,210

Source: Massachusetts Department of Housing and Community Development, Instructions for Completion of FY 2003 Request for Housing Certification, 2002.

Table 3-16 displays the affordable rent and home purchase prices for Franklin County according to EO418 documentation for FY 2003, which began July 1, 2002. As the table shows, to count for Shutesbury’s housing certification, rental units must have rents and utilities totaling no more

than \$1,210 per month, and ownership units must be valued at \$228,927 or less. Most of Shutesbury's housing is considered affordable under these definitions. According to the 2000 U.S. Census data on housing costs (*provided in Appendix D*), only 26 percent of rental units in Shutesbury have monthly costs of \$1,000 or more. Similarly, only 29 percent of the town's owner-occupied homes have housing values above \$200,000. In fiscal year 2003, the Town of Shutesbury added three new single-family units and two duplexes. The single-family units were valued by the Assessors to be between \$88,200 and \$170,200, and the duplexes were valued from \$229,700 to \$236,000.

Affordable Housing under Chapter 40B

Chapter 40B of the Massachusetts General Laws (established in 1969) was the State's first major legislation to promote affordable housing and encouraged towns to increase their amount of affordable housing to 10 percent of their total housing units. The Chapter 40B definition of "affordable housing" is more restrictive than the general definition based on housing costs not exceeding 30 percent of household income. In determining a town's total number of affordable housing units for Chapter 40B, the State has historically only included long-term affordable housing units that receive direct subsidies through State or Federal housing assistance programs, and excluded all unsubsidized units, even if their monthly costs are less than 30 percent of the median household income. This restriction is a disadvantage to rural communities where subsidized housing is less likely to be developed, but where housing costs relative to income may be lower than in more urban places. Using the Chapter 40B definition of "affordable," the Massachusetts Department of Housing and Community Development (DHCD) estimates Shutesbury has no units of affordable housing as of 2001.

Table 3-17 gives the percentage of housing in each of the neighboring towns around Shutesbury that is affordable according to Chapter 40B. Three of Shutesbury's neighbors, Leverett, New Salem, and Pelham, also have no affordable housing units under Chapter 40B. The two remaining towns, Amherst and Wendell, both have over 10 percent, though questions have arisen recently about Wendell's percentage of Chapter 40B housing, and the State may revise Wendell's Chapter 40B housing counts downward.

One reason that the percentages in Table 3-17 are so low for most of the towns, is because the definition of "affordable housing" under Chapter 40B has been so limited, not because the towns lack housing that is affordable for residents. As discussed earlier, according to the 2000 U.S. Census, close to three-quarters of Shutesbury households (73%) spend less than 30 percent of their incomes on housing, the general definition of affordability.

Table 3-17: Residential Units in Shutesbury and Neighboring Towns that Count as Affordable under Chapter 40B, 2001

Town	Year-Round Housing Units	Ch 40B Affordable Housing Units*	Percent of Units that are Affordable, Ch. 40B Definition
Shutesbury	680	0	0.0%
Leverett	642	0	0.0%
New Salem	399	0	0.0%
Wendell	405	77**	19.0%
Amherst	9,020	951	10.5%
Pelham	551	0	0.0%

*Count as of October 1, 2001.

**As was mentioned earlier, the State may revise its count of Chapter 40B affordable housing in Wendell, which could put Wendell below the 10 percent level.

Source: MA Department of Housing and Community Development, 2002.

As mentioned earlier, the State has recently begun to revise Chapter 40B and to expand its definition of “affordable housing.” Among the units which can now count as affordable and towards the State’s 10 percent mandate are locally subsidized housing units, long-term housing for the mentally ill or mentally retarded, housing created through the Community Preservation Act (M.G.L. Chapter 44B), and accessory apartments constructed after June 30, 2002. These types of housing all now count as affordable as long as they are serving low and moderate-income residents.

Under Chapter 40B’s expanded definition of “affordable housing” and with the town’s recent housing initiatives, it will be easier for Shutesbury to have housing units that count as long-term affordable according to Chapter 40B. Unfortunately, the recent RDI constructed home does not count as “affordable” under the Chapter 40B definition, because there is no restriction on the home to guarantee that the home will only be for low and moderate-income households for at least 30 years. If such as restriction was in place, then the unit would count towards Chapter 40B’s affordable housing totals.

Population Projections and Future Housing Demand

MISER Population Projections

Population projections for all Massachusetts towns are developed by the Massachusetts Institute of Social and Economic Research (MISER). MISER, located at the University of Massachusetts, serves as the U.S. Census Bureau’s main data center for the Commonwealth. MISER’s latest projections (1999) forecast population levels out through 2010. In forecasting future populations, MISER develops population projections by age and race for each town in the State. In its population forecasts, MISER creates low, middle, and high projections, each with slightly different assumptions.

MISER’s projections for Shutesbury for 2000 and 2010 are shown in Table 3-18. Shutesbury’s population for 2000 estimated by the U.S. Census was 1,810. None of MISER’s projections

(low, middle, or high) for 2010 seem very accurate for Shutesbury. It is most likely that Shutesbury’s population will continue to increase between now and then, but that the growth will be limited. No such scenario is suggested by MISER.

Table 3-18: MISER Population Projections for Shutesbury, 2000 & 2010

	Total Population 2000	Total Population 2010	Population Change (%) 2000-2010
Low Projection	1,729	1,489	-13.9%
Middle Projection	2,179	2,937	34.8%
High Projection	2,684	5,410	101.6%

Source: MISER, Population Projections for the Years, 2000, 2005, and 2010, released 1999.

MISER’s projections shown here relied heavily on data from the 1990 U.S. Census, and intermediary population estimates produced from 1990 to 1999 prior to the 2000 U.S. Census. MISER will be updating its projections over the next few years to reflect information gathered during the 2000 Census. The new MISER forecasts, which will likely extend out to 2025, could potentially show different trends than those suggested by the current projections (1999), and could be more useful in predicting Shutesbury’s future growth and demographic changes.

FRCOG Population Projections

The Franklin Regional Council of Governments has developed its own population projections out to 2025, as part of its 2003 Regional Transportation Plan. These population projections are based on historic trends for the 1970 to 2000 period, using U.S. Census data. For communities such as Shutesbury, which experienced tremendous growth during the 1970s and 1980s, the forecasts are based on the population changes from 1990 to 2000. The population projections estimate that by 2025, Shutesbury’s population may grow to approximately 2,600, adding approximately 800 new year-round residents over its current (2000) population of 1,810.

Future Housing Demand

Assuming an average household size of 2.5 people per household, the 800 additional people would comprise 320 households, each of which would need housing. Though some of the new population could be accommodated in existing homes, for example, converted seasonal residences, it is still likely that most of the population growth would be accommodated with new construction. As shown in Table 3-3, from 2000 to 2002, the Franklin County Cooperative Inspection Program issued building permits for twenty-four new dwelling units, leaving approximately 300 additional units needed. It is important to mention that 1) Shutesbury currently has a Rate of Development By-law, which limits residential new construction to six units per year, 2) the average annual rate of issuance for new-unit permits per year for the decade 1993-2002 is equal to seven permits, and 3) the town is considering a phased growth by-law that would seek to maintain the number of new permits issued per year to be consistent with that historical trend. Allowing for the issuance of permits for seven new dwelling units per year for the period 2007-2025 and six for the period 2002-2006 could provide up to 157 new residential units, less than the 300 housing units projected earlier. It is possible that the new construction

limit could be increased over time to accommodate growth pressures. Another possibility is that growth pressures combined with the strict new construction limit could lead to a high rate of conversion of currently seasonal residences to year-round occupancy.

In addition, by 2025, the number of elderly residents (65 years+) in Shutesbury is forecasted to stand at almost 271 a projected increase of 160 percent of the 2000 figure. Assuming that, on average, an elderly household consists of two people, the 271 elderly residents forecasted for 2025 will make up 136 households. Assuming further that one-quarter of these households may be interested in traditional senior housing, there may be a demand for up to 34 senior housing units by 2025.

Based on the information that has been gathered on Shutesbury's current housing conditions and affordability, the following primary housing assets and issues have been identified:

Assets

- High level of homeownership. Overall 83 percent of Shutesbury's occupied housing units are owner-occupied. A high level of homeownership adds to Shutesbury's sense of community and increases residents' commitment to the town and its future.
- Diversity of housing. Shutesbury's housing stock contains a range of housing types, including single-family homes, duplexes, multi-unit structures and mobile homes. There is also a mix of renter and homeowner units, with rental units accounting for 14 percent of all housing. In addition, homes around Lake Wyola offer provide housing at a greater density than is found in other areas of town.

The primary population in Shutesbury with identified housing needs includes the town's seniors who wish to continue living in Shutesbury as they get older, but who are not sure that they will be able to. In addition, householders under 35 years of age in the low to moderate-income brackets, might benefit from a decrease in housing costs or an increase in their annual incomes. Despite the fact that new homes being built in Shutesbury are "affordable," more than one fifth of all middle-aged homeowners (35-54) spend more than 30 percent of their incomes on housing.

Primary Housing Issues

The key housing issues for cost-burdened homeowners in Shutesbury are the following:

- Rising property taxes. Rising property taxes are making it difficult for seniors and other on fixed and limited incomes to continue to live in Shutesbury. Between 1990 and 2002, the average annual property taxes for a single-family home in Shutesbury increased almost \$1,700 (113%), from \$1,494 (1990) to \$3,184 (2002). An average annual property tax of \$3,184 is equivalent to \$265 per month. For Shutesbury residents with low to moderate incomes, the increasing percentage of their income spent on property taxes threatens the affordability of their housing.

This is an issue particularly for older seniors in Shutesbury. The median household income overall in Shutesbury is \$65,521. Where the head of the household is 75 years in age or older, the median household income is \$21,250. The U.S. Census estimates that there are 31 such households in Shutesbury. At that income level, a household can only afford monthly housing costs of \$531 or less.

- Need for accessibility improvements. Some seniors need home renovations to improve the accessibility and safety of their homes, so that they are able to remain in them as they age. One potential funding source for seniors is the housing rehabilitation loan program administered by the Franklin County Housing and Redevelopment Authority (HRA). In FY2002, HRA received \$140,000 to use for housing rehabilitation projects in Shutesbury. HRA estimates that these monies will provide sufficient funds to rehabilitate six to eight homes. Projects can include accessibility improvements. Low and moderate-income families, both seniors and non-seniors, are eligible to apply for this program. However, the amount of funds available may be insufficient to meet demand. Also, there are some seniors whose incomes are above the program thresholds, but who still can't afford to make home repairs and improvements.
- Need for dedicated senior housing. It is projected that Shutesbury's elderly population, aged 65 and over, will more than double between 2000 and 2025, growing from 104 (2000) to over 250 (2025). It is important to have suitable and affordable housing options, such as senior housing, for this growing population segment. There is demand among Shutesbury residents, as expressed in the earlier presented goals and objectives for "fair, decent, safe, affordable senior housing that meets the needs of Shutesbury's seniors." It may not be feasible for some residents to stay in their homes as they get older. A senior housing development would provide an affordable, accessible, lower-maintenance housing option compared to single-family homes. Senior housing could also count towards the State's 10 percent affordable housing goal under Chapter 40B if it is for low and moderate income seniors.
- Proximity to services. Shutesbury residents typically leave Shutesbury for most of their shopping and service needs, including medical services. For seniors and elderly residents, it can become more difficult to travel outside of the community, particularly if they no longer drive. As a result, some senior residents decide to leave Shutesbury as they get older. More retail and other businesses in Shutesbury could benefit residents overall, including seniors, and would also contribute to the town's tax base. Additional public transportation services would also be helpful. Both changes have support among residents, and are included in the Shutesbury's statement of Town Goals and Objectives, developed for the Master Plan.

Another key issue, which has been identified for housing in Shutesbury is the need to balance future residential development with the protection of valued, natural, scenic, and historic resources, as well as with anticipated municipal costs.

Quantifying Shutesbury’s Housing Needs

Earlier in this chapter, there was an evaluation to estimate the percentage of income spent on housing costs, for different income and age groups, and to determine the number of low, moderate, and middle-income households in Shutesbury with unaffordable housing costs. Table 3-19 summarizes the findings of this analysis.

Table 3-19: Current Estimates of Low, Moderate, and Middle-Income Households with Affordability Needs, by Age and Tenure, 1999

Household Types	Low Income	Moderate Income	Middle Income	All Income Eligible Households EO418
Number of Households with Housing Cost Data				
Homeowners	36	50	180	266
Renters	29	23	26	78
Total	65	73	206	344
Elderly Households with Affordability Needs				
Homeowners	4	0	0	4
Renters	3	0	0	3
Total	7	0	0	7
Non-Elderly Households with Affordability Needs				
Homeowners	28	27	40	95
Renters	22	12	4	38
Total	50	39	44	133
Total Homeowners with Affordability Needs	32	27	40	99
Total Renters with Affordability Needs	25	12	4	41
Total Households with Affordability Needs	57	39	44	140

Estimates prepared by FRCOG. The estimates are based on data from the 2000 U.S. Census, Summary File 3.

Shutesbury has a total of 344 low, moderate, and middle-income households with housing cost data. An estimated 140 of these households have burdensome housing costs. These burdened households include fifty-seven low-income households, thirty-nine moderate-income households, and forty-four middle-income households. As the table shows, the percentage of renters and homeowners with affordability issues varies among income groups:

- Most (61%) rental households with affordability needs are low income; and,
- Two/fifths of homeowners with affordability needs are middle-income earners (\$40,000-\$74,999).

Potential Locations for Future Residential Development

The Shutesbury Master Plan identifies areas of town that are experiencing new development. The Master Plan also identifies areas that contain critical environmental and recreational resources like Outstanding Resource Waters, BioMap Core Habitats, and large blocks of

contiguous forest as well as strategies for their conservation. This section of the Housing chapter seeks to describe potential areas of town where development might be encouraged of the types described and promoted in the recommendations of this chapter. The foldout Land Use Suitability Map at the end of this section and the last element of Appendix D describe the methodology used to identify the potential developable areas in Shutesbury (*see Land Use Suitability Map*).

The Master Planning Committee in conjunction with the Shutesbury Planning Board has identified potential locations for new development in Shutesbury. The five-step method used to identify potential developable areas begins by removing from view all lands containing absolute development constraints (slope >25%, wetlands, Rivers Protection Act zones, protected open space, public water supplies, rare species habitats, etc.) and taking into consideration areas with partial constraints to development (15-25% slope, aquifers, and Interim Wellhead Protections Areas, etc.). The third step removes all lands that are already developed while the fourth step identifies those areas that are potentially developable (does not include the partial constraints). The fifth step involves an assessment of potential developable lands while taking into consideration other specific criteria as identified throughout the Master Plan.

From the potentially developable lands shown on the Land Use Suitability Map, additional criteria have been chosen to identify the areas, which the Master Planning Committee feels could potentially be most suitable for focusing future residential development. These criteria include:

- Areas not within the proposed Rural Conservation Overlay District or the proposed Water Supply Protection Overlay District (*see Land Use Suitability Map*); and
- Locations near current services and civic/public activities.

Beyond the current main development pattern of ANR lots on main roads in town, and the conversion of seasonal to year-round units at Lake Wyola, two potential areas for future residential development include a 100-acre area southwest of the Elementary School and two forty-acre areas south and northeast of the Town Hall. All three locations might be appropriate for locating a small 5-7 unit senior housing facility as well as supporting lots of ½-acre to 1 acre in size and smaller frontages.

Recommendations

These recommendations are proposed to help address Shutesbury's housing issues, especially for the identified short and long-term population Shutesbury with housing needs: seniors, especially those with limited incomes. These recommendations are also intended to help achieve the goals and objectives discussed earlier.

Short-Term Strategies

- Promote the housing rehabilitation loan program among residents, especially seniors, with low and moderate-incomes who do not have the financial resources to fund home improvements and repairs on their own, including accessibility improvements, septic system upgrades, and radon, asbestos, and UFFI mitigation. Use the housing rehabilitation loan program to help maintain and preserve Shutesbury's current affordable housing stock.
- Pursue public grants and other funding sources to encourage the development of affordable housing for seniors, at an appropriate scale for the community. Work with HRA to access these potential funds.
- Review the town's zoning ordinances and consider changes that could encourage more housing options for seniors, including accessory apartments and senior housing.
- Continue to investigate which parts of town may be the most suitable for new housing development, such as senior housing or affordable housing combined with cluster housing. Encourage future growth to occur in those areas. Consider dividing the town's one zoning district into different districts, which would allow different levels of housing development and density as appropriate.
- Consider revising the town's zoning ordinances to include overlay districts that protect sensitive environmental, scenic, and historic areas from residential development patterns that could be detrimental to these assets.

Long-Term and On-Going Strategies

- Work with legislators to encourage the State to continue revising Chapter 40B to provide additional flexibility and local control in the creation of long-term affordable housing, and to expand its definition of "affordable."
- Develop additional ways to reduce the housing cost burdens for seniors and other residents on fixed incomes. Such strategies could include allowing residents to volunteer for the town in exchange for a partial abatement of property taxes.

Projected Impacts of These Strategies on Shutesbury's Affordable Housing Supply

This section summarizes the projected impacts of strategies and recommendations, which have been proposed to expand Shutesbury's affordable housing supply. Many of these strategies do not involve the construction of new housing. Rather, they look at potential options for increasing the affordability of the town's current housing stock. These options include housing rehabilitation loans, the creation of accessory apartments in existing homes, and property tax abatements for low-income seniors who volunteer for the town.

Table 3-20: Proposed Strategies to Promote Housing Affordability for Homeowners, and their Potential Impacts over a 10-Year Period

Strategy	Impact of Strategies (number of units impacted over a 10 year period)		
	Low Income Households	Moderate Income Households	Middle Income Households
<i>Total Homeowners with Affordability Needs</i>	<i>32</i>	<i>27</i>	<i>40</i>
Housing Rehabilitation Loan Program Available to low and moderate income households	6-10	6-10	
Income from New Accessory Apartments	4-6	2-4	
Tax-Abatement Program for Low-Income Seniors who Volunteer for the Town	5-10		
New Residential Construction, assuming adoption of a phased growth by-law of approximately 7 units/yr (assumed rate of 6 owner units/year). Includes low and moderate-income affordable single-family homes built through developers such as Rural Development Inc. Estimated 20-25% of new homes for middle-income households Estimated 3-5% of new homes for moderate-income households Estimated 3-5% of new homes for low-income households		2-3	12-15
Total Projected Impact of These Strategies	17-29	10-17	12-15

The proposed strategies to promote housing affordability for homeowners are outlined in Table 3-20, and the strategies to promote affordability for renters are shown in Table 3-21. The strategies will help increase housing affordability for Shutesbury’s low, moderate, and middle-income households who currently face burdensome housing expenditures. These strategies will also help address other concerns of the community regarding recent development patterns and the need to preserve the town’s natural, open space, and historic resources. The strategies presented here focus on using the existing housing stock to the extent possible to meet housing needs, and on directing future growth to particular areas in order to help preserve the town’s rural character. These strategies are presented with the assumption that the “Townwide Rate of Development” by-law, which limits new dwelling permit issuance to no more than six per year, will remain in effect through 2006, and that the town will subsequently adopt a phased growth by-law that will maintain nearly the same level of building permit issuance to seven per year (average number of new dwelling-permits issued per year between 1993-2002).

The potential impacts of these strategies in addressing affordable housing issues are given in the tables below. The potential impacts shown are for a 10-year time period. This time horizon is used to recognize that some years may have less affordable housing creation than other years, and to give the community some flexibility in its strategies to promote housing affordability.

Table 3-21: Proposed Strategies to Promote Housing Affordability for Renters, and their Potential Impacts over a 10-Year Period

Strategy	Impact of Strategies (number of units impacted over a 10 year period)		
	Low Income Households	Moderate Income Households	Middle Income Households
Total Renters with Housing Affordability Needs	25	12	4
First-Time Homebuyer Assistance Programs to Help Rental Households Purchase Homes	2-3	2-3	
New Mixed-Income Senior and Over 50 Rental Housing Complex of 5-7 units, predominantly (75%) for low and moderate income seniors (near Lake Wyola or other location near Amherst or the Town Center)	3-4	2-3	
New Accessory Apartments For Low and Moderate Income Households continuing the building permit rate of 6-7 units/yr (with long-term affordability clauses attached to deed and assuming a rate of up to 1 unit/year)	4-6	2-4	
New Market Rate Rental Homes continuing the building permit rate of 6-7 units/yr (assumed rate of up to 0.5 rental units/ year)			4
Total Projected Impact of These Strategies	9-13	6-10	4

A number of the proposed strategies could help Shutesbury establish housing that counts as affordable under Chapter 40B. For example, accessory apartments, and affordable single-family homes are two types of housing that can count towards the Chapter 40B affordable housing count. To count as affordable housing for Chapter 40B, the units must be for low and moderate-income households and must be guaranteed affordable to these households for at least thirty years. The strategies outlined above could produce up to twenty-three housing units over the next ten years that could count as affordable under Chapter 40B, which would increase the town’s percentage rate from 0.00% to 3.3%.

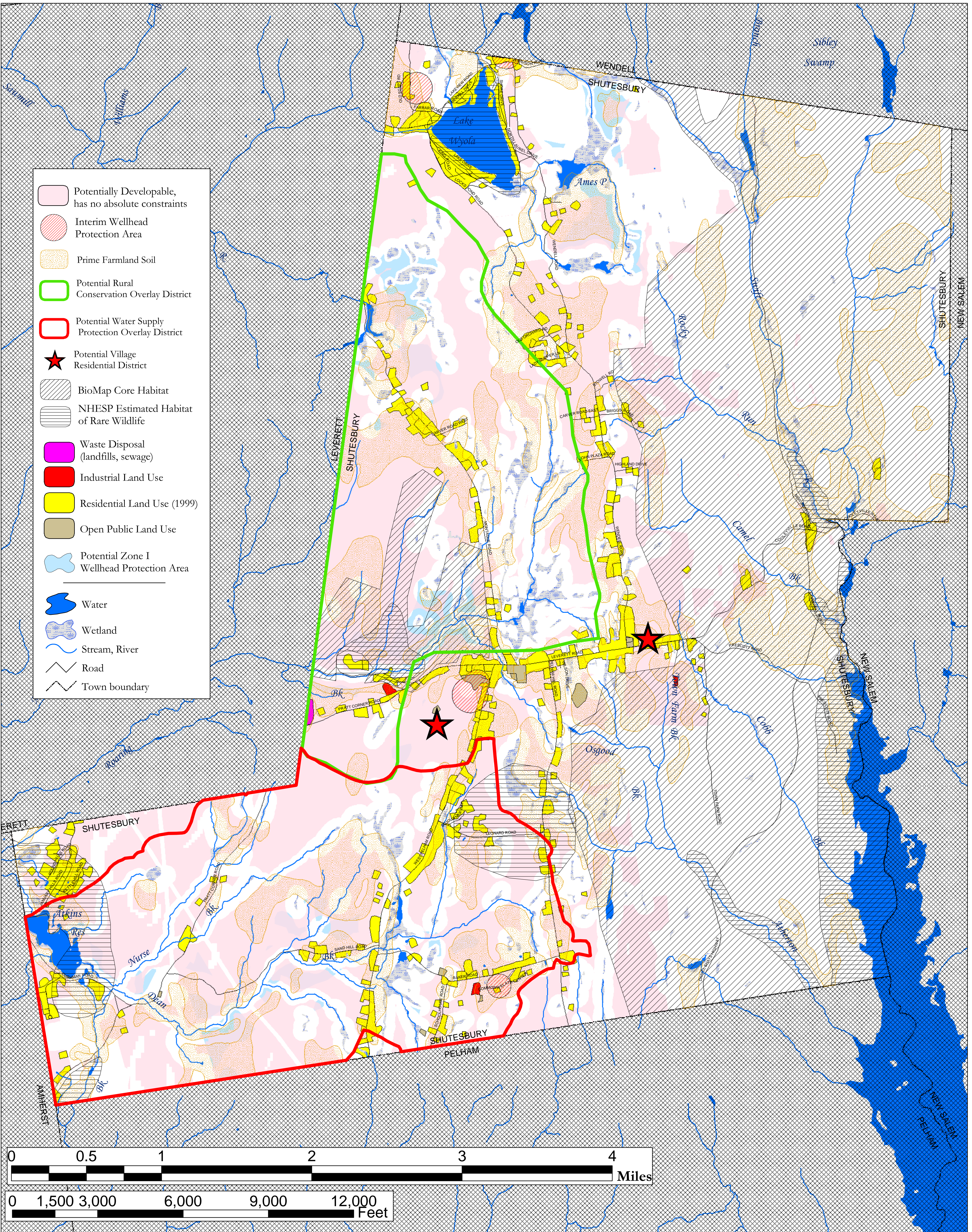
These strategies outlined in the tables above are ambitious, and if implemented, they could significantly reduce the number of Shutesbury households with unaffordable housing. Most of these strategies rely on Shutesbury working with regional organizations such as the Franklin Regional Housing and Redevelopment Authority (HRA). HRA and its partner Rural Development Inc. can assist the town with housing rehabilitation and new affordable housing development, including senior housing, and can help the town fund and leverage funding for these activities.

The proposed strategies presented above are projected to create at least 16 new-owner housing units through market forces and fifteen rental units for low, moderate, and middle-income households in the next ten years. One third of the rental units (7) could be for low and moderate-income seniors; half could be accessory apartments that could potentially count towards the building cap, not require a new structure footprint, and would bring added wealth to low, moderate and middle-income residents. These strategies would still allow for twenty-eight housing units to be built for upper income households earning over \$75,000 per year.

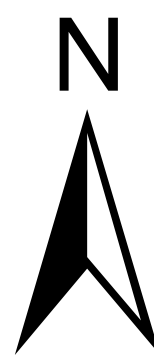
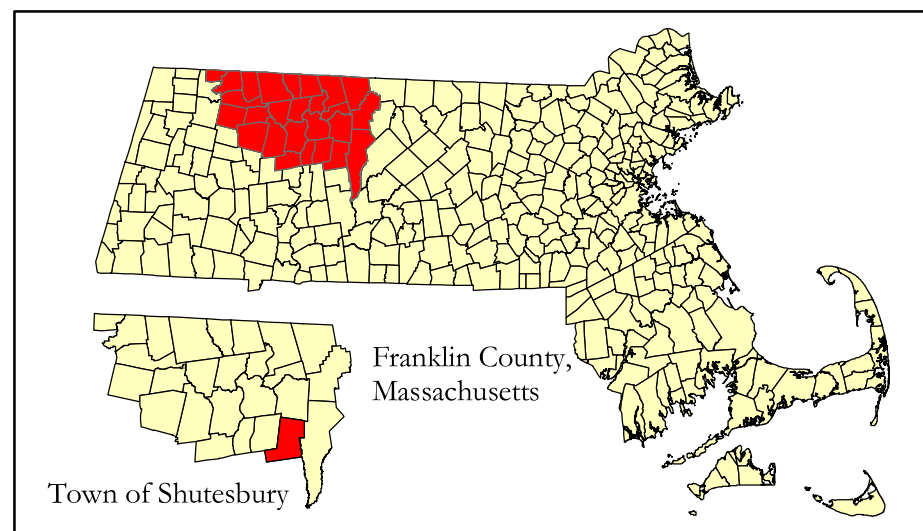
Combined with the proposed ten-year strategies to address housing needs, the town should be able to accommodate the projected housing demand, and help address current community housing issues at the same time. Through its housing strategies and its approach to accommodating future growth, Shutesbury demonstrates its commitment to promoting housing affordability and adequate appropriate housing options for town residents.

Town of Shutesbury Master Plan

Land Use Suitability



FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS
 Main Office: 413-774-3167
 425 Main Street
 Greenfield, Massachusetts 01301



Map Sources:

Map Produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, the Massachusetts Highway Department and MassGIS. Digital Data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. ECEA maintains an ongoing program to record and correct errors in the GIS data that are brought to or as to the implied validity of any uses of the GIS data. ECEA maintains records regarding all methods used to collect and process these digital data and will provide this information on request. Executive Office of Affairs, MassGIS ECDA Data Center, 251 Causeway St., Suite 900, Boston, MA, 017-626-1000.
 Note: Depicted boundaries are approximate and are intended for planning purposes only.

1999 MacCorrel Land Use created by Resource Mapping, Forestry and Wildlife Department, UMASS, Amherst under contract of FRCOG Planning Department. Land use change coverage only signifies polygons that have changed from 1971 - 1999 and do not show what the polygons original use was. This was created by FRCOG planning dept from land use history table Road data provided by Massachusetts Highway Department. Town Line, stream and lake data provided by MASSGIS. Shutesbury wetlands are provided by the National Wetlands Inventory data from US Fish and Wildlife Service and MassGIS 1:5000 orthophoto depiction.

CHAPTER

4

COMMUNITY FACILITIES AND SERVICES

The Town of Shutesbury provides its residents with a host of services including elementary school education, police and fire protection, emergency ambulance service, public library services, highway maintenance, solid and hazardous waste management, and recreational facilities. These programs are funded by residents' property taxes, and state and federal grants and funds. Each of these services is provided via a department or volunteer committee charged with providing a particular level of service based on available funding and need.

The purpose of the Community Facilities and Services Chapter of the Master Plan is to inventory a select set of town facilities and services, identify the most important issues for each, and to recommend strategies that can help ensure adequate provision of services in the future (*see Americans with Disabilities Act (ADA) Transition Plan in the Appendix E*).

More specifically, this chapter reviews the goals and objectives developed from the results of the 2000 Master Plan survey; presents an assessment of the services provided by safety, recreation, and other community departments; explores potential uses and issues relating to the management of other community assets including land and buildings; discusses the potential need for developing limited wastewater treatment and drinking water supply facilities; and discusses the most important issues involved with maintaining continuity of services that residents expect.

This chapter addresses five major community service concerns that were identified by the Master Planning Committee in the Master Plan Goals and Objectives as being a high priority: 1) Protection of Persons and Property; 2) Recycling and Solid and Hazardous Waste Disposal; 3) Recreation and Cultural Services; 4) Highway Maintenance and, 5) Potential Future Community Facility Expansion Needs. The short and long-term space needs of the Shutesbury Elementary School are also described in this chapter despite the fact that public education services are often not addressed in Master Plans because much of the decision-making regarding educational services lies with the regional school district and superintendent.

Although Shutesbury does not currently provide residents with public wastewater treatment or public water, these services may be required in the future in densely populated or environmentally sensitive areas of town. At Lake Wyola, for example, where both population density and environmental sensitivity are of elevated concern, an alternative to the existing network of leaching fields and tight tanks could protect well and ground water, including the low- to medium-yield aquifers within the Lake Wyola sub-watershed, as well as preventing the future contamination of the lake, which at present is strikingly clean. A subsection of this chapter considers the feasibility of developing community water and wastewater systems in specific areas of the town. Potential uses of town-owned land are also included in this section.

The following goals were developed from the results of the 2000 Master Plan Survey. The objectives are listed with each subsection of the chapter

Goals:

- To continue to provide excellent police, fire, and ambulance service, solid and hazardous waste management, highway maintenance, library and recreational facilities, and elementary school education services.
- To plan and coordinate the provision of community facilities and services in an appropriate and cost efficient manner, which should be done in coordination with capital improvement planning.

Protection of Persons and Property

The Town of Shutesbury provides residents and property owners with police and fire protection services, emergency ambulance services, and emergency management services. When asked whether the town should spend more, less or the same amount of money on a number of budget items, 79 percent of the community survey respondents wanted the same or more ambulance service, 73 percent wanted the same or more police service, and 80 percent wanted the same or more fire protection.

Protection of Persons and Property Objectives

- Explore the short and long-term programming and funding needs of the Shutesbury Police and Fire Departments to support their continued level of service.
- Determine the most cost-efficient ways to upgrade the ambulance service to Shutesbury.

Police

Much of the information on the Shutesbury Police Department in this section is from a phone interview with the current (2003) Chief of Police, Charles Bray, in August of 2003. The Shutesbury Police Department provides protection for residents and property owners through two main services: traffic enforcement and patrolling.

The Police Department's office is located in the road level floor of the Shutesbury Town Hall. There are currently three full-time officers, including the Chief, Sergeant, and Patrol Officer, and four part-time officers that are paid for out of the overtime budget. The officers work two shifts per day from 7 a.m. to 11 p.m. with 2-3 hours of overlap. Normally, there is only one officer on duty at a time. The Department uses three cruisers and one sport utility vehicle. The three cruisers' odometers are at approximately 140,000 miles, 99,000 miles, and 40,000 miles while the SUV has 110,000 miles. The Capital Improvement Committee requested a replacement cruiser for fiscal year 2004, but this was postponed to the following year.

According to the town's Annual Report, during the fiscal year 2001/2002 there were 1,256 calls for service, 170 motor vehicle citations, three arrests for persons operating under the influence, and eleven for house breaks, and nineteen vehicle crashes in town. Shutesbury officers assisted with 16 calls for service in other towns. Massachusetts State Police responded to thirty-eight calls for service in town during the year.

Policing Issues

According to Chief Bray, office space and staffing are two long-term program needs that need to be addressed so that the Department can maintain the current level of service. As is explained below, space is a concern of the officers in two main ways: 1) a lack of room within the office diminishes the capacity of the Department, and 2) the location of the Police Department offices constrains the level of service that could be provided.

The Department's office is approximately 400 sq. ft. in size and contains three computer stations and the Criminal Justice System registration computer system. According to Chief Bray, there is no room in the office for processing arrested persons; this has to be done in Orange. Every police station in the state is expected to receive a grant-funded Breathalyzer that is typically tied into a computer. However, there is no room for a Breathalyzer in the current office. Because there is no room for this equipment, according to the Chief, they may be forced to return the Breathalyzer. There is also no room for questioning and debriefing both suspects and victims of crimes and complaints.

According to the current Chief, it would be better if the Police Department had space separate from the other town offices, where arrested persons could be processed; or a separate access way, to protect the confidentiality of persons filing complaints and the safety of town employees.

In an ideal world with ample funding, the space issues might be resolved through renovating the Town Hall or constructing a new police and fire safety complex, which may be a long-term solution. An appropriate first step towards resolving the issue could include a feasibility study to quantify the Police Department's space needs based on level of service requirements. For example, under the current office space constraints, all arrested persons must be transported to the Town of Orange. Creating a new or expanded space for the police force could be warranted if it was shown that the town critically needed this capacity. Currently, that need is not clearly documented.

The main staffing issue, according to Chief Bray, is the effect of having only three full-time officers and a minimum amount of overtime funds from which to pay part-time officers: lone officers with no back-up and no local police presence between 11 p.m. and 7 a.m. Without the present state fiscal crisis, Shutesbury residents might be willing to pay for additional staff. The Shutesbury Police Department Incident Log Summary accessed via the town's web site shows that police officers are called to provide many services for residents, from pursuing complaints between neighbors, to investigating 911 calls and dog complaints, to arresting people pursuant to a motor vehicle stop. Ideally, a police officer would not be alone in those situations. According to the officers, the majority of the service calls are made in the early morning and early evening

hours, when traffic volumes are heaviest. The need for more staff should be more carefully defined based on a specific identified gap in service. For example, there may be consensus that there are no local police officers on duty after 11 p.m. There may also be agreement that this results in Massachusetts State Police Troopers having to respond to calls for service during this time and that response times are typically fifteen to ninety minutes. However, it is unclear as to whether this gap of service is considered significant enough by residents to result in their voting to pay for additional staffing.

Emergency Fire and Medical Services

Fire and Rescue Services

The current Shutesbury Fire Department Chief, Water Tibbetts, provided the following information concerning the department's services and includes information on staffing and equipment. This subsection of this chapter includes a discussion of the department's short and long-term staffing and space issues. Some information concerning department equipment is also taken from Shutesbury's Emergency Management Plan (2001).

Currently, the Shutesbury Fire Department provides residents and property owners with a variety of services including fire protection, medical, rescue, and storm impact mitigation. In addition, department personnel are trained in dealing with minor hazardous material situations.

Staff

The Fire Department currently has nine staff (as of Sept. 2003). The Chief is paid an annual stipend of ten thousand dollars (FY2002) while the other eight firefighters are volunteers. Three of the firefighters are currently on probation, which is the six-month trial period for new members. The staff are on call twenty-four hours a day, seven days a week. Every Thursday, members participate in drill training for three to four hours. In addition, members are encouraged to take Massachusetts Firefighting courses sponsored by the Tri State Fire Mutual Aid Association, which has funded a recruit training program. Each member of the department gets a yearly training stipend of \$650 that seeks to help defray the costs of training. In a Special Town Meeting in 2003, the town voted to pay the firemen \$12.66 per hour for time spent on a call.

Equipment

The Shutesbury Fire Department currently has two Class A attack pumper tankers, one 1977 Dodge M880 Forestry Truck, and a 1990 four-wheel drive F350 Light Rescue vehicle. The attack pumpers each have the capacity to hold 1,000 gallons and pump at a rate of 1,250 gallons per minute. The expected useful life of these vehicles is approximately 20-25 years. One of the pumpers was built in 1987 and may therefore be in need of refurbishing in nine years time. The department tends to use the newer pumper (1997) more often, which may extend the life of the older tanker. The Light Rescue truck, which is used in almost every call for providing medical support, would be a more effective vehicle if the chassis was of a heavier class. The department

is seeking funding through a federal grant program to purchase a brush truck for fighting fires in wooded or meadow areas. Once acquired, the department would be able to re-engineer the Light Rescue Truck by switching chasses with the new brush truck, which would then provide extended life to the vehicle most often used by the department. In addition to vehicles, the department maintains a significant amount of equipment including defibrulators, high angle rescue equipment, HAZMAT suits, ventilation equipment, absorbents, air bags and monitors, barricades, hoses, breathing apparatus, rescue rope with harnesses, and cold water rescue suits. Through town and state grants and funding, the Shutesbury Fire Department is not constrained by a lack of equipment.

Fire and Rescue Services Issues

Personnel

The main constraint to the Shutesbury Fire Department maintaining service as the population continues to grow involves personnel. According to the current Fire Department Chief, it has become more and more difficult to sustain a full cadre of experienced firefighters over time. This is in part due to the difficulty of recruiting and training volunteer firefighters, the burden of keeping up with training needs, and other associated issues related to providing municipal emergency services via volunteers.

According to the Fire Department Chief, prospective recruits with trade skills such as electric, masonry, plumbing, and construction have become more rare over time. This has resulted in the need for more extensive training for new firefighters who typically do not have the practical hands-on skills that people in trade professions have acquired, especially those that relate to the inner workings of buildings, plumbing, and electrical service facilities. Incoming recruits must now fill out a nine-page application that has been expanded in scope to identify in more detail to the department the relevant skills of the candidate and, to the applicant, the risks and training expectations associated with the position.

Each year, the amount of training required to maintain a high level of service is substantial while financial support of the firefighters' training time is minimal. Fire Department staff need to stay familiar with building code changes, new equipment, procedures and vehicle models. Unfortunately, the \$650 training stipend given to each firefighter must cover the 150 to 200 hours per year of drill training, which occurs every week at the Fire Station. This stipend represents assistance of between \$3.25/hr. and \$4.33/hr. The annual stipend does not cover additional time that a firefighter would spend at Massachusetts Firefighting courses.

The Shutesbury Fire Department staff is a volunteer force that commits to responding to a call for service at any time. Two officers currently work in-town and often respond to service calls more frequently than others. Although neighboring towns' fire departments provide mutual aid, the capacity of Shutesbury's volunteer force to provide a firefighting, rescue, or an initial HAZMAT response is less than what would be available if the town were to have a full-time firefighter, or Chief.

Funding

The Shutesbury Fire Department had a total budget of \$35,337 in fiscal year 2002. The Fire Department took a 10 percent cut in three of the previous four fiscal years. According to the current Chief, the Department has been able to deal with budget cuts due to their frugality with some types of equipment spending and because they have succeeded at attracting grant funding. For the short-term, the Department will be able to maintain a level of service expected by residents.

Over the long-term, as the population grows, funding needs will likely increase. The Fire Department will attempt to maintain the level of service given the existing stipend structure and potential equipment needs. If firefighting recruits with trade skills continue to be rare, training the volunteer crew will become even more important. More training time for volunteers would put the burden on volunteers' families. This may involve a financial burden volunteers may be less willing to shoulder over time. Although equipment and space needs are adequate today (2003), the department may need a new brush truck, tanker, and a trailer for the HAZMAT equipment they currently have, which would likely require another garage bay or two.

Emergency Medical Services

The Amherst Fire Department has a fully staffed station that provides coverage to the towns of Hadley, Leverett, Pelham, and Shutesbury. Patients transported by the Fire Department most frequently go to Cooley Dickinson Hospital in Northampton. However, emergency patients may be also transported to Mary Lane Hospital in Ware, Wing Memorial Hospital in Palmer, Franklin Medical Center in Greenfield, or Baystate Medical Center in Springfield. A round-trip ambulance call to Cooley Dickinson commits a minimum of two on-duty personnel, as an ambulance crew, for about 1 1/2 hours. Shutesbury pays an annual stipend to the Town of Amherst for this service. In 2003, the stipend is equal to a payment of \$8.78 for every person in town as identified in the 2000 Census (1,810), or \$15,891.80. The cost of an ambulance trip, which is charged to the individual in need of transport and EMS, ranges from \$400 to \$1,100 based on the level of medical services required. Typically, an individual's medical insurance will pay most of the ambulance cost, if they have insurance.

The state requires all firefighters and police officers to receive the First Responder level of EMS education every three years. A First Responder is trained in basic first aid and cardiopulmonary resuscitation (CPR). Above and beyond this basic training, an individual must work towards certification as an Emergency Medical Technician (EMT).

According to the Shutesbury Fire Department Chief, Walter Tibbetts, there is no apparent need to improve the ambulance service beyond what is provided currently. According to the Shutesbury Fire Chief, the Amherst Fire Department does a good job providing emergency medical services to Shutesbury residents. To shorten the response time to some locations in town, the Town of Shutesbury would have to fund local paramedic-level service, which would require two full-time personnel and at least one ambulance to guarantee service.

Emergency Management Services

The Massachusetts Emergency Management Agency (MEMA) Region III headquarters in Belchertown, Massachusetts provided a copy of Shutesbury's Emergency Management Plan, which was used as the main source of information for this subsection. An electronic copy of this plan is available through the office of the Shutesbury Town Administrator. An officer of the Shutesbury Fire Department Emergency Management currently holds the Shutesbury Emergency Management Director's position.

The purpose of the Shutesbury Emergency Management Plan (EMP) is to provide a framework for the community's planning and response to emergency situations on the local, state, or national level. The EMP is a comprehensive document that describes the responsibilities of boards and committees in an emergency and the resources available for mitigation, preparedness, response, and recovery activities. The specific hazards covered in the EMP include earthquakes, flooding, hurricanes, dam failures, radiological plume pathway, terrorism, tornadoes, weapons-related incidents, winter storms, and hazardous material spills. For these types of hazards, the EMP identifies alternate routes of evacuation, areas most threatened by specific hazards, the locations best suitable to serve as shelters, and the roles of the select board, police, fire, and public works departments, the health board, and assessors.

Police and Emergency Fire and Medical Recommendations

- **The community should develop a feasibility study that includes a comparison of needs versus services, which could also focus on determining appropriate solutions for any Police Department space and staffing issues.** The Select Board could appoint an Ad hoc Committee to assess current and potential future space and staffing needs for the Police Department.
- **The community should resolve Shutesbury Fire Department training, recruitment, and retention issues with the help of a Select Board-appointed Ad hoc Committee.** The Select Board could develop an advisory, or Ad hoc Committee to assist in assessing and resolving the Fire Department's staffing issues.
- **Establish a fund to help pay for ambulance services for people without health insurance.** Because ambulance services are already provided in a cost-effective manner, the best way to address the potential need for expanded ambulance service in Shutesbury may be by providing financial assistance to residents that have no health insurance.
- **Review the Shutesbury Emergency Management Plan and use it as a tool to strengthen communication among town officials, boards, departments, and committees.** The Emergency Management Coordinator could coordinate an all-board meeting to review the plan and the roles and responsibilities of various boards in the event of a natural or human-caused disaster. In addition, each board and committee should have an up-to-date version of the Shutesbury Emergency Management Plan.

Recycling and Solid Waste Disposal

All towns in Massachusetts are faced with similar challenges concerning the disposal of municipal solid waste. Massachusetts is a densely populated state where landfill space is limited. According to the Massachusetts Solid Waste Master Plan, the current waste disposal trends include the following:

- *Increasing waste generation* – Overall, residents and businesses in the state produced 31 percent more waste in 2000 than in 1990.
- *Limited in-state waste disposal capacity* – Massachusetts exports one million tons of solid waste to other states for disposal per year along with the job of managing the environmental impacts of waste disposal.
- *Slowing recycling increases* – The growth in the recycling rate slowed in the last part of the 1990s. Further improvements would likely require a concerted effort by all.
- *Sharing responsibility for the waste problem* – Manufacturers have begun to help reduce waste through redesign and by encouraging recycling.
- *Fewer management options for non-municipal materials* – As landfill capacity decreases, newer methods are needed to dispose of non-municipal waste, such as construction and demolition debris.

When landfills in the region become full, communities must seek other locations and methods for disposing of the waste that is generated by its residents, businesses, and institutions. Communities have dealt with these challenges by identifying the most cost effective sites for disposal and by organizing to purchase stable long-term trucking and disposal contracts. In the summer of 2002, the Amherst Landfill closed to commercial haulers and Shutesbury chose to send its trash to the Pioneer Valley Resource Recovery Combustion Facility (PVRRCF) in Agawam, Massachusetts, owned by Eco/Springfield L.L.C. The town has also been successful in negotiating a cost-effective contract with Duseau Trucking to haul both recycling and trash to the Springfield Materials Recycling Facility and the Agawam facility, respectively.

Other methods for reducing solid waste disposal costs include increasing the participation and efficiency of a town's recycling program. For example, many communities, including Shutesbury, have implemented "pay as you throw" fee programs that encourage people to recycle by making residents pay for every bag of trash they put out for pickup. Shutesbury's program is described in more detail later.

This section presents information about the methods used to dispose of solid and hazardous waste in Shutesbury. Specifically, it describes programs offered via the Shutesbury Recycling and Solid Waste Committee on behalf of the town: trash removal and recycling, bulky waste days and roadside swap weeks, and hazardous materials storage and disposal. Much of the information presented in this section of the chapter is from a phone interview with Paul Vlach, Shutesbury Recycling Coordinator, and Recycling and Solid Waste Committee Chair, in August 2003, from the Town website (<http://www.shutesbury.org/recycling/index.htm>) and from information published on the state's website including a fact sheet developed by Massachusetts Department of Environmental Protection, "Beyond 2000 Solid Waste Master Plan Highlights." The amount of recycled materials and solid and hazardous waste disposed, method of collection

and disposal, costs and important issues and concerns are described. Potential recommendations are presented at the end of the section that address the following Master Plan objective:

- Increase participation among Shutesbury residents in recycling, home composting, and hazardous material drop-off programs.

Trash Removal, Recycling and Composting

Shutesbury has had a Recycling and Solid Waste Committee since the mid-1980s. Currently this nine-member committee plans and facilitates recycling and solid waste disposal services in town in an integrated fashion. The trash hauler, Duseau Trucking, acts as the default enforcer of the town's strict recycling and trash requirements, which results in uncontaminated trash loads and reduced litter problems. Trash bags filled with recyclable materials, or recyclables containing trash, are rejected. Bags weighing more than 35 pounds, or containing yard waste, construction debris or hazardous materials, are also rejected. Households that follow the recycling and trash requirements spend less money to dispose of their waste. Not allowing yard waste or hazardous materials to be disposed of via trash bags helps to encourage households to manage their waste stream and reduces the costs for trucking and disposal.

A level of trash removal is paid for through property taxes. Residents receive 50 bags annually in a Pay-As-You-Throw trash bag system instituted in 2001. Residents that want to dispose of more trash may purchase additional bags from area stores for \$2.00/bag, which covers costs. In fiscal year 2002, Shutesbury paid \$47,400 for hauling trash and recycled materials, \$987 for hazardous waste pickup (paid to Amherst), and \$25,207.25 for use of the landfills. Due to the state budget crisis, towns no longer receive a check from Massachusetts recycling facilities for delivery of recycled materials. Towns with their own transfer stations like Amherst have the ability to work with vendors who accept, collect or purchase recyclable materials from Massachusetts communities and businesses.

As Shutesbury residents adopt behaviors that result in reuse and reduction of waste, such as Swap Week exchanges and composting, the expense of trash hauling and disposal will be reduced. However, if residents focus solely on increasing the amount of trash they recycle, these expenses will not decrease very much or very rapidly, as the town will still have to pay to haul recycled materials to the Springfield MRF. Thus town officials should continue to encourage people to reduce the total amount of materials to be disposed of at curbside. The goal should be to reduce dependence on disposable products, reuse or extend the life of objects or materials, and compost kitchen, yard, and paper waste before adding materials to the waste stream either as trash or as recycling.

The town could also help to inform residents on ways they can prevent waste by purchasing products with less packaging. According to the U.S. Environmental Protection Agency, waste prevention, also known as "source reduction," is the practice of designing, manufacturing, purchasing, or using materials (such as products and packaging) in ways that reduce the amount or toxicity of trash created. Reusing items is another way to stop waste at the source because it delays or avoids that item's entry in the waste collection and disposal system. Source reduction, including reuse, can help reduce waste disposal and handling costs, because it avoids the costs of

recycling, municipal composting, landfilling, and combustion. Source reduction also conserves resources and reduces pollution, including greenhouse gases that contribute to global warming (<http://www.epa.gov/epaoswer/non-hw/muncpl/sourcred.htm#facts>).

Table 4-1: Number of Tons of Solid Waste Hauled between 1998 and 2002

Year	Solid Waste (tons)	Recycling (tons)	Recycling Rate
2002	339.4	199.8	37%
2001	331.7	248.4	43%
2000	386.2	171.2	31%
1999	400.3	181.5	31%
1998	410.2	176.6	30%

Source: David Ames, Shutesbury Town Administrator, 2003.

Table 4-1 shows the number of tons of solid waste and recycled materials hauled out of Shutesbury between 1998 and 2002. According to David Ames, Town Administrator, in 2002, the town had a recycling rate of 37 percent while in 2003 the rate was approximately 34 percent. The recycling rate is determined by dividing the amount of waste that is diverted out of the trashcan into the recycling bins by the total amount of solid waste disposed.

If you include bulky items and white goods in the diverted waste category, as DEP does in its web database, the town’s recycling rate was 52 percent in 2002 (unconfirmed). Based on DEP’s database, which is developed from information sent to them by municipalities, the 2002 recycling rates of the four other towns in Franklin County with populations (2000 Census) of between 1,600 and 1,850 were: Conway with 40 percent, Ashfield with 54 percent, Colrain with 60 percent and Leverett with 63 percent.

Even if the town’s recycling rate of 52 percent is found to be accurate, the rates of other towns of similar size shows that there may be room for improvement. What method could the town employ to seek yearly increases in its recycling rate? Increased enforcement of trash restrictions (e.g. rejecting bags that contain recyclable materials) by the hauler is one method that may not be as effective as working to increase residential composting.

Composting is one way to divert more waste away from the trashcan. Composting is a safe, efficient and relatively inexpensive way to convert food and yard wastes into a usable product. Town and home composting programs, combined with public education, may expand participation. In our region’s smaller towns, yard waste has never been a significant part of the waste stream but towns with larger populations, like Montague, maintain yard waste piles. The Shutesbury Recycling and Solid Waste Committee has successfully initiated an on-site food composting program in the Elementary School. Promoting the success of that program could help increase people’s awareness of the benefits of composting household food scraps and paper goods and ultimately lead to a reduction in the amount of town funds expended to dispose of municipal waste.

The Recycling and Solid Waste Committee already works to inform residents of the importance of reducing the amount of trash disposed each week. The town web site contains interesting facts on how this can be accomplished: by purchasing consumer goods that have less packaging, or mostly, if not all, recyclable packaging; by returning materials used in packaging like Styrofoam peanuts; and by reducing the amount of junk mail that residents receive.

Bulky Waste Days and Roadside Swap Weeks

Both Bulky Waste Days and the Roadside Swap Week help divert materials from the waste stream. The Spring and Fall Bulky Waste Days are typically held on a Saturday in May and in October at the Highway Department, while the Committee's suggested week-long time for placing reusable items at curbside (Swap Week) runs the week before. The Bulky Waste Days offer residents an opportunity to dispose of large items not accepted in weekly curbside trash collection and to shop through the large items left by others. "White goods" - enameled metals such as stoves, washers, dryers, etc; scrap metal, tires and furniture- can be brought to the Highway Department yard on Leverett Road between 9 a.m. and 2 p.m., without appointment. Fees are assessed to cover the cost of the roll-off containers and dumping fees.

As part of the Bulky Waste Day, Shutesbury offers residents an opportunity to dispose of items with electronic circuitry, which are banned from landfills by Massachusetts law. These items include computers (all parts), televisions, radios, stereos, remote controls, CD players, touch tone and cordless telephones, VCR's, fax machines and answering machines. The town collects and processes them through the UMASS Intermediate Processing Facility. The town is charged a fee for the associated costs of legal disposal, which may be covered by grants in the future.

In addition, the Bulky Waste event includes a station to receive bagged inkjet, laser, fax, copier cartridges, and used cell phones. These cartridges are then recycled and refilled, and the sponsors of this station, the Shutesbury Elementary School Special Education Parents Advisory Council, receives a modest rebate for each cartridge they send in. Residents can also drop off depleted cartridges at the Town Hall, Post Office, and the school anytime. Finally, the Amherst Survival Center receives some of the dropped off items during the bulky waste days.

During Roadside Swap Week, residents can place unwanted household items roadside, with a "free" sign. Usable furniture, toys, athletic equipment, flower pots, building materials, books, clothing, paint and other items are made available for re-use by other residents. Some residents also continue this tradition throughout the year to recycle other unwanted items.

Hazardous Materials Storage and Disposal

The town recently received a grant to construct a Universal Waste Shed in the back of Town Hall. The shed can safely store fluorescent light bulbs, household batteries, and computer monitors. These hazardous materials were previously stored in the Town Hall basement.

Household hazardous waste disposal service is through a joint program in area towns using the Town of Amherst's Landfill as a drop-off location during six, one-day events in the spring and fall. Households must pre-register and can dispose of no more than 25 gallons or 25 lbs. (whichever is greater). The following materials can be disposed of at the event: Adhesives (2 part), art/hobby paint, button batteries, chemistry sets, disinfectants, drain cleaners, epoxy, flea killers, fluorescent bulbs, furniture polish, insect pump sprays, kerosene, metal polish, moth balls, photography supplies, rechargeable batteries, rodent killers, septic tank cleaners, spot removers/solvents, thermostats, toilet bowl cleaners, varnishes, DDT, fertilizers with herbicides or pesticides, herbicides, pesticides, root killers, tree oils, weed killers, antifreeze, automotive

fluids, car batteries, creosote, dry gas, engine degreasers, gasoline, lead acid batteries, motor oil, paint thinners/solvents, paint: aerosol, lead, marine oil-based paints; stains and polyurethane, swimming pool chemicals, varnishes, and wood preservatives.

Recycling and Solid Waste Issues

Shutesbury's Recycling Rate is Not Increasing

Because Shutesbury's curbside recycling rate slipped from 37 percent in 2002 to 34 percent in 2003, town officials may want to work more with the Recycling and Solid Waste Committee to encourage residents to recycle and compost more of their household solid wastes. The Committee may want to consider new ways of encouraging residents to compost their kitchen and yard waste.

Household Hazardous Waste Disposal

Household hazardous waste disposal is accomplished via a drop-off service offered by the Town of Amherst. It is unclear whether residents are well aware of the materials throughout their homes that contain hazardous materials or whether they know how to properly dispose of them. Improper disposal of these household materials could result in groundwater contamination. Until more is known about groundwater movement around town, residents should assume that all wells and streams are vulnerable to contamination. To best utilize the existing service, town officials may want to increase promotions of the hazardous material disposal days.

Recycling and Solid Waste Disposal Recommendations

- **Promote environmentally proper composting more aggressively to reduce the amount of curbside solid waste to be hauled.** The Shutesbury Recycling and Solid Waste Committee (RSWC) should develop an effective way to demonstrate how paper might be composted at home and create a community compost pile for those who prefer not to compost at home, with the result used for gardens at the library, school, or other town properties.
- **Educate students about hazardous wastes in school or via the website more effectively.** The Recycling and Solid Waste Committee (RSWC) and the Board of Health could seek grant funds to help pay for educational programs that focus on discussing which materials are considered hazardous and what are the best methods for their storage and disposal.
- **Encourage participation in the hazardous material days each year.** The RSWC in conjunction with the Board of Health should increase residents' participation in the hazardous material days each year.
- **Promote the use of non-hazardous alternative products.** Through its website, the town could provide access to environmentally "green" products to residents and town staff.

- **Encourage source reduction through articles in the *Our Town* newsletter and the town’s website.** The RSWC could seek to increase residents’ awareness of the impacts of their current consumption patterns on curbside solid waste volumes and encourage people to choose low-package products. Showing residents how to reduce the amount of waste entering their homes via the products they choose to purchase may decrease total curbside waste.
- **Review the bylaws to consider ways of prohibiting the storing of more than two, non-registered vehicles on land under one ownership.** The Planning Board might want to consider revising the zoning bylaws to include a prohibition of the storing of more than two unregistered vehicles. Stored vehicles can leak hazardous materials that could contaminate wetlands, groundwater, and private wells.
- **Increase the unit cost for residents’ purchase of trash bags beyond the fifty-count provided to encourage composting and recycling.** The town could require people to pay more per bag of curb-side trash beyond a particular threshold (e.g. 50 bags per year). This method is similar to that used by community water suppliers, some of which charge a higher rate per gallon beyond a certain number, as a means of conserving water.

Recreational and Cultural Facilities and Services

The Town of Shutesbury provides recreational and cultural services by maintaining a very popular public library, by providing access to several sports fields and open space areas for outdoor recreation, and by providing services to seniors. A Transition Plan currently being updated will address the Americans with Disabilities Act improvements. It is also important to recognize the recreational and cultural services that public and private agencies, organizations, and entities provide to residents and visitors within the town (*see Table 4-2*). The two Master Plan objectives below seek to expand these recreational services:

- Develop new, and expand existing, multiple-user recreational trails connecting Shutesbury’s open space, natural, and historic resources.
- Expand the library services in such a way as to ensure the enjoyment of all.

Recreational and Cultural Facilities and Services

Diverse recreational and cultural opportunities serve a community in many ways. Often the sense of community in a town relates to the experiences of neighbors interacting with each other during their leisure time near their homes or at community-wide celebrations at some central location. The experience of community can be enhanced through activities, events, resources, and programming that seek to bring people together again and again throughout the year. Recreational resources include open space (e.g., sports fields) used for this purpose, facilities that

provide different recreational activities like the Shutesbury Athletic Club, and programming for different age groups sponsored by the town or by volunteer organizations.

Shutesbury’s environment provides many opportunities for outdoor recreation. The presence of large blocks of undeveloped forestland, protected conservation lands, and trails to connect these areas to meeting places provide a foundation for community-building among area residents based on a shared appreciation for the outdoors. There are thirteen recreational sites identified in this chapter that are open spaces.

In general, Shutesbury provides access to two types of recreational facilities and services: sports fields and open space. Recreational areas are managed by both public and private entities. Table 4-2 identifies the facilities, common activities, ownership, size, extent of resources, and issues and opportunities associated with each area or facility identified in the 1999 Shutesbury Open Space and Recreation Plan and by the Recreation and Open Space Committee. The text following Table 4-2 describes the recreational resources in greater detail.

Table 4-2: A Summary of Recreational Resources and Facilities in Shutesbury

Map #	Name of Area or Facility	Main Recreational Value or Use	Owner of Land/ Manager	Size of Area	Extent of Resources	Issues/ Opportunities
1	Lake Wyola State Park (Carroll Holmes Recreation Area)	Swimming, fishing, and picnicking.	Commonwealth of Mass. (State)/Dept. of Conservation and Recreation	42 acres	Public beach with life guards, picnic tables, barbecues, parking	Daily parking may be expensive for residents though season passes make cost more reasonable.
2	Shutesbury State Forest	Hiking and hunting	State/Department of Conservation and Recreation	715 acres	A gravel trail that connects Cooleyville Road to Wendell Road	Wendell Road access is next to driveway of private residences. Lack of signage and parking, Potential for natural history tours.
3	Lake Wyola Town Boat Launch Ramp and Picnic Area and South Brook Conservation Area	Fishing, hiking, and wildlife viewing	Town of Shutesbury/ Shutesbury Conservation Commission	97 acres	Boat ramp, water craft put-in, and trails	Motorized use of trails damages sensitive areas.
4	Town Common	Walking and community events	Town of Shutesbury /Select Board	0.32 acres	Large lawn area close to Library, Town Hall, & Post Office	Some conflict around Common’s current and future uses.
5	Town Soccer Field behind Fire Station	Soccer, other sports, seasonal festivities (e.g., bonfires)	Town of Shutesbury/ Recreation and Open Space Committee	2.5 acres	Old 4-H riding corral, large lawn area with goal posts and old baseball diamond	The soccer field needs to be improved by removing rocks and reseeded.

Map #	Name of Area or Facility	Main Recreational Value or Use	Owner of Land/ Manager	Size of Area	Extent of Resources	Issues/ Opportunities
6	Town Playfield behind Town Hall	Seasonal festivities (e.g., Easter egg hunt), picnicking, hiking	Town of Shutesbury/ Highway Department mows field	3 acres	Mown grass area (0.7 acres) and cut field	Future recreational use of this land may be dependent on its planned use for town hall and library expansion.
7	Town Elementary School Field and woods	Softball and soccer	Town of Shutesbury/ School Staff maintain lawn	8 acres incl. 1.2 acre lawn area	Back stop and homemade soccer goal nets	The field needs upkeep but is within the Zone I of the school's well. Town needs to negotiate solution with DEP.
8	Town of Amherst Watershed Lands	Hiking and hunting	Town of Amherst/ Amherst Water Department	677 acres	Unimproved trails	Negotiate fair payments in lieu of taxes (PILOTS).
9	Quabbin Watershed Lands	Hiking, fishing and hunting	Comm. of Massachusetts/ Division of Watershed Management	5,020 acres	All areas within town open to hiking. Skiing and biking not allowed on lands east of Rte. 202	Potential to develop a trail system on lands west of Rte. 202.
10	Shutesbury Athletic Club	Entertainment center for music, dancing, and cookouts with a liquor license	Private	40.5 acres	Indoor and outdoor entertainment facilities that can be rented by members for events	There may be a need for a more public entertainment facility. Smoking in the bar may make the facility inaccessible to some residents
11	Morse Hill	Adventure and personal and team skill building activities	Private	85 acres	High Ropes, Low Ropes, Field, Campsite, River	Could be used by the town as a means of developing leadership skills in the community.
12	Robert Frost Trail and Metacomet and Monadnock Trail	Hiking on mostly privately owned land in southwestern corner of town	Private/Public Lands throughout entire length of both trail	40 miles	RFT-Maintained hiking trails South Hadley-Wendell MM-from CT to NH	Opportunity to tie-in local trails with both long distance trails.
13	Garbiel Gift	Used for picnicking and camping in the past	Town of Shutesbury Conservation Commission	1.4 acres	Grass area at end of Cove Rd. on Lake Wyola	The site could be developed into a public park and picnicking area. Needs parking area. Potential for misuse of area.
14	Lake Wyola Island	Potential for picnicking and nature study	Town of Shutesbury Conservation Commission	0.6 acres	Lawn area and island near Wyola Drive	Bridge that spans lake appears to be a liability.

Map #	Name of Area or Facility	Main Recreational Value or Use	Owner of Land/ Manager	Size of Area	Extent of Resources	Issues/ Opportunities
15	Temenos	Retreat center	Temenos	78 acres	Private access to a lodge, four cabins, trails, and a pond	Center could be used by town groups in need of a neutral location for a retreat.
16	Sirius community	Demonstration area for Permaculture and a conference center that is open to the public	Sirius	90 acres	Private access to a Conference Center, demonstrations in renewable energy, and a trail system	Potential source of information on renewable energy and energy conservation alternatives, solar power, and wind turbines.
17	Snowmobile Trails	A vast system of trails located mostly to the west of Wendell Rd and Montague Rd.	Private landowners/ Some trails are Maintained by the Porcupine Ridge Runners Club	Trails cross many owner-ships	Well-maintained trails for winter use by Porcupine Ridge Runners Club members and by general public	The trail system is for winter use and dependent on the relationship between landowners and the private club. Non-winter use of trails by other motorized vehicles can be a concern.
18	Lake Wyola Association Beaches and Pavilion	Community events and access to Lake Wyola for members and guests.	Lake Wyola Association	1.3 acres which includes a .3 acre beach. Another 8.5 acres are in roads	Maintained beach areas and a community pavilion	The Lake Wyola Association events, open to all town residents, could be promoted as a means of bringing together all of Shutesbury's communities.

Source: 1999 Shutesbury Open Space and Recreation Plan; Personal communication with Recreation and Open Space Committee member P. Lyons, 8/2003. Note: DEP = Massachusetts Department of Environmental Protection

Many publicly-owned open space areas in Shutesbury provide multiple benefits including water supply protection, space for active and passive recreation, and wildlife habitat. Each area listed below is also described in the Natural Resources and Open Space Chapter of this Master Plan. The numbers in the parentheses represent the area's map number located on the Community Facilities and Services Map at the back of the chapter.

Detailed Descriptions of Recreational Resources in Table 4-2

The Lake Wyola State Park (Map #1) and the Shutesbury State Forest (2) are both owned by the Commonwealth of Massachusetts but are maintained quite differently. The types and intensity of recreational activities encouraged on each provides a variety of recreational opportunities.



A gravel trail running between Cooleyville Road and a driveway off Wendell Road provides access to the Shutesbury State Forest (2). Hunting, hiking, mountain biking, cross-country skiing and snowmobiling are probably the most common recreational activities.

The Carroll Holmes Recreation area at Lake Wyola State Park (1) on the other hand is managed for a diverse set of recreational activities including swimming, hiking, fishing, volleyball, barbecuing and picnicking. In addition, a soccer field and hiking trail connections may be



developed in the future. There are also cross-country ski trails between the park and Wendell State Forest, where there is an extensive winter sports program. The Department of Conservation and Recreation (DCR) bought the former, privately run Lake Wyola Park from Emelia Bennett in 1997, and named it after Carroll Holmes, a former Shutesbury Select Board member and director of DCR's Region IV. The park includes an accessible bathhouse, parking areas, and seven accessible picnic tables with barbecue stands, wooded shade, sandy beach and a cordoned off swimming area. Across the road from the beach is

a separate picnic area partially located within a stand of white pine trees that contains ten mostly shaded picnic tables and barbecue stands (*see picture at upper left*). Beach capacity is estimated to be between 200 and 250 people. Lifeguards are on duty every day during the summer, and after Labor Day, swimming is prohibited though the park is open for picnicking and other non-swimming activities.

The Town of Shutesbury owns two properties with frontage on Lock's Pond Road: the Lake Wyola Town Boat Launch Ramp and Picnic Area and the South Brook Conservation Area (3). Together the two properties encompass 97 acres and offer active and passive recreational opportunities. The Lake Wyola Town Boat Launch Ramp and Picnic Area includes a large parking area at the end of Randall Road, which is closed to vehicular traffic during the winter months (*see picture at right*). A partial gravel and asphalt boat ramp provides access to the Lake from the parking area. The Picnic Area appears to have received a recent upgrade including a drainage ditch and reseeded. The lakeshore in this area appears to be comprised of naturally occurring silts and clays, not sand. There is evidence that the Picnic area is a popular destination for anglers. Some residents complain of having to swim in an area so frequented by dogs.



The South Brook Conservation Area (3), managed by the Shutesbury Conservation Commission, provides access to a variety of trails year-round. Trails can be accessed off of the Town Boat Launch and Picnic Area, Lock's Pond Road, and Wendell Road. A club of snowmobile enthusiasts maintains some of these trails for mainly winter use. Some all-terrain



vehicle use during the spring and fall months has resulted in damage to the trails surface near local wetlands. The town has yet to establish a forum for discussing trail issues or a plan for maintaining trails not currently managed by the snowmobile club.



The Town Common, overseen by the Select Board, (4) has been recognized by residents and town officials as a site of historical significance and as a valuable space for community events and festivals. The town owns approximately 0.32 acres of land on the Common. The remaining acreage is comprised of the land surrounding the M.N. Spear Memorial Library and Town Common Road. Two war memorials, a guide post, three picnic tables, the Shutesbury Community Church, and large shade trees are found on the Common.

A recent Town Center Plan prepared by students from the Conway School of Landscape Design (2002), recommended removing the large spruce and white pine trees as well as the trees near the memorials to improve sight lines near the two most dangerous intersections, as well as to improve the Common's overall aesthetics.

The Town Recreation and Open Space Committee maintains a soccer field behind the Fire Station (5). The soccer field uses most of the maintained lawn area, though an old baseball backstop and volleyball posts are also found close to the parking area behind the station. An old 4-H horse corral is located at the southern end of the two and half acre open area. The soccer field contains both new portable nets and older in-the-ground posts.



A field in back of the Town Hall (6) includes a lawn area of approximately 0.7 acres that serves as the leach field for the Town Hall and is used for seasonal community events and recreational activities. The Shutesbury Highway Department mows the field. South of the mown area is a 2.3-

acre cut field. According to the Shutesbury Town Center Plan, most of the mown area would be used for the footprint of the library and its associated parking lot. The town has recently acquired forest land (Map D Lots 43 (3.4 acres) and 48 (5.6 acres)) south and east of the field.



The Shutesbury Elementary School (7) property

includes two playgrounds and a large playing field. There is a main playground west of the school and a tot lot with a play structure for young children to the south of the school. The main playground contains one backstop, two structures for goals, two basketball hoops with one full court, two tetherball poles, one large wooden play structure, four jungle gym structures, and a swing set with six swings. Trails run from the back of the playground southerly towards a wooded drainage area. Hikers recently noted that the trail accesses both Amherst Water Supply lands and the Leverett Elementary School.

The large playing field, which is maintained by school staff, is approximately 1.2 acres in size. The field's recreational use is constrained by the fact that it is partially within the Zone I wellhead protection area of the school's groundwater supply. Although the Recreation and Open Space Committee is interested in upgrading the field through grading and reseeding, any future renovations would first need to be approved by the Massachusetts Department of Environmental Protection.

The Town of Amherst owns 677 acres (8) within the Adams Brook Sub-watershed, which has been set aside for water supply protection purposes. The lands are used for hunting and hiking and contain many unimproved trails.

Overall there are over five thousand acres of Quabbin Watershed lands in town (9). This forested land, which is owned by the Commonwealth of Massachusetts and managed by the Division of Watershed Management, allows biking, skiing, and hiking on Off-Reservation lands west and north of Rte. 202. The Recreation and Open Space Committee considers there to be a potential for developing trails on these lands. Quabbin Park lands east of Rte. 202 are open to pedestrian access only.

The Shutesbury Athletic Club (10) provides residents a private gathering place and a source of entertainment in an indoor facility. The Club is located at the intersection of John Plaza Road and Wendell Road. A large parking area, outdoor swing set, and a pavilion provide a variety of social and recreational opportunities for club members.

Morse Hill (11) is a privately owned outdoor adventure center, which provides organized recreational activities and team building and personal achievement programs, located off Lock's Pond Road near Lake Wyola. Morse Hill contains a high ropes course, a low ropes course, a large field with obstacles and group challenges, a campsite and a river site. Town residents and organizations have utilized Morse Hill's facilities and services.



The Robert Frost Trail and Metacomet and Monadnock (M & M) Trail (12) traverse privately owned lands in the southwestern corner of town. Both trails enter Shutesbury from Amherst and cross Pratt Corner Road. The Robert Frost Trail stretches forty miles from the Holyoke Range to Ruggles Pond in Wendell. The M & M Trail starts at the Massachusetts/ Connecticut State line at Rising Corner in Connecticut. It passes through Hampshire and Hampden County towns to Shutesbury, where it follows the Robert

Frost Trail to Atkins Reservoir and then onward to Brushy Mt. in Leverett, Ruggles Pond in Wendell, Northfield Mountain in Erving, Mt. Grace in Warwick and finally to the summit of Mt. Monadnock.

The Garbiel Gift (13) is a 1.4-acre parcel of land managed by the Conservation Commission, which is located at the end of Cove Rd. on the eastern shore of Lake Wyola (*see photo to the right*). With a mowed and level grassy area about a tenth of an acre in size, the Garbiel land could be used for picnicking, fishing and nature study. The site lacks parking.



The town recently acquired land along the north shore of Lake Wyola (14). Parcel B-679 contains an island and the land under the water surrounding it. According to the Assessor's maps, the small island is approximately 150 feet long and about 50 feet wide. The picture on the left shows a bridge spanning a portion of the lake from the island to the land represented by Parcel B-698.

Parcel B-698, shown on the right is a level lawn area between two house lots. The picture was taken looking east from Merrill Drive towards the bridge and the island. The town may want to consider building a fence



along the property's northern boundary.

Temenos, Inc. (15) is a retreat center located off Mt. Mineral Road in the northwestern portion of Shutesbury. Founded by Quakers, Joseph and Teresina Havens, this sanctuary is open for use by individuals and small groups from May to October. Rustic accommodations include four cabins, a lodge, and a small pond. To the east of Temenos- seventy-eight acres is thousands of acres of protected forestland owned by the Commonwealth of Massachusetts, and managed for water supplies by the Department of Conservation and Recreation, Division of Water Supply Protection.

The Sirius Community (16) is located off Baker Road in the southern part of town. Sirius is an educational, spiritual, service community of twenty to thirty residents and about two hundred associate non-resident members. It is an intentional community that is also a demonstration site for Permaculture Design, an eco-village that models organic food production and green energy generation using "green" building and passive solar construction, solar and wind power, organic agriculture, waste management, and composting and energy efficient appliances. Sirius engages in community outreach through hosting workshops, apprenticeships, courses and open houses.

The Porcupine Ridge Runners (17) is a private snowmobile club whose members live in Shutesbury and surrounding towns. The club maintains a system of trails that cross private and

public lands. The trails are typically maintained by club members for use by snowmobilers, though skiers are also known to use the trail system in the winter. Mountain bike, dirt bike, ATVs, and 4-wheel drive enthusiasts are also known to use these trails during the spring, summer, and fall months.

The Lake Wyola Association (LWA) (18) was created in the 1950s to oversee the summertime social activities around the lake. Currently there are over 120 dues paying members. The LWA also oversees legal matters pertaining to the lake. People from the town and surrounding communities participate in LWA sponsored activities such as the Road Race, Pancake Breakfast, Steak Roast, Chicken Barbeque and Tag and bake sale. The LWA community building is available to rent for private gatherings and has a full kitchen and toilets. The LWA has hosted town events in the building, most recently a "Seven Saturdays in Shutesbury" event in May 2003.

Recreational Resource Issues

More Leadership Needed

The 1999 Shutesbury Open Space and Recreation Plan contains nine recommendations within the Five-Year Action Plan:

- 1) Protect [undeveloped open space] corridors [for wildlife and recreation];
- 2) Formalize a town trail system;
- 3) Manage recreational boating at Lake Wyola for compatible multiple uses (*see town boating bylaw approved in 2003*);
- 4) Research establishing a community gathering place;
- 5) Promote town open space and recreational opportunities and solicit feedback on needs;
- 6) Fundraise to improve playgrounds;
- 7) Develop a recreational program that includes community dances, theater and concerts;
- 8) Develop educational material through the library on how to safely interact with wild animals; and
- 9) Improve/enhance recreational facilities with reference to the Shutesbury Americans with Disabilities Act Transition Plan. Recreation facility needs include upgrading existing sports fields (e.g., the school and fire station fields), the boat ramp at Lake Wyola, and the horse ring; and developing new facilities (e.g., full-size basketball court, playground, tennis court, outdoor skating rink, bandstand/pavilion; bicycle racks, benches, and picnic tables).

The Recreation and Open Space Committee may require additional leadership to coordinate volunteers already committed to providing diverse recreational opportunities for all residents in a manner that builds community spirit. Most of the Open Space and Recreation recommendations will likely require some funding to complete. This funding could come from the Urban Self-Help Program through the Massachusetts Division of Conservation Services, from private foundations, and from local fundraising.

Leadership needs are not unique to Shutesbury. Many small towns in the Commonwealth depend on the willingness of a relatively small number of citizens to provide municipal service oversight. Involving citizens of all ages in support of enhancing public benefits, whether that be through trash cleanup, trail development, or playground repair can instill a greater sense of community and give people a chance to practice being leaders on small projects.

Management Plans Needed for Some of the Undeveloped Unprotected Town Lands

There are a number of undeveloped town-owned parcels that are currently under the authority of the Select Board; their future use is yet unknown. Some of these parcels could very well be used for recreational uses, while others might be needed for school, safety, or town office expansion. It may be worthwhile for the town to proactively investigate the potential uses of these various parcels and decide which should be protected from development, which might be managed as active recreational areas, and which might be used for future municipal facilities. If a site has been identified as best set aside for long-term infrastructure expansion, it may then be possible to assign it a recreational use for the short-term given that no significant investment of time or funding would be required.

Trails and a Trail Summit

The Community Survey results demonstrate the desire among many residents for a system of trails. Overall, 80 percent of survey respondents stated that forests and trails were very important to their satisfaction with living in Shutesbury.

The Recreation and Open Space Committee has investigated the feasibility of organizing a trail summit, which would bring together landowners, members of the local snowmobile club, cross-country skiers, town board and commission members, and other interested parties to discuss how a trail system could be developed throughout town. The summit was never held because the Committee thought that discussions of a town-wide trail system would be too controversial.

Currently, there are trails on private lands, on the South Brook Conservation Area, in the Shutesbury State Forest, and on Amherst Water Supply lands. The Metacomet-Monadnock and Robert Frost Trails cross a small section of Shutesbury. In addition, informal trails on Quabbin and Amherst water supply protection lands and private lands access forests, hunting grounds, woodlots, and scenic outlooks. There is the potential for developing trails throughout town but how it will be accomplished may take time and the collaboration of all interested. For example, the 18-mile Tully Trail, which links portions of Orange, Warwick, and Royalston, was developed by employees of state conservation agencies that had abutting properties. Later the trail was developed to link newly protected lands. Then the Executive Office of Environmental Affairs used the loop trail as a target for a two-year massive investment of over nine million dollars to purchase conservation restrictions to protect the trail corridor in perpetuity. The trail, as it is today, was built via a partnership of many organizations. Public access was purchased from willing landowners. Almost the entire trail is protected as open space today.

The Recreation and Open Space Committee could take a long-term approach towards establishing trails for different uses within town. Management of existing trails on private lands are often determined via relationships between landowners and users like hunters or snowmobilers. Trails on publicly owned land, especially town-owned land, may be managed best by a more inclusive body. By developing a management plan via a consensus-based planning process, trail use on town lands may be identified and promoted more effectively to the satisfaction of a wide variety of trail users. Otherwise, trail use between different (e.g. motorized and non-motorized) users will continue to be divisive.

Town Library Services

The M. N. Spear Memorial Library's dual purpose is to provide popular materials to residents and to be a place where library materials, facilities and equipment are available in support of the social, cultural and recreational activities of the community. As of 2003, the Library has the following materials available for loan: books (approximately 9,600), periodicals (60 volumes), books-on-tape (380), and videocassettes (1,250). It also provides a reference service through which residents can seek information from Library staff in person, over the phone or via email. The Spear Memorial Library provides access to the materials of all Western Massachusetts libraries, as well as other regional libraries through the Western Massachusetts Regional Library System (WMRLS). In addition, the Library provides access to the Massachusetts Library Information Network (MLIN) catalog and the Internet.

Cultural programming at the library includes activities for children, adults, and for families. The Library staff and volunteers schedule programs during the summer months including a Children's Story Hour, a Fishing Season Kick-off Day, the Summer Reading Program activities, a Book Discussion Group for Adults, and Twilight on the Green, a music program funded by the Mass Cultural Council. The library provides a Bulletin Board, and submits library news to both the school and town newsletters.

The Library is a valued institution in Shutesbury that has earned the support of patrons and volunteers throughout its history. The town's first Public Library was contained within a single bookcase in 1811, and residents voted to establish a "Free Library" in 1894. The Free Public Library was originally located in a town residence until the present building was erected in 1902. The present Library building was made possible through a bequest of \$1,500 by Mirick N. Spear of Amherst. In 1934, the library received an endowment for its maintenance in the form of forty-five shares of American Telephone and Telegraph stock, willed by William N. Spear of Springfield.

The Library is currently supported by three volunteer entities including the Board of Trustees, consisting of six elected officials; a small cadre of adult and teenager volunteers; and the Friends of the Library, which represent 150 families that provide additional funds in support of library programs. The Friends also assist the Board of Trustees and the Library Director to organize community events and programs.

The Library's importance is also reflected in the fact that it is heavily used by young families, adults, and elementary school-aged children. According to the 2002 Annual Report, the Library is used by over half the households in town at least once per month, which places it within the top ten of all libraries in Massachusetts towns of 2000 people or less in terms of circulation, patron visits, and attendance at events. Though some retirees use the library frequently, older and disabled seniors have difficulty negotiating the parking area and the stairs.

Library Issues

Lack of Space

The most important issue facing the library is lack of space. The Massachusetts Board of Library Commissioners recommends that a town library have approximately two square feet of space per resident, plus additional room for future growth. That floor space recommendation is for an average-use facility, and the Spear Library is much more heavily used. With a 2000 population (U.S. Census) of 1,810, Shutesbury should have a library with a minimum of 3,600 square feet. The present building has 900 square feet.

To truly serve the town, the library needs to have a children's room, a teen homework area, more public computers, and a public meeting room. There should be a space to sit and read quietly, and a reference section. It should also have a work/storage room, an office, closets, a vestibule, rest room, and be universally accessible. The collection expands at a rate of thirty to forty items each week. Given the library's current space limitations, for each item purchased, an old one must be removed.

Keep the Planning Process on Track

Overall, 54 percent of the 2000 Master Plan Survey respondents reported that they felt it was either important or very important for the town to have a new expanded library. One of the main hurdles to expanding library services in town may simply be the need to keep the planning process on track to completion. The Library Building Committee, which began to meet in November 2001, selected a potential site for a new library: behind Town Hall. An engineering study had been developed earlier for the area. The Library Building Committee disbanded as their job was complete and the engineering study now needs to be updated. There needs to be continued efforts towards gaining consensus on when and how library construction should occur.

Collaboration of Multiple Boards and Committees

Developing an expanded library would require the collaboration of many town boards and committees. One entity, possibly the Library Trustees could take a leadership role. However, to choose an architect, study the financial feasibility of funding a new library, and determine the kinds of facilities that should be in a new library (meeting space for committees, computers, copiers, audio-visual materials), will likely require open and fair discussion time for all interested parties.

Council on Aging

The Shutesbury Council on Aging was established to assist the town in providing services to the senior citizens of Shutesbury. It is considered here since the dominant activities of the Council have typically focused on facilitating a weekly luncheon club providing companionship among seniors. The Council also participates in a yearly flu clinic with Leverett seniors. The luncheon program has been active over the past two years. However, many of the luncheon club participants appear to be Leverett residents. The Council's current level of activity appears to be less than it has been in years past.

Issues

A More Active Council on Aging Could Benefit Shutesbury as a Whole

One reason the Council on Aging may not be as active now, as it has been in the past, could be because the number of senior residents in town may be perceived as being too low to warrant a fully active Council on Aging. It might also have to do with the amount and variety of services offered. However, over the past decade the number of seniors in Shutesbury increased by 10 percent. In addition, the number of Shutesbury residents 45 to 64 years of age increased 179 percent between 1990 and 2000 (from 200 to 558), which may mean that over the next twenty years, a larger percentage of the population will be seniors. Do seniors stay or leave based on the services provided by the Council on Aging? Probably not, but were the town to support the Council to become more active in representing the interests of seniors in Shutesbury and in providing the services most needed, more seniors may be interested in being involved in community affairs and on volunteer boards and committees, which benefit themselves and all residents.

Recreational and Cultural Facilities and Services Recommendations

- **The Recreation and Open Space Committee could form a Trails Subcommittee.** The work of the Trails Subcommittee could be to: 1) study the feasibility of developing a network of trails throughout town, share the report with others and use the process as a means of generating some consensus on the most controversial topics; 2) develop a protocol for choosing which trail uses would be best allowed on each town-owned property; 3) develop and maintain trails on town-owned lands; and 4) work with the ADA Committee to improve/create accessible trails.
- **Develop the Fire Station soccer field as the town's main sports field facility.** Due to the fact that the school sports field has significant issues (i.e. it is contained within the school well's interim wellhead protection area), the large field behind the Fire Station may be the best choice for investment. Outside of Lake Wyola and the network of trails in town, this field area could be the most actively used outdoor recreational facility in

town. It is the only town owned land with an existing, level field. The field and facilities could be improved to increase the quality and variety of recreational activities, which could occur on the site.

- **Promote afternoon and weekend use of the Shutesbury Elementary School Playground.** The Shutesbury Elementary School possesses the largest set of playground structures in town. Instead of constructing a new playground complex on town land, residents should be encouraged to use the school’s playground. The increase in use over time will help support much needed upgrades to equipment and access.
- **Build a new library.** The Library Trustees will request the Select Board to establish and appoint members to a Library Building Design Committee. The Building Design Committee would then be responsible for initiating and facilitating a successful planning process that would lead to a town-approved design and ultimately, construction of a new library.
- **Support the Council on Aging to survey seniors in town to determine which recreational and cultural services would be most desirable.** The Council on Aging could work together with the Recreation and Open Space Committee to develop and administer a survey targeted to seniors to determine which types of recreational and cultural services they would most likely participate in, were they to be offered in town.
- **Investigate potential alternative meeting spaces for seniors including the Elementary School and the Shutesbury Athletic Club.** The Council on Aging provides recreational and cultural services to seniors, which is a growing segment of the local population. Though the kitchen area of the town hall may be adequate for Tuesday luncheons, other sites may be more conducive to other types of fun and enriching events.

Highway Maintenance

The Town of Shutesbury provides residents with well-maintained roadways. When asked what residents would like to see happen over the next ten years, 59 percent of the community survey respondents felt it was important or very important to increase road maintenance. The 2000 Master Plan Goals and Objectives included the following high priority objectives:

- Encourage the adoption of best management practices in all Town departments, especially for the use of road sand and salt by the Highway Department.
- Identify the level of road maintenance sought by Shutesbury residents and ensure that any roadway upgrades balance safety considerations with neighboring rural character and town-wide network needs.
- Identify and address the long-term needs of the Highway Department including facilities and space.

Although these objectives are also addressed within the Transportation Chapter of the Shutesbury Master Plan, the following section describes the services and facilities of the Highway Department and its space and staffing needs.

The following information is based on a phone interview with the Superintendent, Timothy Hunting, in December of 2003 and on the 2002 Annual Report of the Town of Shutesbury.

The Shutesbury Highway Department provides general road and street maintenance year-round. The Department maintains all town roads, replaces culverts, does street sweeping, plows snow, applies sand and salt to icy roads, and performs tree trimming and brush removal as well.

The Highway Department carries out its duties using standard equipment and a small staff. The Department maintains trucks, tractors, and a variety of equipment used for specific purposes. The trucks include a 2000 Chevy 2500 four-wheel drive truck with a plow, a 1996 Ford F350 one-ton truck with a plow and a sander, a 1987 Mack six-wheel dump truck with a plow, a 1998 International six-wheel dump truck, and a 2003 Sterling ten-wheel dump truck. In general, the trucks are in good condition though ideally they would be replaced every twelve years. The Department however, has been able to stretch the life of some vehicles through refurbishment, depending on the condition and use of the vehicle.

The Department's 1983, 2150 John Deere tractor is still in relatively good condition, despite being twenty years old. Other equipment includes a 1995 Case 621B front-end loader, a 1987 Caterpillar grader, a 1990 JCB 1400B backhoe, and a new fork-mounted snow thrower. Equipment may get replaced only when repairs are so frequent that it becomes cost efficient to buy a new or used replacement. Mr. Hunting projects that the backhoe may need to be replaced within the next five years, and the tractor sometime between five and ten years.

The Highway Department currently has the use of a steel pre-fabricated garage, built around 1970, with three bays. The lot, upon which the garage is located, is on the northern side of Leverett Road and is approximately 2.3 acres in size. Mr. Hunting's office has been used as a storage room in the past, yet is reported to be currently adequate. In the winter, each of the three garage bays holds a dump truck with a plow. There is very little extra room within the bays while the trucks are inside. All other vehicles are stored outside, covered, but relatively vulnerable to changes in humidity and temperature. Much of the surface of the lot not taken up by buildings is used to store equipment, plows, and gravel.

A separate wooden shack in back has a metal roof and is unheated. In the last large bay of the shack, the Highway Department constructed a salt shed to hold an extra load of de-icing salt. The extra salt is needed to allow the Department the flexibility to match its salt-sand mixture with shifting winter weather conditions. The recently constructed salt shed out front is used to hold a load of salt-sand. The salt is trucked from a company in Chelsea, the sand from Warner Brothers in Sunderland. The salt is the limiting factor and explains why the Department purchases two loads at a time and why limited interior space is used to store salt.

The Highway Department has three full-time staff: the Superintendent and two other employees. Although the Superintendent might be hard pressed to keep another full-time employee busy through most of the year, the Department is interested in exploring how to hire seasonal summer help as well as ensuring access to enough adequately skilled snowplow drivers in the winter.

Highway Department Issues

The Highway Department May Require an Expanded or New Facility in the Near Future

According to the Superintendent, the Department is using the lot's full capacity in terms of interior and exterior space. The Superintendent has chosen to not order certain equipment because it would need to be stored outside. Some equipment such as plows can be stored outside but any equipment with an engine should be inside to ensure maximum use along its entire life. As equipment needs grow and as the population of the town increases, there will likely be an even greater need for more storage space.

Expansion on the Current Lot Appears to be Constrained

The approximate space needs equal at a minimum 150 percent of the Department's current lot or 3.5 acres. Expanding the garage to the south towards Leverett Road is constrained by the front yard setback, which is seventy-five feet measured from the street line. According to the Superintendent, the lot may also be constrained to the north by wetland. In addition, the area to the west and east of the garage is currently used for storage, and the salt shed out front may already be within the twenty-five foot side yard setback.

Existing Equipment Needs

The Highway Department is currently in need of three pieces of equipment: a flatbed trailer, a flail or rotary mower attachment for the tractor, and a brush chipper. Currently, the Department borrows a local contractor's trailer to move equipment when it is available. Tires on tractors, loaders, and backhoes tend to wear out sooner when used on paved surfaces. According to the Superintendent, the trailer would be a good investment. Likewise, the rotary mower attachment for the tractor would allow the Department to be able to do a much more effective job of clearing roadside brush. The Department would also like to buy a brush chipper instead of continuing to rent one from a local contractor

Staffing Needs

According to the Superintendent, the Department has been interested in acquiring seasonal help in the summer and winter. In the winter months, Mr. Hunting tries to have at least four employees working during each storm event, which requires bringing in one extra person and possibly a second. The pool of skilled and available snowplow drivers is lacking. The Highway Department might consider discussing the administrative process employed by the Town of Leverett to hire summer highway laborers.

Highway Department Recommendation

- **The community should develop a plan to address the Highway Department’s space needs with the assistance of a Select Board-appointed Ad hoc Committee.** Like the Police and Fire Departments, the Highway Department may want to address issues with the assistance of the Select Board because their resolution may involve town funds to purchase additional land and to construct an expanded facility.

Potential Community Facilities and Services Expansion

The Town of Shutesbury is a small rural town that has seen its population nearly quadruple in the past three decades. Since 1970 the town’s population has grown 270 percent from 489 to 1,810 in 2000. The town is in the process of upgrading the Town Hall by making it accessible based on the Americans with Disabilities Act. The Conway School of Landscape Design’s Town Center Plan proposes that a new and expanded library be built adjoining the back of the Town Hall. Although expansion of existing facilities may not be immediately critical, the town needs to consider how to most effectively plan for expansion in the future given projected population growth. Expansion of facilities can require additional land, capital, and the political will of residents to support change. Changes in the way a community’s institutions develop can happen more smoothly over time with ample public discourse. The Master Plan can assist the town by providing a framework for public discussion.

In this section, potential future community facilities expansion is presented in discussions of three main topics: potential for community wastewater treatment, potential for community drinking water supplies, and the need for additional town owned land to support expansion of facilities and services. The Master Plan Goals and Objectives include two *high priority* objectives developed from the Community Survey results that deal directly with the issues of expanding community facilities and services:

- Pursue state financial assistance to identify potential future ground water supplies and Zone II recharge areas (the land surrounding a groundwater supply, which represents the biggest area that contributes water during an extended dry period without precipitation), as well as technical assistance to develop resource protection strategies.
- Determine the feasibility of acquiring more Town-owned land for the purpose of expanding existing community facilities like [the Highway Department garage], the school, library, Town Hall and police and fire buildings and for the development of potential future needs such as sports fields, wastewater treatment and drinking water filtration plants.

Potential Community Wastewater Treatment

At present, all homes and institutions in Shutesbury use on-site septic systems to treat their wastewater. According to William Elliott, current chair of the Shutesbury Board of Health, there are two areas in town that could be considered for community wastewater treatment in the foreseeable future: Lake Wyola and the town center. Community wastewater treatment is presently being considered by the Lake Wyola Advisory Committee (LWAC, a town committee created by the Select Board), and has been endorsed in principle by the Lake Wyola Association (the homeowners' association). LWAC has created a subcommittee to investigate potential wastewater solutions for the area. It should be noted, however, that the interest in community wastewater treatment for this area is strictly proactive; it is not a response to any existing septic system contamination, of which there is thus far not the slightest evidence. See the sections in Chapter 1 regarding Lake Wyola.

Community wastewater treatment facilities typically involve systems that collect, treat, and dispose of wastewater from a number of residential, commercial, institutional, or industrial generators. There are many different types of systems that vary in size, treatment process, and disposal methods based on a number of factors including the volume of wastewater treated per day, design capacity of the facility, the amount of land available, and the location of the facility relative to surface waters and drinking water wells.

The building of a community wastewater facility, which releases the constraints of Title 5 with respect to the separation between wells and septic systems, frequently prompts a reconsideration of zoning in the affected area. It is theoretically possible, then, that the town could choose to permit increased residential density in the lake area. In practice, however, this is unlikely, given a number of constraints: the tiny size of the lots, many of which are a mere 40 feet by 100 feet; the environmental sensitivity of the area; and the stated preference in the master plan survey to preserve Shutesbury's rural character.

Another location that might be considered for a community wastewater treatment facility in the future might be the Town Center, which is an area of town depicted in the Context section on Sheet 3 of the Conway School of Landscape Design's (CSLD) Town Center Plan developed by graduate students in 2002. The area shown includes the lots north and south of the Leverett/Cooleyville Road west of the M.N. Spear Memorial Library to the Highway Department lot.

Currently, the Town Center represents the highest concentration spatially of community infrastructure in Shutesbury and includes the Post Office, Library, Town Offices, and Police Department. If a new expanded library gets built in back of the Town Hall, as is proposed in the Town Center Plan, and the existing Spear Library building becomes re-used as meeting space for example, this area could strengthen the town's cultural and social hub. The new library may be a good destination for a local trail system. Quabbin Watershed lands now managed by the Division of Watershed Management abut the newly acquired town lands south of the Town Hall. There may be a potential for trails through the Quabbin Watershed Lands to the south and east.

Community infrastructure expansion in the vicinity of the Town Center could also be supported by a community wastewater treatment facility. Future improvements to the Highway Department and the Fire Station facilities might also result in even more concentration of institutional uses if they were built together on the new town land for example or on adjoining lots were they to become available for these purposes. Combining services in one larger structure may be less expensive.

Potential Community Drinking Water Supplies

If the town can acquire land to protect its aquifers, it should do so whether it expects to develop a community water supply or not, according to the Chair of Shutesbury's Board of Health, William Elliot. As is discussed in the Natural Resources and Open Space Chapter, the town has low-to-medium yield aquifers around Lake Wyola and Ames Pond, Dudleyville marsh, the West Branch of the Swift River, Roaring Brook, and Dean Brook. The town may consider protecting these aquifers through land protection and zoning. One way to ensure future access to existing aquifers is by protecting the lands that could contain wellhead protection areas in advance of development.

The Franklin County Regional Water Supply Study (2003) developed by the Franklin Regional Council of Governments identified areas of land atop estimated aquifers without constraints for wellhead protection areas. The study based its analysis on a model developed by the U.S. Geological Survey in cooperation with the Cape Cod Commission in the mid-1990s, which is summarized in "Water-Resources Investigation Report 94-4156, Identification of Potential Public Water-Supply Areas of the Cape Cod Aquifer, Massachusetts, using a Geographic Information System."

Identifying the best location for a new community well site is dependent on two main types of requirements. The first type has to do with the capacity of the water source, the aquifer, to provide clean water of a volume and flow required for a community water supplier. The second set of requirements concerns allowable land use within the Zone I wellhead protection area, which is an area of land with a radius of between 100 and 400 feet from the potential well site. Any well that pumps at least seventy gallons per minute (100,800 gallons per day) must have a Zone I radius of 400 feet. DEP requires that towns own the land within the Zone I of all new sources. The land within the Zone I cannot be used for any other purpose than for water supplies.

In addition, some land uses including brownfield sites that involve contamination of the groundwater or soil would restrict the location of a future well. In that case, a new source could not be located within one-half mile of a brownfield site. The half-mile distance is consistent with the radius of the interim wellhead protection area, which is required for public water supplies that do not have their Zone II recharge areas delineated.

Wells developed for community water supplies must be of significant volume to balance the cost of exploration and establishment. DEP personnel have estimated that new community water supply wells can cost several million dollars to bring on-line. Without research by

hydrogeologists, the location and quantity of water available from different aquifers in the region may be known only through drilling tests.

The USGS/Cape Cod model used GIS to determine the locations of potential Zone I wellhead protection areas that towns could acquire for future water supply source development. The model developed a set of land use-based constraints and other factors that were excluded from Zone I areas by state law: restricted use lands, wetland zones, developed land uses, and the potential saltwater intrusion zone. The Franklin County Study adapted this model to the region by excluding a saltwater intrusion zone and by making other modifications to the selected criteria list:

The restricted use category comprises all protected open space, including lands under the jurisdiction of the Conservation Commission (such as the South Brook Conservation Area), but not including town-owned open space. The permanently protected open space coverage was then buffered by 400 feet to reflect the requirement that only land uses and activities directly related to water supply are allowed in the Zone I.

Both the USGS/Cape Cod model and the Water Supply Study buffered all surface waters and wetlands by 100 feet consistent with the regulations imposed by the Massachusetts Wetlands Protection Act, which restricts activities in all wetlands and within a 100 foot buffer zone that extends horizontally from any wetland.

Both the USGS/Cape Cod Model and the Water Supply Study buffered the following MassGIS land use coverages by 400 feet:

- Power lines (this was created as a coverage separate from the open land MassGIS coverage;
- Cropland, golf, pasture, spectator recreation, urban open, woody perennial (orchards and nurseries);
- Residential, commercial, and industrial land uses;
- Mining, waste disposal, and all transportation uses including all roads and railroads.

The groundwater contamination zones criteria including Chapter 21 E hazardous waste sites, underground storage tanks, solid waste disposal sites, and landfills were buffered by 2,640 feet (1/2 mile).

The fold-out GIS map, Identification of Potential Water Supply Areas for Franklin County: A Composite of Constraints to Potential Zone I Wellhead Protection Areas, shows all the constraints to Zone I areas aggregated in red (*see Identification of Potential Water Supply Areas for Franklin County: A Composite of Constraints to Potential Zone I Wellhead Protection Areas map at end of this chapter*). There are no limitations on the siting of new wells where white shows through on the maps. The white areas of the map hatched in light blue (low-medium yield aquifer) or dark blue (high yield aquifer) represent unconstrained lands, which could potentially provide access to underground water supplies. Of all the land within Franklin County, these areas could potentially be the best locations for developing future community public water supplies. The Community Facilities and Services Map identifies potential future community

water supply protection areas in four of the five aquifer zones mentioned earlier (Lake Wyola, Dudleyville marsh, Roaring Brook, and Dean Brook).

Need for Additional Town Land to Support Community Facilities Expansion

Although the Master Plan Goals and Objectives list as a high priority the task “to determine the feasibility of acquiring more town-owned land for the purposes of expanding existing community facilities...” this may not be as critical as the need to estimate future land needs of existing facilities. The town was recently successful in acquiring nearly ten acres of land abutting the Town Hall. The acquisition was the result of a letter sent out by the Select Board to landowners, town-wide stating that the town was interested in purchasing land for community needs.

The purpose of this section of the Master Plan is to introduce a preliminary assessment of existing town-owned unprotected and undeveloped land and to initiate a discussion of the potential future land needs of municipal services: Library, Police Department, Fire Department, Elementary School, Highway Department, Recreation, Community Wastewater Treatment and Community Drinking Water Supplies. The information presented in this section comes mainly from Shutesbury Assessor’s maps and lists, an inventory completed by resident Janice Stone in support of the Recreation and Open Space Committee, interviews with town officials, and field visits to a select set (33 of the 37 acres) of these parcels by Franklin Regional Council of Governments Planning Department staff.

Potential Land Needs for Expansion of Community Facilities

Library

According to the Conway School of Landscape Design’s (CSLD) Town Center Plan, the best location for a new library would be adjacent to, and in back of, the existing Town Hall. Based on the CSLD’s drawings, the footprint of the proposed library and the joint parking area would use less than an acre of land behind the Town Hall.

Police Department

If a feasibility study documents the need for additional space within a Police Station where Department officers could bring in, question, and process witnesses and prisoners, would it make more sense for the department to develop additional space within the Town Hall, or construct a new police department building? It may make sense to study whether the Police Department’s potential space needs could be served by developing a combined police and fire safety complex.

Fire Station

The Fire Department has no short-term space needs. In the long-term, a brush truck, trailer and new tanker could require additional garage bays. As the town’s population grows, there could be a need for more than one full-time staff person. The town might consider the feasibility of developing a shared police and fire safety facility, which would save the town from unnecessary costs and aid in inter-departmental communication.

Shutesbury Elementary School

According to Tari N. Thomas, Principal, there are no short-term space needs at the Elementary School. The school's enrollment dropped from 203 to 152 students, not including pre-school children between fiscal year 2002 and 2004. This is a trend shared by many communities in the region. However, over the past decade school enrollment in Shutesbury has increased from 166 students in 1990 to 204 in the year 2000. Due to the expected trend of a slow decline in elementary age children in Shutesbury, it is not expected that a new school will be needed in the next 10 years.

To plan for the long-term expansion needs of the Elementary School beyond the next decade, town officials need to determine whether the school can use land abutting its existing footprint. One issue that relates to this is the potential need for a cafeteria. The Shutesbury Elementary School's renovation was completed just before the requirement for a separate cafeteria was instituted.

Another issue that impacts the town's capacity to expand the elementary school facilities relates to the fact that almost the entire school property lies within its drinking water supply's interim wellhead protection area (IWPA). The school has two public water supplies, one of which is its emergency supply. The emergency well, which was the school's original well, is located nearest to the school building. Even though the emergency well is no longer used, it is part of the school's public drinking water supply system. The land within the Zone I's of the school's emergency well and active well cannot be used for purposes other than passive recreation.

The town may be able to increase the capacity of the school by restricting new construction to the existing footprint. However, if increased enrollment resulted in on-site septic system effluent exceeding 2,000 gallons per day, the school would need to institute nitrate reduction because the well's IWPA is nitrate sensitive. In the future, if the town is interested in expanding the school footprint, the town should speak with DEP staff to determine the best approach.

Highway Department

The Department is already using 100 percent of its available interior and exterior space on a lot that is too small to expand upon due to zoning and wetlands. Ideally, if an adjoining one-acre lot could be acquired, the existing buildings could continue to be used for equipment storage. The alternative would be to locate another lot on level ground near the center of town that is at least three and a half acres in size.

Recreation

The town contains several sports fields of varying conditions: Fire Station, Elementary School, and to a much lesser degree, in back of the Town Hall. The Elementary School field, while adequate for some sports would require renovations that are constrained by the field's proximity to the school's water supply. The Fire Station field appears to be the best choice for investment as a sports field complex. Although the town may not have a critical need for additional land for recreational use, it could receive more land in advance of a specific need. Later when residents express a strong desire for a particular facility like tennis courts, the Recreation and Open Space Committee would be in a better position to succeed in developing the new facility in a cost effective manner.

Future Community Wastewater Treatment Facilities

The exact amount of land that would be needed for a wastewater treatment facility around Lake Wyola has not been investigated by the LWAC as of yet. Assuming that the treatment method involves subsurface discharge of treated effluent, land would be needed to process the wastewater. It would be useful to know the ideal site characteristics for such a facility so that town officials can be prepared to take advantage of opportunities to acquire land fit for that purpose.

Future Community Drinking Water Supplies

The aquifers underlying forested areas around Lake Wyola, Dudleyville marsh, Roaring Brook, and Dean Brook may be the most promising areas in town for future community drinking water supplies (see the *Community Facilities and Services Map*). To ensure these groundwater resources are conserved for the future, the town could develop an aquifer protection zoning overlay district. The boundaries of each overlay district could coincide with the estimated aquifer and its likely recharge area. The overlay district could be designed to lessen the impact of future development by increasing the minimum lot size, by restricting the amount of impervious surfaces created and the types of land uses allowed, and by limiting the amount of vegetation removed, etc. The town could prioritize for acquisition those forests that are found within the potential wellhead protection areas in advance of the need for a community water supply. The town could also hire a hydrogeologist graduate student or a professional hydrogeologist to measure the safe yields of existing aquifers in town, which could help determine which aquifers would best support a future community water supply.

Selected Undeveloped and Unprotected Town Owned Land

Currently the Town of Shutesbury owns approximately 37 acres of undeveloped and unprotected land (see *Open Space Map* and the *Community Facilities and Services Map*). Of these, 32 acres are in parcels that may have a potential for a use other than open space. Lands under water and the Town Pound, for example, are not included in the assessment below. Table 4-3 describes the location of each parcel and the Assessors Map, Lot, and acreage. Many of these parcels are less than a tenth of an acre in size and surround Lake Wyola (12 of the 19 lots). They are described in more detail following the table.

Table 4-3: Selected Undeveloped and Unprotected Town-Owned Open Space

Map Letter	Location of Town Land	Assessors' Map #	Assessors' Lot #	Assessors' Acreage
A	Lake Drive rectangular lot	B	10	0.1
B	Oak Knoll rectangular lot	B	22	0.1
C	Great Pines Drive rectangular lot	B	27	0.1
D	Lock's Pond Road rectangular lot	B	153	0.1
E	Great Pines Drive rectangular lot	B	167	0.1
F	Great Pines Drive rectangular lot	B	169	0.1
G	Watson's Straits triangular lot	B	524	0.1
H	Lake Shore Drive rectangular lot	B	661	0.1
I	Lakeview Road rectangular lots	B	709,710	0.2
J	Wendell Road Lot	M	30	8
K	Town Soccer Field Behind Fire Station	O	37, 38	3

Map Letter	Location of Town Land	Assessors' Map #	Assessors' Lot #	Assessors' Acreage
L	McNeil Land behind Town Hall	O	43, 48	9
M	Town field behind Town Hall	O	47	3
N	Elementary School Playing Fields and Woods	T	78	8
	Selected Shutesbury Undeveloped Unprotected Land			32.0

Source: Town of Shutesbury Assessors Records; 2002.

The future uses of these lots may depend in part on whether Lake Wyola neighborhoods are served by a community wastewater treatment facility in the future. In the mean time, their potential uses could be as undeveloped open space, developed park space, or they could be sold to abutters to generate revenue for the town. If a wastewater treatment facility is supported and initiated, the town may choose to hold onto the parcels around the Lake to capture any increase in value associated with a lot's new development potential.

A, B and C: Parcels B-10, B-22 and B-27

The picture on the right is the view looking eastward toward parcel B-27 (4,000 sq. ft.), which is located at the intersection of Great Pines Drive and Oak Knoll. Oak Knoll appears to be a paper road. Abutting lot B-27 is lot B-10 (5,000 sq. ft.) with frontage on Lake Drive. Both parcels slope gently east towards the lake. Lot B-27 act as a catch basin for silt and sand that erodes from Great Pines Drive, a gravel road. Lot B-22 (B), located off Oak Knoll, could not be identified.



D: Parcel B-153

Parcel B-153 is located off Lock's Pond Road immediately south of a residence and approximately 150 feet north of the entrance to Randall Road. The lot is approximately 5,600 sq. ft., wooded and level. The picture on the right is a view from Lock's Pond Road looking east at the parcel.



E: Parcel B-167

Parcel B-167 is located on the north side of Great Pines Drive abutting a house lot to the east, partially shown in the picture to the right. The 4,510-sq. ft. lot is mostly level, wooded and appears to be used to store brick, wood, etc.



F: Parcel B-169

Parcel B-169 is also located on the north side of Great Pines Drive and on the west side of King Road. It currently serves as the back yard of a house with frontage on Lock’s Pond Road. It is a level wooded lot also 4,510 sq. ft. in size. There is evidence of tree cutting but the bucked logs are neatly stacked.



G: Watson’s Straits Road Parcel B-524

Parcel B-524 is a triangular shaped lot with frontage on Watson’s Straits Road (no photo), which appears to be abandoned. The lot is wooded and level and within 150 feet of a residence off of Wendell Rd.

H: Parcel B-661

Parcel B-661 has frontage on Merrill Drive as well as on an unnamed gravel road that connects Merrill to Lakeview Road. The parcel is about 4,000 sq. ft. in size and with a parcel of the same size to the north, looks to be used as an informal dump for lawn cuttings and woody debris. Most of the parcel is wetland.



I: Parcels B-709 and B-710



Parcels B-709 and B-710 abut and are located south of Lakeview Road. The lots have residences to the northeast and west. The two town-owned parcels are level and mostly lawn with a wooded portion next to the road. The picture on the left is of a view looking west at the two parcels from the south side of Lakeview Road. Together the lots equal 8,000 sq. ft. according to the Assessor’s maps.

J: Wendell Road Lot Parcel M-30

All but one of the parcels not located around Lake Wyola are used for recreational purposes and are already described in this chapter. The exception is Parcel M-30, an eight-acre lot. According to the Assessor’s map, the wooded parcel with an eastern aspect is less than 500 feet from Wendell Road and is located behind recently built two-family homes. The lot also abuts protected open space owned by the MDC. It is important to note that 1) there is a legal challenge to the ownership of this parcel by an abutter and 2) there is no direct access to the parcel.

K: Town Soccer Field Behind Fire Station Parcels O-37 and O-38

Together these two parcels represent the largest town-owned open land that can be managed for active recreational use.

L and M: Land Behind Town Hall and McNeil Parcels O-43, O-47 and O-48

The land immediately behind the Town Hall may be used in part for the new library's leach field. The McNeil lands, further south, and abutting Quabbin Watershed lands, appear to be within an area designated as a BioMap Core Habitat by the Natural Heritage and Endangered Species Program.

N: Elementary School Playing Fields and Woods Parcel T-78

The DEP will not allow the school's playing field to be renovated because it is located within the interim wellhead protection area of the school's public water supply well. The future uses of the field and adjoining woods appear to be limited to passive recreation unless the town is willing to develop a new groundwater source in a different location.

Community Facilities and Services Expansion Recommendations (The first four recommendations are forwarded from previous sub-sections)

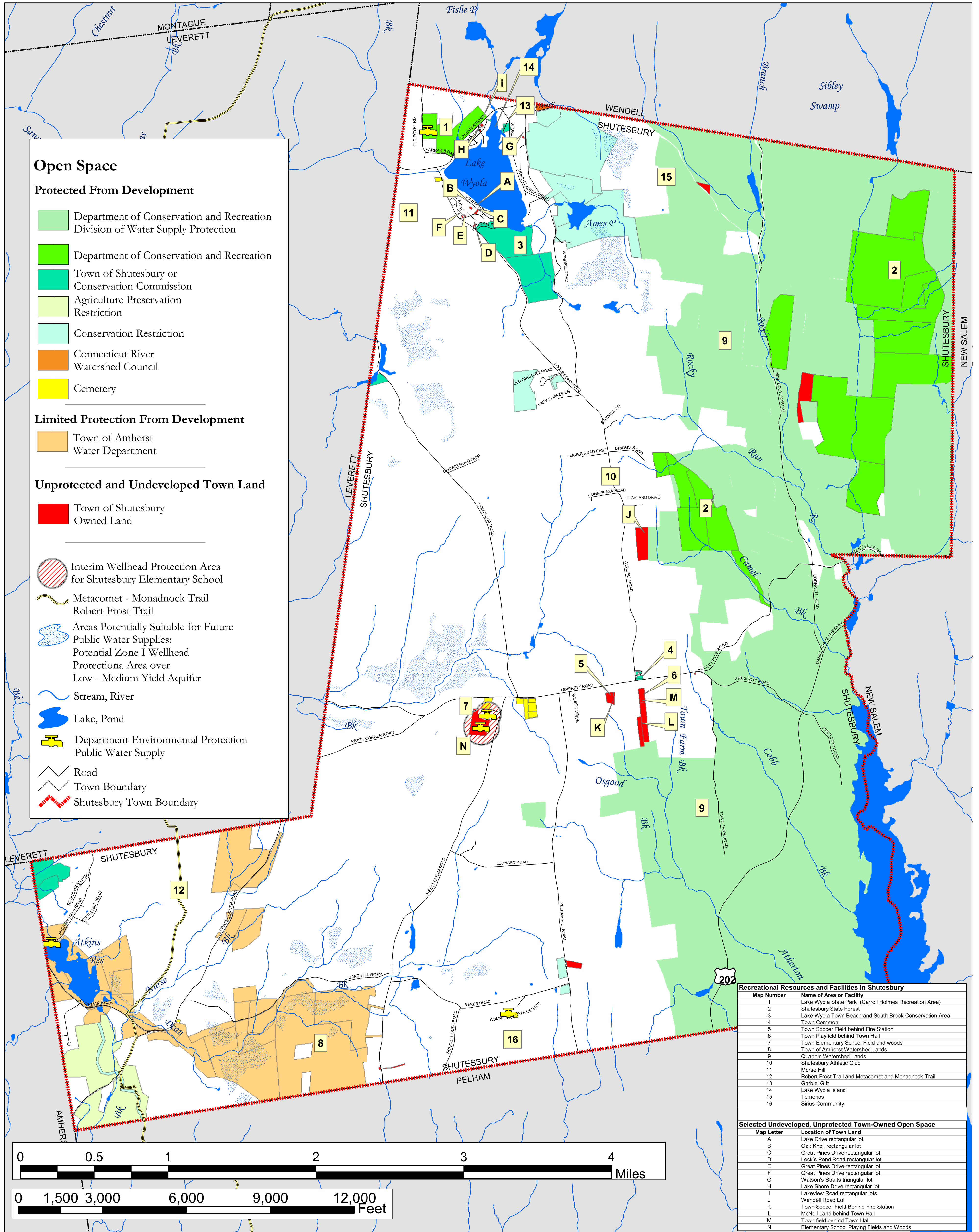
- **The community should develop a feasibility study that includes a comparison of needs versus services, which could also focus on determining appropriate solutions for any Police Department space and staffing issues.**
- **Develop the Fire Station soccer field as the town's main sports field facility.**
- **Build a new library.**
- **The community should develop a plan to address the Highway Department's space needs with the assistance of a Select Board-appointed Ad hoc Committee.**
- **Support the Lake Wyola Advisory Committee (LWAC) in its investigation of potential wastewater solutions for the Lake Wyola area.** The Select Board should continue to support the LWAC to determine which public wastewater treatment designs would be most appropriate for use within the Lake Wyola sub-watershed.
- **Actively maintain and manage the town-owned parcels in and around Lake Wyola in their current undeveloped states.** These town-owned lands can continue to act as a buffer to existing homes and may be useful in support of potential future public wastewater treatment needs in the area.
- **The Recreation and Open Space Committee may want to consider potential future water supply areas as a criterion for open space protection.** The Community Facilities and Services Map highlights areas of privately owned, unprotected forestland

located above estimated aquifers of low to medium yields. These potential future water supplies are among the few locations throughout the town that could be potentially developed for community drinking water supplies.

- **The Select Board should survey the existing and potential future space needs of all existing boards, committees, departments and commissions.** The Shutesbury Select Board could request all town boards and committees to submit current and potential future space needs to inform decisions concerning future community building expansion (e.g. the new library).
- **The community could explore the potential for the Shutesbury Elementary School to have an expanded role in support of town activities and functions.** Beyond potential future space needs, the Shutesbury Master Planning process identified interest among residents for further dialogue on the role of the Elementary School in the community today, and the possible ways in which the school could be a resource for all residents in the future.

Town of Shutesbury Master Plan

Community Facilities & Services



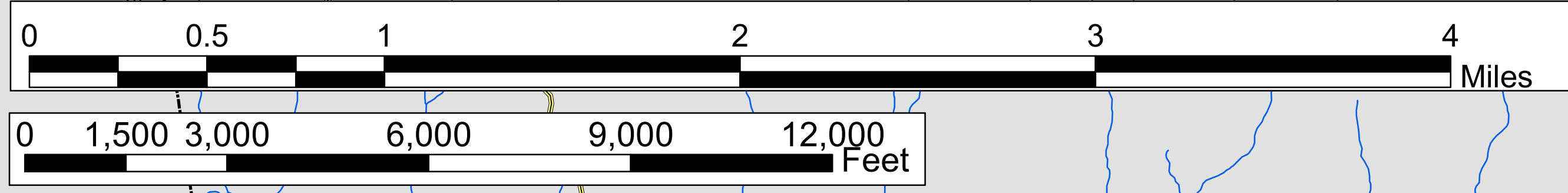
- Open Space**
- Protected From Development**
- Department of Conservation and Recreation Division of Water Supply Protection
 - Department of Conservation and Recreation
 - Town of Shutesbury or Conservation Commission
 - Agriculture Preservation Restriction
 - Conservation Restriction
 - Connecticut River Watershed Council
 - Cemetery
- Limited Protection From Development**
- Town of Amherst Water Department
- Unprotected and Undeveloped Town Land**
- Town of Shutesbury Owned Land
- Other Features:**
- Interim Wellhead Protection Area for Shutesbury Elementary School
 - Metacomet - Monadnock Trail
 - Robert Frost Trail
 - Areas Potentially Suitable for Future Public Water Supplies: Potential Zone I Wellhead Protection Area over Low - Medium Yield Aquifer
 - Stream, River
 - Lake, Pond
 - Department Environmental Protection Public Water Supply
 - Road
 - Town Boundary
 - Shutesbury Town Boundary

Recreational Resources and Facilities in Shutesbury

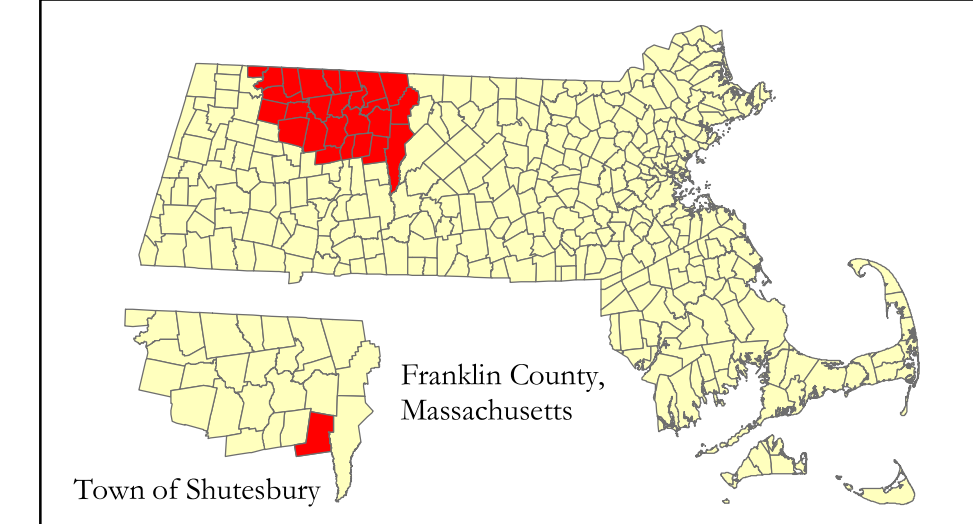
Map Number	Name of Area or Facility
1	Lake Wyola State Park (Carroll Holmes Recreation Area)
2	Shutesbury State Forest
3	Lake Wyola Town Beach and South Brook Conservation Area
4	Town Common
5	Town Soccer Field behind Fire Station
6	Town Playfield behind Town Hall
7	Town Elementary School Field and woods
8	Town of Amherst Watershed Lands
9	Quabbin Watershed Lands
10	Shutesbury Athletic Club
11	Morse Hill
12	Robert Frost Trail and Metacomet and Monadnock Trail
13	Garbel Gift
14	Lake Wyola Island
15	Temenos
16	Sirius Community

Selected Undeveloped, Unprotected Town-Owned Open Space

Map Letter	Location of Town Land
A	Lake Drive rectangular lot
B	Oak Knoll rectangular lot
C	Great Pines Drive rectangular lot
D	Lock's Pond Road rectangular lot
E	Great Pines Drive rectangular lot
F	Great Pines Drive rectangular lot
G	Watson's Straits triangular lot
H	Lake Shore Drive rectangular lot
I	Lakeview Road rectangular lots
J	Wendell Road Lot
K	Town Soccer Field Behind Fire Station
L	McNeil Land behind Town Hall
M	Town field behind Town Hall
N	Elementary School Playing Fields and Woods



FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS
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Map Sources:
 Map Produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, Massachusetts Highway Department, MassGIS and the town of Shutesbury.
 Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. EOEIA maintains an ongoing program to record and correct errors in the GIS data that are brought to or as to the implied validity of any use of the GIS data. EOEIA maintains records regarding all methods used to collect and process these data and will provide this information on request. Executive Office of Environmental Affairs, MassGIS EOEIA Data Center, 20 Somerset Street, 3rd Floor, Boston, MA, 01177-5227.
 Note: Depicted boundaries are approximate and are intended for planning purposes only.
 Roads data provided by Massachusetts Highway Department and MassGIS 1:5000; Town Lines, streams and lakes data provided by MassGIS; Open space parcel data provided by the Town of Shutesbury.
 *NILES Bus Map Cover Illustration
 *NILES Bus Map Supporting Natural Landscapes

CHAPTER 5

TRANSPORTATION

Transportation resources are the highways, roads, railroad tracks, bus routes, bike paths, and sidewalks that exist within a town. Their importance is often overlooked until there is a snowstorm, an accident, a traffic jam or other problem. Transportation resources affect people's daily lives as well as the ways in which their communities grow. When these resources are neglected or modified without consideration of the impacts, the results can have unanticipated consequences ranging from altered traffic patterns, pedestrian traffic problems, and safety issues. Shutesbury's transportation services and infrastructure are important resources for the Town, and deserving of assessment and enhancement.

Shutesbury is comprised of a network of neighborhood roads serving the town center and outlying rural areas within the town and in adjacent communities. A state road (Route 202) extends along the eastern side of Shutesbury through Massachusetts Department of Conservation and Recreation (MDCR) property. It provides access for Shutesbury to Route 2 to the north and Route 9 and the Massachusetts Turnpike to the south. Due to the town's rural nature, cars and pickups are the primary modes of transportation for town residents. According to the 2000 U.S. Census, 89 percent of Shutesbury's working population commute by car, truck or van to their place of work. Service vehicles provide services to town residents. There are an increasing number of large trucks passing through town. These are a diverse set of demands on a small rural road system.

A 1795 court ordered map depicts three roads in Shutesbury. Nineteenth century maps such as Wallings, Beers and the 1883 USGS map include many current public roads and many more roads that were discontinued by an October 30, 1973 Special Town Meeting vote. That vote listed "...roads in their present locations as the only public ways in Shutesbury..." and discontinued "...all other roads in Shutesbury to whatever extent they may now be town public ways..." The map accompanying that vote (Attachment 1 (*see Appendix F*)) was created by William Randall, a founding member of the Planning Board and Assessor for thirteen years. In 1979, the town signed a contract with Mr. Randall for him to continue his research and development of maps of Shutesbury. Although the Town does not have an official "Town Map," Mr. Randall's final, April 1999 version (Attachment 2 (*see Appendix F*)), is currently used by various town departments.

The roads of Shutesbury represent an important and integral part of our town's landscape, and the landscape of each home. The primary purpose of Shutesbury's roads is to serve the residents of our rural community. The town works constantly to balance the needs to maintain paved and

gravel roads and the budget realities that a small residential community faces. This report provides an objective and factual presentation of the existing transportation resources, the observed uses and the perceived needs. But it is critically important to recall the preferences of Shutesbury's residents when pondering transportation issues in the town and potential recommendations.

In preparation for developing the town's master plan, a survey was conducted during fall of 2000. Many questions and the resulting responses are important for any decisions regarding transportation. More than 95 percent of Shutesbury residents responding to the town survey said that the rural character of Shutesbury was either very important (77 percent) or important (18.5 percent) to them. Fields, forests and trails were important to 95.8 percent and peace and quiet was important to 97.6 percent of our residents. Residents live in Shutesbury because of the rural character and peace and quiet that the town offers. When asked what defines "rural character," residents identified forests, wildlife, and other natural resources and important characteristics. But many characteristic of transportation were also included. Dirt roads (71.6 percent), large roadside trees (88.2 percent), stonewalls and foundation holes (89.1 percent), narrow windy roads (76.1 percent), and low traffic volume/slow speeds (87.9 percent) were all important to Shutesbury residents in defining rural character.

Residents of Shutesbury are understandably concerned about any and all changes to our roads. Physical changes to the roads could potentially change the rural landscape that is so important to Shutesbury's residents. Are residents supportive of changes in our roads? While 19.7 percent said increased road maintenance was very important and 39.7 percent said it was important, only 25.1 percent responded that more paved roads were either very important or important. Furthermore, only 28.5 percent were willing to have their taxes increase to pay for increased road maintenance and just 12.7 percent would be willing to pay more in taxes for more paved roads.

An alternative position on roads, especially gravel roads, should also be considered. While the statistical data suggest we infer the populace is satisfied with the current mix of gravel and paved roads, our gravel roads pose a host of additional issues. Each spring there is a hue and cry over the dismal state of our gravel-turned-mud roads. They can become impassable with school buses refusing to travel down certain roads. Gravel roads require additional maintenance not needed on paved roads drawing heavily on limited labor and equipment resources. Erosion and run-off from gravel roads can contaminate wetlands and streams. In addition, it is impossible to post gravel roads with speed limits.

Residents of Shutesbury prefer a quiet, peaceful rural town with roads that fit that landscape. These roads should nestle nicely in the rural landscape and should not encourage high traffic volume or faster speeds. A majority of Shutesbury residents feel gravel (or dirt) roads are important to our rural landscape and are more supportive of efforts to maintain the existing roads than to improve roads through paving, but we must keep in mind the extra resources required to maintain gravel roads. When reviewing Shutesbury residents' preferences, it is clear why issues

surrounding roads, an integral part of our rural landscape, are so important. It is clear that changes in the local roads will be viewed with concern; concerns for the increased traffic flows that are contrary to residents' preferences, concerns for the increased traffic speeds that are also contrary to residents preferences, concerns about the loss of roadside stonewalls, trees and other historic and scenic amenities that are contrary to residents' preferences.

Goals:

- To maintain the condition of the road system in a manner that is compatible with Shutesbury's rural character.
- To maintain the pedestrian infrastructure.
- To maintain traffic patterns at key locations.
- To expand transportation choices for Shutesbury residents.

Objectives:

- Consider developing rural road design guidelines, where possible, to maintain the rural appearance of Shutesbury's road network.
- Improve access to existing walking/bike/running paths in Shutesbury.
- Address parking and circulation issues around the Town Common.
- Explore the development of local bus service to Amherst, Northampton, and Greenfield. Consider the need for parking, which would be associated with a park and ride facility.
- Make ride-share information more accessible to Shutesbury residents.
- Design and implement pedestrian safety improvements around the Town Common.

Road Infrastructure

Functional Classification

The categorization of roadways by "functional classification" was mandated under the Federal Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), and was completed in 1993 by MassHighway Planning working with the State's thirteen Regional Planning Agencies, including the Franklin Regional Council of Governments (FRCOG). Roads are functionally classified based on the service that they are intended to provide within the road network. According to the American Association of State Highway and

Transportation Officials (AASHTO) definitions, there are eleven road classifications, which can be grouped into the following seven categories:

- Interstate,
- Rural Principal Arterial and Urban Extensions,
- Rural Minor Arterials and Urban Extensions,
- Other Urban Principal Arterials,
- Rural Major Collectors and Urban Minor Arterials,
- Rural Minor Collectors and Urban Collectors, and
- Rural Local and Urban Local.

Roadways in Shutesbury are considered to be rural due to the density of the population. The functional classification has a hierarchy based on the level of service the roadway provides. Route 202 is classified as a Rural Minor Arterial. Lakeview, Locks Pond, the paved part of Wendell, Prescott, the paved part of Cooleyville and Leverett roads are classified as Rural Major Collectors. West Pelham Road is classified as a Rural Minor Collector. All other roads are classified as local roads.

Table 5-1: Road Mileage by Functional Classification and Maintenance Authority.		
Maintenance Responsibility	Functional Classification	Number of Miles
Mass Highway	Rural Minor Arterial	3.16 miles
Town of Shutesbury	Rural Major Collector	8.5 miles
Town of Shutesbury	Rural Minor Collector	2.79 miles
Town of Shutesbury	Rural Local	19.86 miles
Private Roads	Unaccepted	6.24 miles
MDC	Unaccepted	4.87 miles

Source: Mass Highway Planning, Year End Massachusetts Road Inventory File, 1999.

Table 5-1 shows the breakdown by functional classification and maintenance authority of the 45.42 miles of roadway in Shutesbury. Unaccepted roadways (11.11 miles) are those roads that are maintained by a private individual or organization. It can be seen from the table that the Town is responsible for the maintenance of 31.15 roadway miles, the majority of which are classified as Rural Local. Roadways with a functional classification of Rural Major Collector or higher are eligible for Federal Aid or Non-Federal Aid through the Transportation Improvement Program (TIP) for reconstruction projects.¹

¹ AASHTO, *A Policy on Geometric Design of Highways and Streets*, 1994.

Currently the town maintains these roads with three full-time crewmembers and uses part-time help for winter maintenance. The highway crew is also responsible for snow and ice removal for most of the private roads. Through capital planning the town has supported the town highway department by providing equipment and material. Over the last four years the town has purchased a new pickup truck, plow and ten-wheeler at a cost of \$134,000. The Town has also provided \$120,000 for gravel road upgrades. Although Shutesbury has provided capital funds for these items, decreases in state aid have resulted in three straight years of decreased operational budgets for the highway department. Table 5-2 provides the operating budget lines for the highway department for FY02, 03 and 04:

Table 5-2: Town of Shutesbury Highway Department Funding.			
	FY02	FY03	FY04
Highway Department:			
Highway Superintendent	37,584	39,840	40,637
Wages	57,180	61,961	63,101
Fuel	11,000	11,000	11,000
Expenses	2,500	2,250	2,250
Materials	23,000	20,000	20,000
Machinery Maintenance	23,000	20,000	20,000
Tools and Equipment	3,600	3,600	3,600
Uniform Service	1,675	1,675	1,675
Gravel Road Upgrade	40,000	25,872	0
Striping	6,900	8,000	8,400
Subtotal Highway Department	206,439	194,198	170,663
Snow Removal:			
Wages	12,600	12,600	12,600
Materials	40,000	40,000	40,000
Subtotal Snow Removal	52,600	52,600	52,600

Two of the last four years, the Town of Shutesbury received additional funding through the Massachusetts Emergency Management Agency due to severe winter storms. The severity of each winter is reflected in the tons of salt and sand used by the Highway Department. Table 5-3 shows the amounts of salt and sand used in each of the last four winters.

Table 5-3. Town of Shutesbury Annual Salt and Sand Use.		
Year	Salt in tons	Sand in tons
1999-2000	273.97	2,411
2000-2001	529.59	4,329
2001-2002	418.6	2,283
2002-2003	631.58	4,225

Pavement Management

A pavement management system (PMS) as defined by the American Public Works Association (APWA) is “a systematic method for routinely collecting, storing, and retrieving the kind of decision-making information needed (about pavement) to make maximum use of limited maintenance and construction dollars.” Historically, road maintenance funds were channeled to those roads that were perceived by local highway superintendents to be in the worst condition. Various studies have indicated that a pavement maintained in a perpetual “good” to “excellent” condition, requires one-fourth to one-fifth the investment of a pavement that is poorly maintained and rehabilitated only after it reaches a “poor” or “failed” condition. A PMS is designed to provide quantitative information to support repair and budget decisions to maintain roads in a perpetual “good” to “excellent” condition. The PMS is not intended to be a stand-alone management tool. It is intended to be a starting point that takes into consideration other factors such as available budget, localized drainage issues, superintendent priorities, etc. The Town of Shutesbury has a PMS that was developed by the town Roads Advisory Committee in 1995 and updated by the Franklin regional Council of Governments in 2003 (*see Appendix F*). The Shutesbury Roads Advisory Committee works closely with the Highway Superintendent in determining maintenance of both paved and gravel roads. This is used to allocate the limited dollars available for such projects. The Town only receives \$70,000 per year in state aid for roads.

Gravel Road Management

Of the 31.15 road miles maintained by the Shutesbury Highway Department, 15.7 miles (just over half) are gravel roads. Although the town spends only about \$30,000 per year in materials for these roads, they are very resource-intensive to maintain. As the population of Shutesbury grows, traffic volumes increase adding to the maintenance burden. The town has been grappling with the issue of maintaining the gravel roads versus paving them. Although the rule-of-thumb-threshold for upgrading a gravel road to a surfaced road is 500 cars per day, concerns about development pressures due to converting from gravel to paved, questions of increased traffic

speed, and uncertain impacts on the rural character of the surrounding neighborhoods have made these difficult decisions for the town.

Many Shutesbury residents have made a conscious decision to either avoid or live on a gravel road. Paving a gravel road impacts town character and development. Conversely, tough fiscal times and heavy traffic place undue burdens on the community, especially on Highway Department staff. Roadside erosion from runoff on steep hills is particularly noticeable when traveling over the town's gravel roads after a severe rainstorm. Impacts from weather and traffic clearly show how quickly a gravel road can deteriorate. However, the town has taken many interim measures to extend the life of the town's gravel roads by improving localized drainage problems, upgrading gravel quality, and using localized applications of geo-textile fabrics to strengthen the gravel road base. These measures have served to lengthen the time before a road becomes too costly, either in materials, labor, or equipment, to maintain as gravel. Gravel road issues will need to be addressed using maximum participation from the town in order to balance the many competing demands on town resources and to address concerns about the nature of Shutesbury.

Bridges

Bridges are critical components of roadway networks and predominantly come under the domain of MassHighway. Bridges are regularly inspected and rated according to standards established by the American Association of Highway and Transportation Officials (AASHTO). Bridges are determined to be "structurally deficient" if they fall below specific thresholds. Bridges are determined to be "functionally obsolete" when they are inadequate to fulfill the desired function. The Pratt Corner Road bridge was replaced by a box culvert in 2000 using state funds. The only other bridge in Shutesbury is co-owned with New Salem and is on the gravel portion of Cooleyville Road. This bridge is weight-limited and in need of repair.

Traffic Counts

The FRCOG and MassHighway have been collecting traffic volume data at various locations in the Town of Shutesbury since 1991. Each traffic count consists of data collected during a period of at least two consecutive weekdays. These traffic counts are then used to estimate an Average Weekday Traffic (AWT) volume. To reflect seasonal differences in traffic volumes, MassHighway produces seasonal adjustment factors based on data from the more than 200 statewide locations with permanent counters that collect traffic data every day of the year. The seasonal adjustment factors are then applied to the AWT volume estimates to produce Average Annual Daily Traffic (AADT) volume estimates for data collection sites. For example, August is a high travel month so seasonal adjustment factors for August would decrease an AADT volume estimate based on data collected in August. On the other hand, March is a low

travel month, so the seasonal adjustment factor would increase an AADT volume estimate based on March data. The AADT volumes are rounded to the nearest 100 for counts more than 1,000, and to the nearest 10 for counts less than 1,000.

Table 5-4 lists the Shutesbury locations where traffic count data has been collected since 1991 (these locations are also shown on the Transportation Map). It can be seen from Table 5-4 that there has been consistent growth on Lakeview Road. This may be caused by two factors: more people are using Lakeview Road as a collector from Wendell; and the Lake Wyola state park was open during the last count. There are no other consistent patterns of growth at the traffic count locations in Shutesbury, and no one location has seen a dramatic increase or decrease in its traffic levels. For some of these locations, conclusions can be drawn as to why the AADT has increased or decreased. For example, the Leverett Road traffic count site 0.3 miles from Pratt Corner Road had the same traffic volume of 2000 for 2000 and 2003, but the 2003 AADT is higher because the seasonal adjustment was different due to the date of counts.

Road	Location	1991	1993	1995	1996	1999	2000	2001	2002	2003
Baker Road	Between West Pelham & Pelham Hill Roads	200								
Cushman Road	200 ft. west of Cross Road								170	150
Cushman Road	Amherst town line								230	220
Lakeview Road	Between Locks Pond & Farrar	740			810		920			
Leverett Road	0.3 miles east of Pratt Corner	1380		1620		1680	1620			2000
Leverett Road	Between Pelham Hill and Wendell						1750			2000
Locks Pond Road	0.25 miles north of Old Orchard				570		620			
Montague Road	North of Leverett Road							450		370
Montague Road	South of Leverett Town Line	560	170		150			170	200	190
Pelham Hill Road	South of Baker	340			310		300		280	
Pelham Hill Road	North of Baker					340				
Pelham Hill Road	South of Leverett Road								400	
Prescott Road	West of Route 202			800			810			940
School House Rd	South of Baker	120								
Wendell Road	Wendell town line		800		670	740			730	
Wendell Road	North of Leverett Road	600		810		910	890			
West Pelham Rd	200 feet south of Leverett Road				840		810			
West Pelham Rd	0.75 miles south of Leverett Road	660			520		630			
West Pelham Rd	Pelham town line									760

Based on the above discussion, it is clear that caution must be used when trying to determine traffic growth rates on individual roadways. However, from the locations where there is a reasonable level of confidence in the accuracy of the AADT, it can be concluded that the major

roadways in Shutesbury have seen minimal growth in traffic volumes from 1991 to 2002. This reflects a pattern that has been seen across most of the region.

Accident Analysis

Individual traffic accidents are unpredictable. However, road conditions may be factors that determine whether accident probabilities will be high or low. Road conditions that increase the chances, or probabilities, of accidents are often correctable. The vast majority of traffic accidents are the result of driver error, but often driver error is magnified by poor roadway or intersection design, or by inadequate traffic control measures. When crashes occur in high numbers at a particular location, there is probably a common reason for the accidents that is related to the design and/or signage of the road at that spot.

All traffic accidents resulting in over \$1,000 of property damage or resulting in personal injury or death must be reported to the local or State police and the Massachusetts Registry of Motor Vehicles (RMV) within five days of the accident. The RMV records each of these accidents in a statewide database, which the FRCOG uses to conduct preliminary analysis of accident trends in Franklin County. In 2000, the FRCOG completed a study to identify the thirty most hazardous intersections in Franklin County based on RMV data from 1995 through 1997. No intersections in Shutesbury appeared on this top-thirty list. For the Shutesbury Master Plan, a review was conducted of RMV-recorded accidents in Shutesbury from 1999 through 2001, the three most recent years of available data.

In the three-year period of 1999 through 2001, fifty-three accidents were reported for Shutesbury; however six were on roads not in Shutesbury leaving a total of forty-seven. The following is a breakdown of those accidents:

- Just over 36 percent (17) of these accidents resulted in injury to at least one of the parties involved.
- 68 percent (32) of the accidents occurred under dry (clear or cloudy) weather conditions, 4 percent (2 accidents) occurred in wet (rain) conditions, and just under 17 percent (8 accidents) occurred in icy (snow or sleet) conditions.
- The majority (35 accidents) occurred between 7 AM and 7 PM, the peak travel period of the day.
- 17 percent (8 accidents) occurred during the fall foliage months of September, October and November.
- 34 percent (16) accidents occurred on gravel roads with 50 percent (8) of those occurring on Pratt Corner (the longest gravel road in Shutesbury).
- 26 percent (12 accidents) occurred at various locations along the 3.2 miles of Prescott/Cooleyville/Leverett roads, which extends from Route 202 to the Leverett town line.

A summary of the Shutesbury accident data by location is provided in Attachment 3 (*see Appendix F*). Based on these data there are no sections of road that seem to be more dangerous than others. Leverett Road and Pratt Corner Road need further review.

Prescott/Cooleyville/Leverett Safety Improvement Study Background

The segment of east/west roadway consisting of Leverett, Cooleyville, and Prescott Roads (the LCP), which runs through the Shutesbury Town Center, is the town's main roadway in those directions. Many homes are located along the LCP near Shutesbury Center, some very close to its travel lanes. Residents use the LCP locally and to access Route 202 to the east and the Amherst area to the west.

The LCP also serves non-local traffic connecting between Route 202 and the Amherst/University of Massachusetts areas. Although this use to some extent is unavoidable, large volumes of such traffic are to be discouraged through the heart of the town. Use of the LCP as a through-route necessitates a steep drop or climb to/from Route 202 and negotiation of the almost-as-steep, narrow, curving section of roadway at the Leverett town line known as the "S-curves." Given these two intractable obstacles to safe travel, particularly in winter, the LCP should not be considered by the town, the Franklin Region Council of Governments, or the State for any official recognition or improvement as an inter-town connector between Route 202 and the Amherst area.

The Town is in the process of applying for funds to reconstruct the LCP and its drainage infrastructure through the State's new Footprint Roads Pilot Program. After many years of controversy over the design of a reconstructed LCP, Town Meeting finally approved this program because it promises to confine the work largely to within the road's existing horizontal and vertical alignments.

Roadway Level of Service (LOS) Analysis

Level of Service

Traffic volumes provide an indication of the actual number of vehicles using a certain section of roadway. The Highway Capacity Manual 2000 provides a methodology for estimating mobility provided to motorists by a roadway under actual traffic conditions. This methodology provides two types of Level of Service (LOS) analysis; Class I and Class II, depending on the type and function of roadway being analyzed. Class I designation applies to "arterial" roadways, roads that primarily accommodate long distance trips and where drivers have an expectation to travel at relatively high speeds (such as Route 202). The methodology compares a set of ideal roadway

geometrics (such as lane and shoulder widths, amount of available passing and mix of vehicle types) to the actual conditions and peak-hour traffic volumes measured along a roadway segment. The LOS for Class I roadways is assigned based on the estimated average speed and the percent of time spent following another vehicle. Class II analysis applies to lower classified roadways, that serve relatively short trips, the beginning and ending portions of longer trips, or trips for which sightseeing plays a significant role. This methodology compares peak-hour traffic volumes to the passing opportunities, and LOS is assigned based on the calculated percent of time spent following another vehicle.

There are six LOS definitions, assigned letters A through F, where A represents the best operating conditions and F the worst. In general, it is desirable to maintain traffic conditions at a LOS D or better. All roadways in Shutesbury, with the possible exception of Route 202 come under the Class II definition. As part of the Footprint Road Program Application for the Leverett/Cooleyville/Prescott Roads reconstruction, an LOS analysis was conducted. Leverett Road was assigned a LOS B rating and Cooleyville/Prescott Roads assigned a LOS A rating.

Alternative Transportation Facilities

Pedestrian Facilities

The rural and small town nature of Shutesbury makes providing a comprehensive pedestrian network difficult. Shutesbury currently has only one sidewalk, which is located along the elementary school driveway stretching from the school to West Pelham Road (approximately 400 feet). In many locations the rural roads are narrow. Near Shutesbury center the narrow roads are coupled with houses being built very close to the road. In some circumstances structures are either in or very near the road right of way. The Town of Shutesbury does not have a commercial store or shopping center. There are some heavy pedestrian traffic areas in the town center, however the roads do have wider gravel shoulders to allow for pedestrian traffic near the post office and town hall.

Transit Service

While Shutesbury is in Franklin County, most of its citizens work in the Amherst area. A recent study was completed to determine if transit service into Shutesbury from Amherst was affordable. A survey was sent to all residents in the Town as a part of the newsletter in the fall of 2001. The survey showed that some people were interested in limited use of service to Amherst, but only sixteen respondents said that they would use it five or more times per week. Given such limited demand, the town could not justify the costs of the service at this time.

The G-Link, operated by the Franklin Regional Transit Authority (FRTA) and the Montachusett Regional Transit Authority (MART) traverses Route 2 between Greenfield and Athol. This service links with routes to Gardner and Winchendon, and onto Boston via bus or commuter rail from Fitchburg. This service is seldom used because of the half-hour drive to access it. There is also direct bus service from Amherst to Boston. The Vermonter, an Amtrak passenger service, which runs from Vermont to Washington D.C., also stops in Amherst. The bus and rail passenger service from Amherst seems to be the most convenient for people living in Shutesbury.

Bikeway Facilities

Shutesbury presently accommodates bicyclists nicely. The roads are very scenic and have light levels of motor vehicle traffic. A feature of many Shutesbury Roads noted by everyone who has ever bicycled here is the topography. On Leverett/Cooleyville/Prescott Roads the elevation rises approximately 500 feet in the mile between Route 202 and Shutesbury Center, then drops again heading west toward the Leverett town line. Although this steep terrain makes the road unattractive for novice, casual, or inexperienced bicyclists, it provides a challenge to more experienced riders. Other paved and gravel roads in Shutesbury are scenic and less steep making them conducive to more casual riding. The greatest concern for most bicyclists and pedestrians is traffic speed. There are some trails that provide bicycling opportunities scattered throughout the town. Although it is not in Shutesbury, the Franklin County Bikeway provides bicycling opportunities for many Franklin County residents. The bikeway, still under construction, utilizes shared roadways and provides a link to the Northfield Mountain Recreation Center. A grant application to investigate the feasibility of formally extending the bikeway into Shutesbury through signage was not funded.

Recommendations

- Investigate and implement ways to improve pedestrian safety crossing Cooleyville, Leverett and the south side of Wendell roads. Investigate measures or devices to slow vehicle speeds through Town center and along the Prescott/Cooleyville/Leverett roads.
- Investigate using the existing paved and gravel roads as a link for pedestrian and bicycle traffic between Shutesbury Town Center and the Franklin County Bikeway.
- Investigate ways to connect trails that have hiking and bicycling opportunities.
- Maintain a PMS program to help maintain paved roads.
- Develop a Gravel Road Maintenance System.

- Continue support for the G-Link transit service and continue to investigate expanding service to Shutesbury.
- Continue to monitor the shared bridge and seek funding to maintain it. Explore an appropriate means of repair or replacement.
- Encourage the adoption of best management practices in all town departments, especially for the use of road sand and salt by the Highway Department.
- Identify the level of road maintenance sought by Shutesbury residents and ensure that any roadway upgrades balance safety considerations with neighboring rural character and town-wide network needs.
- Identify and address the long-term needs of the Highway Department including facilities, equipment and space.
- Identify and implement means to encourage drivers to obey the speed limits posted along all Shutesbury roads.
- Address the issue of paved versus gravel from all aspects including cost analysis, labor, quality of life, town character and traffic load through a means that provides maximum participation of the citizens of Shutesbury. Investigate new methods of gravel road maintenance to determine if there are any better methods.

CHAPTER 6

HISTORICAL AND SCENIC RESOURCES

Shutesbury's historical resources are "heirlooms" entrusted to current day care by preceding generations. Many of Shutesbury's natural scenic features are the result of historic human events and activities. Together these irreplaceable historical and natural features provide a scenic backdrop that enhances the quality of everyday life in Shutesbury. The purpose of this chapter is to promote an appreciation of the wealth of Shutesbury's historical and scenic resources, which will ensure their continued protection.

What follows is a limited summary of Shutesbury's vast historical and scenic resources to give the reader a flavor of close to 300 years of documented history, preceded by thousands of undocumented years, and of countless hours of scenic hiking and exploring. A comprehensive written history that would similarly document Shutesbury's recent history to follow Louis Everet's 1879 treatment of Shutesbury's early history in the History of the Connecticut Valley in Massachusetts is one important recommendation noted in this chapter.

Subsequent to the July 1998 start of the development of a Master Plan for the Town of Shutesbury, the Historical Commission has been actively involved in the identification and protection of historical resources. Two major projects that spawned subsequent preservation activities are:

1. *The Community Documentation Plan*. This plan was drafted during winter 2000/2001 by William F. Carroll, CA, consulting archivist for the Massachusetts Historic Resources Advisory Board (MHRAB) Community Heritage Grant, with the cooperation of municipal officials and representatives, participating non-profit organizations, and with the collaboration and assistance of the Records Review Grant Committee members. Shutesbury resident Carrie Stone directed the effort. The project mission was to ensure the collection and preservation of records and materials that document all aspects of daily life in the Town of Shutesbury, to provide access to such records and materials, and to raise awareness of and appreciation for the heritage of the Town of Shutesbury.
2. The *Shutesbury Historic Resources Survey* prepared in 2001-2002, by Margaret Hepler. Margaret reviewed the existing Massachusetts Historical Commission forms, updated the Shutesbury Historical Commission inventory, and created a complete and accurate inventory of the town's most important architecture, cultural landscapes, structures, and other visible aboveground historical features.

The Final Report of the Shutesbury Historic Resources Survey 2001-2002, written by Margaret Hepler lists fourteen individual properties and two area properties as potential candidates for the National Register of Historic Places. The Historical Commission will advise and support property owners who want to have such designation placed on their properties. The Commission will explore securing registration for appropriate historical

town owned properties including the Town Common, with the listed historical resource preservation partners.

This chapter was prepared under the guidance of the Shutesbury Historical Commission, the Master Plan Committee, the Town Administrator and the Franklin Regional Council of Governments (FRCOG) Planning Department. Other resources include:

- Archaeological resources information, provided by Massachusetts Department of Conservation and Recreation (DCR) Archaeologist Thomas Mahlstedt, was revised and adapted for the Shutesbury Master Plan by DCR Planner and Shutesbury resident Leslie Luchonok, and the revision reviewed by Professor Emerita of Anthropology at the University of Massachusetts at Amherst, Dina Dincauze.
- Surveys conducted in preparation for writing this chapter include:
 1. The 2000-2001 Master Plan Survey completed by the residents and property owners of Shutesbury.
 2. The June 2001 *Community Documentation Plan* written by William Carroll, Certified Archivist.
 3. The August 2002 *Shutesbury Historic Resources Survey*, completed by independent preservation consultant Margaret Hepler.
- A 2002 graduate student project undertaken by Alex Ganiaris and Andrea Morris of the Conway School of Landscape Design entitled the Town Center Plan was commissioned by the Master Plan Committee to provide various perspectives on the preservation of Shutesbury's historic town center.
- The Goal and Objectives of this chapter, based on the 2000-2001 Master Plan survey, were compiled by William Labich, FRCOG Land Use Program Manager and approved by the Shutesbury Master Plan Committee.

Goal and Objectives

Goal:

- Identify and protect historical and scenic resources including buildings, sites, and landscapes.

Objectives:

- Review the existing **Massachusetts Historical Commission forms** and the updated Shutesbury Historic Commission inventory to determine if any actions are still needed to create a complete and accurate inventory of all historical buildings, sites, foundation holes, important stonewalls, and landscapes.

In 2001-2002, the *Shutesbury Historic Resources Survey* surveyed eighty-six individual property forms and four area forms. These include 125 buildings, seven cemetery-associated resources and twenty-nine structures, landscapes and objects.

The town's many mill sites, stone chambers of undetermined origin, hearthstones of "Hearthstone Hill" and other archaeological sites may be subjects for a future survey. This will be balanced with the risks of vandalism imposed on irreplaceable archaeological resources after their publication. A guiding principle of the Shutesbury Historical Commission is that historical treasures are "heirlooms" entrusted to our care by the generations preceding us. Shutesbury has treasures few other towns have the opportunity to preserve, and is dedicated to their protection.

- Consider adopting steps such as implementing a **demolition delay by-law** to support the protection of significant historical structures in Town.

The Shutesbury Historical Commission uses the guiding principal of not imposing on private property owners but believes that the Commission should advise and support property owners who want to act on their own. The Commission will collaborate with the municipal groups listed in the resources section, to develop a position on a demolition delay by-law for town-owned property.

- Identify and pursue **federal and state grants** in support of historical resource protection especially for the old Town Hall.

The Shutesbury Historical Commission is unanimous in its position that the objectives of the Master Plan should be met with local resources and not with state or federal grants—which can introduce outside requirements or control. The founding mission of the Friends of the Historical Commission is to support the preservation of the Old Town Hall.

- **Identify, document, and protect significant historical and scenic landscapes** especially remaining agricultural and community development landscapes.

This will be balanced with the risks of vandalism imposed on irreplaceable archaeological resources once locations have been published. A guiding principal of the Shutesbury Historical Commission is that Shutesbury's historical treasures are "heirlooms" entrusted to our care by the generations preceding us. Shutesbury has treasures few other towns have the opportunity to preserve, and the Historical Commission is dedicated to their protection.

- Develop a **policy for use of the Town Common, Spear Memorial Library, and the Old Town Hall**, which respects the traditional uses of these buildings while at the same time, providing access for all town residents to these popular community resources.

The Conway School of Landscape Design study presents multiple preservation possibilities. The Shutesbury Historical Commission will collaborate with the previously listed, town historical resource preservation partners in development of such policy.

- Adopt **local scenic road designation** for Shutesbury’s most scenic roads.

The Historical Commission will work with the Planning Board and other historical resource preservation partners regarding scenic roads, including the protection of trees and stonewalls.

- Explore the feasibility of National Historic designation for the Shutesbury Town Common.

Historical and Natural Scenic Features of Shutesbury

Shutesbury is a small, hill town situated in southeastern Franklin County along the high drainage divide between the Connecticut and Swift River basins. Most of the town is above 1,000 feet in elevation, with the town center at 1,225 feet above sea level. The highest elevation is 1,305 feet at “Meetinghouse Hill,” so-called in the July 1756 Proprietors meeting record, two miles north of the town center. The lowest elevation is around 400 feet, near Pratts Corner in the southwestern part of the town. The town contains twenty-six square miles of territory.¹

The Shutesbury Town Common, lying on the crown of the ridge, is a largely open space from which views could once be had on clear days as far west as Mt. Greylock, as far east as Mt. Wachusett, and as far north as Mt. Haystack. Early twentieth century photographs show how dramatic those views were before a number of surrounding view-blocking plantings and woods grew in height and breadth.²

In the northwest corner of Shutesbury, Lake Wyola, a 125-acre dammed pond is the center of a thriving summer cottage community that is increasingly a year-round residential village. In the eighteenth and nineteenth centuries it was a millpond called Lock's Pond that supplied a series of mills on the outflow stream, Sawmill River, which flows into Leverett one quarter mile west of the lake.³ The current dam, built in 1888, commands a 125-acre body of water and offers a scenic gateway to Lake Wyola for travelers from the west. A view, not soon to be forgotten, is that of the full moon rising over the lake as seen from that town-owned dam.

On a hilltop in northeast Shutesbury, about one mile east of Lake Wyola, stone features from the nineteenth century-Mt. Mineral Springs Hotel today form part of the landscape of Temenos, an active center for meditation and retreat. The site, in a remote forest-covered part of Shutesbury, is accessed via an unpaved road (Horse Hill Road) which winds uphill from Mt. Mineral Road through ledge studded slopes to a small level clearing near the top of the hill. Here a small pond, cottages, and stonework from the era of the resort surround small

¹ Louis H. Everts, *History of the Connecticut Valley in Massachusetts*, Vol. II (1879) p. 757.

² Margaret Hepler, “Final Report of the Shutesbury Historic Resources Survey” 2001-2002.

³ *Ibid.*

mineral spring pools. A large weathered ledge displays graffiti also from nineteenth century activity.⁴

Other stone features associated with the site include a three-foot high by two and a half-foot wide exposed stone with an enigmatic carving of a figure in a bell-shaped frame, on top of Mt. Mineral, and an underground stone chamber at the mountain base. These suggest an earlier, undocumented history for the site.

A primitive woodland trail from the Temenos cabin complex leads the hiker to a west-facing ledge out-cropping. From that out-cropping, one has a clear-day background view of Mount Greylock above a close-up panorama of the Ames pond and bog. The Department of Conservation and Recreation (DCR) holds a Conservation Restriction on a 140-acre area that includes the Ames pond, bog and surrounding land, site of the late 19th and early 20th century Ames Sawmill.

In the southern end of Shutesbury, Baker Reservoir, dammed in the 1890s, is a pond covering about four acres surrounded by marshland and woods. Currently ungated, the dam opening releases pond water into a culvert under the road, which then flows into a small brook on the north side of Baker Rd. The small brook becomes one of the tributaries of Baker Brook, which flows under West Pelham Rd to the site of the former Baker sawmill. Albert Baker, of 7 Baker Rd, was a member of the third and last Baker generation to run the sawmill located West of West Pelham Rd,⁵ buying the sawmill at the public auction of his father's John J. Baker's estate in 1878, and selling it to Henry Adams of Amherst in 1905. As viewed from Baker Rd, the Baker Reservoir transitions into a swamp at its south end with much wetland vegetation growing in the water.

Just east of Baker Reservoir, on land owned by the Sirius Community, a series of hearthstone shaped stone structures are scattered across a hillside. Future research may link them to an early 19th century survey referencing "Hearthstone Hill." Currently lost amidst a forest, it is thought that these structures may once have graced an open west-facing slope.

Atkins Reservoir, in the southwest corner of Shutesbury replaces the Amherst Water Company's 1900 Atkins Pond source of water for North Amherst. A 1930 Tighe and Bond survey prepared for the Amherst Water Company and housed in the Shutesbury Assessors' oversized "black book" identifies private lands taken to create the larger reservoir. At full capacity, the 64-acre reservoir contains 295,000,000 gallons of water. At low capacity, the pre-1930 location of Cushman Road with flanking stonewalls is visible along the southeast side of the reservoir. At high and low capacity, today Atkins Reservoir provides a scenic view of water, shores and waterfowl for travelers of both January Hills and Cushman Roads.

The state-owned Quabbin watershed dominates Shutesbury's eastern border. On April 28, 1938 at 12:01 AM, the four towns of Dana, Enfield, Greenwich and Prescott were unincorporated to create the Quabbin Reservoir. A large portion of Shutesbury's most fertile farmland in the valley of the West Branch of the Swift River was sacrificed for Boston's

⁴ Margaret Hepler, "Final Report of the Shutesbury Historic Resources Survey" 2001-2002.

⁵ Ibid.

historic watershed. Currently valued for scenic hiking down historical woodland roads the watershed area was once the home of many prominent town officials including Benjamin Winter, Selectman for eight years and Representative to the General Court, George A. Berry, Selectman for five years and Town Clerk for two years, Harrison Hamilton, Town Clerk and Selectman for three years, H.C. Winter, Selectman for four years and Jesse and Jonas Winter, each with Select Board terms. The stone walls and foundations, the giant sugar maples and crippled old fruit trees, and the still flowering lilies and lilacs, suggest the relative prosperity of the specific property owners listed on the 1871 Beers Atlas (Appendix G -I) to present day hikers.

The 2000-2005 Open Space and Recreation Plan contains a complete Inventory of Shutesbury's "Scenic Resources and Unique Environments." (Appendix G-II)

Archaeological Resources

State of Knowledge

In reviewing the archaeological data of the Quabbin Watershed, within which a portion of Shutesbury lies, one is impressed first with the number of prehistoric sites, and secondly with the poor quality of the data concerning the formation processes. Unfortunately most of the sites in the former Swift River Valley and along its tributaries have been disturbed in one way or another, so there is little substantive information regarding prehistoric occupation in the area.

Analysis of artifacts from prehistoric sites in the greater Quabbin area reveals a pattern of multiple, recurrent occupation. Few sites have yielded artifacts from a single cultural/temporal period. Instead, artifacts from several periods have typically been recovered from sites. This suggests that some particularly well-sited locations were occupied, or otherwise utilized, more than once. Recurrent, though intermittent, occupation of a single site, sometimes over a period of several thousand years, appears to have been the prevalent pattern of prehistoric site development in this region.

Small groups, probably based on kinship, would have found the uplands most attractive for short-term occupation. Settlement is likely to have occurred on virtually any elevated, level and well drained surface that was located immediately adjacent to sources of fresh water, including the headwaters of ephemeral streams, springs, and small wetlands and ponds. Rock shelters and other natural overhangs, and locations with southerly exposures would also have been utilized.

Archaeological resources are fragile and non-renewable. Once destroyed they are gone forever; they cannot be re-grown, rebuilt, repaired or otherwise brought back to health like many of our natural systems. Similar to endangered and threatened species of flora and fauna, the fragility of these resources places a value on them that is difficult to calculate.

Currently, the Massachusetts Historical Commission (MHC) has records for over seventy prehistoric sites on the state-owned Quabbin Watershed Reservation. Although Quabbin Watershed Reservation includes only a small portion of the town Shutesbury, it nevertheless

provides meaningful context and suggests the archaeological potential for this area. While informative, this figure is artificially low. Although the MHC's records are the single most complete archaeological data bank in the state, they represent but a small fraction of the actual number of sites that are known to vocational archaeologists and collectors.

Prehistoric Overview

Existing archaeological evidence derived from MHC records of the Quabbin Watershed Reservation suggests that Paleo-Indian hunters and gatherers, the first human inhabitants of the New World, reached the Swift River drainage sometime between 9,500 to 12,000 years ago. Approximately 9,500 years ago climatic warming responsible for melting the last glacier created an environment in southern New England that supported a mixed pine-hardwood forest. Archaeological sites further indicate that human occupation of the area continued during the *Early Archaic period* (ca. 9,500 to 8,000 years ago).

During the *Middle Archaic period* (ca. 8,000 to 6,000 years ago) climatic and biotic changes continued and the mixed deciduous forests of southern New England were becoming established. Significantly, the present migratory patterns of many fish and birds are believed to have become established at this time (Dincauze; 1974). During spring, those rivers, streams and ponds, which were utilized by anadromous fish for spawning would have been particularly important for fishing, and the former Swift River, and its East and West Branches seemed to have played a major role in this important subsistence activity. Small groups, comprised primarily of extended families, are likely to have traveled considerable distances to camp adjacent to falls and rapids where they could easily trap and spear the salmon, herring, shad and alewives that were on their spawning runs. This subsistence strategy persisted throughout prehistory. Archaeological sites indicate evidence of Native American occupation of the Quabbin region during this *Middle Archaic period*.

Many sites within the Quabbin Watershed have yielded diagnostic *Late Archaic period* (ca. 6,000 to 3,000 years ago) materials. The marked increase in site frequencies and densities is consistent with findings throughout most of southern New England, and may document a population increase during this period. Each of the three traditions - the Laurentian, Susquehanna and Small Stemmed Traditions - is well represented in the archaeological record of local sites. Terminal Archaic activity (ca. 3,000 - 2,500 years ago) is also suggested at archaeological sites.

During the *Early, Middle and Late Woodland* periods (3,000 - 450 years ago) Native Americans continued to occupy the Swift River drainage. Regionally, horticulture was introduced during the Late Woodland and small gardens may have been planted in clearings located on the fertile alluvial terraces next to the Swift River and its larger tributaries.

Native American Settlement at the Beginning of the Colonial Period

According to The Major Tribes of New England ca.1635 map (Appendix G IIIa), at the time of colonial settlement, the Pocumtucks and Nipmucs inhabited the area of Shutesbury.⁴ According to Shutesbury – Historical Notes (from the Booklet published September 6, 1937), “Perhaps the earliest record of Shutesbury lands is in an Indian deed. This conveyance ‘unto Major Jon Pynchon of Springfield’ was dated December 5, 1658 and signed by ‘Umpanchla alias Womscom,’ ‘Quonquont alias Wompshaw,’ and ‘Chickwolopp alias Wowahillow —ye sachems of Nolwotogg.’ It included parts of the present towns of Shutesbury, Amherst, Belchertown, Pelham and Hadley ‘being neare about nine miles in length from ye south part to ye North part, And all within ye Compass from Quenecticot River Eastward Nine miles out into ye Woods’.”

Historical Sites

In addition to prehistoric archaeological sites, Quabbin watershed contains a wealth of historic archaeological sites. Since 1736, colonists have been drawn to the Swift River Valley by its water resources for manufacturing purposes and the valley's rich alluvial soils.

By 1822, Prescott, Enfield, Dana and Greenwich had a combined population of 3,000 people and they were incorporated as towns. Over the ensuing century, these communities prospered but retained their small size and rural characteristics.

The Swift River Act of 1927 appropriated funding to build the Reservoir. The lands within the four Swift River communities were appraised and purchased by the Commonwealth as plans for the Quabbin Reservoir were finalized. With additional land from adjacent towns, the state acquired a total of 80,433 acres by 1938. During this time, 650 houses and 450 structures were removed from the valley. Many of the superstructures of these buildings were relocated to other communities, and some had their cellar holes filled, leaving little or no trace of their existence. The filling was especially prevalent in Prescott. However, the foundations from farmsteads and mills in the other communities were often left intact. Also scattered across the landscape is a maze of stone walls, farm roads, wells and other cisterns, and refuse piles that further document the historical land use of the Swift Valley. A historical site inventory performed by the former Metropolitan District Commission from 1994 to 1998 identified thirty-one historical archaeological sites just in the portion of Shutesbury that lies within the Quabbin Watershed Reservation. These remnants of the Swift River Valley’s historical past represent a valuable cultural resource.

Due to popular interest in archaeological sites in other parts of Shutesbury, in 1979 the University of Massachusetts-Amherst Archaeological Field School systematically explored Shutesbury’s major above ground and underground sites, to answer the basic question, “How could the structures and other material remains illuminate understanding of past life in New England, historical or prehistoric?” The conclusion, written by University of Northern Iowa’s

⁴ Vaughan, Alden T. New England Frontier: Puritans and Indians 1620 – 1675. W.W. Norton & Company, N.Y. 1979.

John R. Cole and published in the fall 1982 issue of *Man In The Northeast* was that “No evidence was found to suggest that structures preceded historical settlement.”

Early Settlement In Shutesbury

In about the year 1733, ninety-five persons, a majority of whom resided in Lancaster, constructed a road, wide enough for a cart to pass, from that town to the Connecticut River, and upon the plea that their private enterprise, effected at considerable cost, had resulted in great public benefit in shortening the distance from certain towns in Hampshire County to Boston, they joined in a petition to the General Court asking for an appropriation of lands to recompense them for their outlay. On December 11, 1734, the House of Representatives ordered "that the petition be granted and the petitioners allowed and empowered by a surveyor and chainman, on oath, to survey and lay out a tract of the unappropriated lands of this province of the contents of six miles square"⁶ (Appendix G IIIb). The tract of land was named Roadtown.

On May 8, 1781, a large northern tract of Roadtown was annexed and joined with a portion of Ervingshire to become the new town of Wendell (Appendix G IV). A smaller eastern tract of land was broken off on February 20, 1824 to become a part of New Salem (Appendix G V). Additional historical maps were surveyed in 1795 (Appendix G VI) and again in 1830 (Appendix G VII).

On May 13, 1735, the Proprietors of "Roadtown" held their first meeting in Lancaster. A committee was appointed to lay out the tract in lots to be apportioned to the proprietors, no one whom, however, was to draw his lot until he had paid into the common treasury five pounds ten shillings for past and future charges (Appendix G VIII).

In the assignment of lots, a tract of 500 acres lying south of the road from Lancaster to Sunderland was reserved for use of the then Governor, Andrew Belcher. This tract was known as "the governor's farm," and out of it the governor deeded four acres adjoining the road to the inhabitants of Roadtown "for the building of the meeting-house and schoolhouse, and for a burying-place and training-field, forever."⁷ This is the former site of the Shutesbury Centre School and the site of the current Town Hall.

Many mills and small manufacturing establishments were located on various streams including:

- The first sawmill built soon after 1737 on Roaring Brook.
- The first corn mill built on what is now Atherton Brook, by Benjamin Harris about 1745, a millstone from which, discovered during the construction of the Quabbin Reservoir, was dedicated as part of the Town Common World War Memorial on May 31, 1937.
- Another gristmill was built about 1754 at Locks Pond.

⁶ Louis Everts, History of the Connecticut Valley in Massachusetts, Vol. .II (1879) p. 757.

⁷ Roadtown Proprietors Records 1735 – 1763.

In 1855, there were about fifteen sawmills in operation. There were numerous boot and shoe shops, Crossman's rake shop and Haskins' gold pen shop were all in operation at one time. The Adams-Fitts sawmill at Pratt Corner operated continuously for over 150 years and was the last water-powered mill to cease operation, a casualty of the development of Atkins Reservoir. Remnants of these endeavors remain to be enjoyed by the casual hiker. Some have been documented with photos and measurements.

A 1931 microfilm inventory from the "Corbin Collection," housed at the Special Collections room at the Jones Library in Amherst, lists the following Shutesbury cemeteries:

1. The Old Cemetery
2. The West Cemetery or Town Cemetery
3. Stetson Burying Ground
4. Pratt Corner burying ground (no entries)
5. Hamilton burying ground
6. Lock's Pond cemetery

The handwritten information includes helpful historical information as well as epitaphs such as the following from the grave of Lydia Clark, wife of Capt. Nathaniel Clark, who died January 15th, 1816 in the 74th year of her age:

*"The sweet remembrance of the Just
Shall flourish when they sleep in dust."*

The epitaph of Chs. W. Williams, killed by the "wreckless" carelessness of his FELLOW SOLDIER while engaged in a show fight on parade, was killed Sept. 16, 1845 Æ 22:

*A lovely youth beloved by all
By old and young, by great and small.
By rich and poor, by high and low
By everyone that did him know.*

Due to copyright concerns, the Jones Library cannot allow the entire record of town cemeteries to be printed from the microfilm for local use in Shutesbury.

Cemetery Commissioner from 1952 to 1985, Oscar Norell wrote the following chronology of town cemeteries for the February 1, 1986 *Roadtown Grapevine* {with additional factual information in brackets]:

"The first burial ground, the Center Cemetery, was established shortly after the town was settled and was located where the Town Hall now stands. It was a part of the four acres which was known as "the Governor's Farm," deeded to the town by the Governor. This was used until the late 1700s.

In 1796, the town purchased one acre of land to be known as the West Cemetery. Other parcels were added on in 1858, 1895, and two in 1954.

[In accordance with the an act of the Legislature of 1937, which was accepted by a vote of the Town Feb. 7, 1938, graves of about twenty persons buried in the old Centre Cemetery were opened and remains transferred to that portion of the cemetery reserved for a burial ground.] In 1949, the remains from the Centre Cemetery were moved to the West Cemetery in order to make room for consecutive new school buildings. Most of these remains and monuments are located on the east end of West Cemetery near Leverett Road. The oldest known grave marker is that of Aholiab Wilder, 1759. [The Aholiab Wilder marker was evidently broken off at some point. The top is housed in the Town Hall with Historical Commission records, with the approval of descendants' of Aholiab.]

In 1858, the town bought a small piece of land, 12 by 20 feet in area, on which to build a hearse house. The hearse house is still standing [on the roadside at the north end of the cemetery]. On the north side of Leverett Road, directly across from the cemetery is the West Cemetery tomb bought from William Crossman for \$50 in 1880. The Luther Henry Tomb Yard was a private cemetery acquired by the town in 1954.

Other cemeteries in town are the Pratt Corner Cemetery, located in the Southwest corner of town, which was purchased from Mr. Wheelock in 1823 and the Locks Village Cemetery located near the north end of Locks Pond Road on the west side and purchased in 1808.

The first meetinghouse was built about 1740, just south of the current Town Common approximately where Cooleyville Road runs today, and a church organized on October 5, 1742. The present church building on the Town Common was dedicated January 1, 1828; the first Congregational church (now privately owned) was built in 1836; the Methodist church at Locks Village was built in 1851; and a “new” Congregational church, built in 1884 to sit northwest of the church currently gracing the Town Common, burned on May 19, 1911 when it was struck by lightning.⁸

The historical nature of the Town Common invites tranquility and contemplation to those who stop by. It is a welcoming site to weary commuters returning home at the end of the day. It provides an open area, accessible to the public, for stargazing and offers the lingering essence of pink and purple sunrises (still felt, but mostly obliterated with neighboring trees) to the observant commuter heading off to another busy day. Its fragile future was well documented in the Town Center Study undertaken by the Conway School of Landscape Design in 2002.

Municipal Records

Unique primary source records document the people of Shutesbury and the municipal history from 1735 to the present, and have permanent and enduring value to the local and regional history and genealogy. Of particular interest are records of earmarks from the 18th century, and records of municipal actions during the Civil War.

⁸ Shutesbury 1761 – 1961: Commemorating the 200th Anniversary of the Settlement of the Town, 1961.

Municipal records in Shutesbury are stored in several locations. Most active administrative records are stored in the Town Hall office or storage areas. The Town Hall, built as a school in 1950, was gradually converted to municipal office space in the 1970s.

Most inactive municipal government records from the 1735 Roadtown Proprietors records to recent records are stored in the vault and storage areas in the Old Town Hall along with some 500 linear feet of historical publications and artifacts of the town's historical heritage. The Old Town Hall was built in 1829. It is Shutesbury's oldest municipal building.

Textbooks from the 19th and early 20th centuries, along with assorted artifacts and other documents, are stored in the old West Schoolhouse. Fire Department records and Highway department records are stored in their separate buildings.

Environmental, security, and space utilization needs for the various buildings in which records are stored are treated separately in the Long Range Historical Records Strategy Plan developed by William Carroll, Certified Archivist.

A companion plan to the Long Range Historical Records Strategy Plan, entitled the Community Documentation Plan, also developed by William Carroll is a practical guide for a town to follow to ensure that important historical records of daily life in the community are preserved and cataloged for the use of present and future generations. Its mission is "To ensure the collection and preservation of records and materials, which document all aspects of daily life in the Town of Shutesbury, Massachusetts; to provide access to such records and materials; to raise awareness of and appreciation for the heritage of the Town of Shutesbury." The long-term goals include "development of a framework within which the documentation of Shutesbury's historical heritage will be preserved and made accessible, and an increase in public awareness of and appreciation for Shutesbury's unique history."

Historical Preservation Resource Groups

Board of Library Trustees, established in 1936.

Friends of the Shutesbury Historical Commission, Inc. established in 2000 by members of the Historical Commission and the Old Town Hall Sub-Committee of the Town Buildings Committee, with a founding mission of preserving the 1829 Town Hall.

Friends of the Spear Memorial Library, Inc. established in 1997.

Lake Wyola Advisory Committee, established in 1990.

Town Buildings Committee, created by the 1988 Annual Town Meeting.

Old Town Hall Sub-Committee, established in 1999.

Shutesbury Board of Selectmen, established in 1761.

Shutesbury Cemetery Commission, established in 1912.

Shutesbury Historical Commission, created by the 1974 Annual Town Meeting.

Shutesbury Memorial Day Committee, establishment date unknown.

Shutesbury Recreation and Open Space Committee, established by combination of the pre-existing Recreation Committee and the Open Space Committee in 2002.

Shutesbury Planning Board, established in 1964.

Shutesbury Town Center Committee, established in July 2002.

Shutesbury Town Clerk, first clerk elected in 1761 upon the incorporation of the Town of Shutesbury.

The above listed local historical preservation resources can be reached c/o Town of Shutesbury P.O. Box 276, Shutesbury, MA 01072.

Private organizations in Shutesbury considered as historical and scenic resources preservation partners include: the **Lake Wyola Association, Morse Hill Recreation Center, the Shutesbury Community Church, the Sirius Community, and Temenos.**

In addition to local Shutesbury resources, members of the Shutesbury Historical Commission consider planning, open space, recreation and historical preservation organizations of such neighboring towns as Amherst, Greenfield, Hadley, Leverett, Montague, Pelham, New Salem (including the Swift River Valley Historical Commission) Wendell and other local communities, to be potentially important partners in historical preservation efforts.

In collaboration with local historical resource preservation partners, the Shutesbury Historical Commission welcomes and considers all suggestions for preservation activities that will honor the unique historical, scenic and rural character of Shutesbury that residents and property owners made special effort to identify as high priorities in the 2001 Master Plan survey. The guiding principle of the Historical Commission is that Shutesbury's historical treasures are "heirlooms" entrusted to current day care by preceding generations.

Recommendations

The Shutesbury Historical Commission, in collaboration with the listed historical preservation partners will continue to identify and protect historical and scenic resources including buildings, sites, and landscapes through:

- Review and follow-up on the documentation and preservation goals presented in the 2000/2001 William Carroll *Community Documentation Plan* and the companion *Long-Range Historical Records Strategic Plan*.

- Review and follow-up on the recommendations of the August 2002 *Shutesbury Historic Resources Survey* by independent preservation consultant Margaret Hepler.
- Collaboration with local and neighboring preservation groups as listed.
- Seek permanent town ownership of the Old Town Hall, the West Schoolhouse, the Town Hall, and the Spear Memorial Building.
- Promotion of a historic curatorship of the Lodge at Lake Wyola. Ensure preservation of the associated barn by the Department of Conservation and Recreation.
- Compilation of Shutesbury's late 19th and complete 20th century history into a book.
- Collection and preservation of Shutesbury's historic artifacts and documents.
- Collection and preservation of oral interviews.
- Purchase of Franklin County reel #36 of the Corbin Collection that contains a 1931 inventory of cemeteries of Shutesbury.
- Continue to offer public education and activities that promote long-term appreciation and protection of Shutesbury's historical resources.

CHAPTER

7

LAND USE AND ZONING

As a hill town in Eastern Franklin County, Shutesbury's historically rural development patterns have been strongly tied to its topography. With elevations over 1,000 feet, Shutesbury's cooler climate and poorer soil conditions did not support intensive agriculture, which provided communities within the Connecticut River floodplain a foundation for larger populations. From the late 1700s through the 1800s, Shutesbury's upland terrain provided conditions suitable for mills and wood production. Streams, brooks, and ponds, carrying water that flowed off the highland divide between the Connecticut and Swift River basins provided power for sawmills and corn mills. The town's forests helped to fuel these local mills as well as others in Greenfield. Shutesbury was the County's highest producer of broom handles in 1845.

Shutesbury is still a town of forests, which cover 90 percent of its total land area. Many of these 15,592 forested acres are owned and managed for privacy, recreation, forest products, and for wildlife habitat and observation. Overall, 37 percent of this forest is owned by the Commonwealth of Massachusetts, under the management of the Department of Conservation and Recreation, as a water supply resource and as state forest, and will remain protected from development as long as it is needed for these purposes. Other forested lands in the southwestern portion of town provide recharge to Atkin's Reservoir, a water supply source of the Town of Amherst.

The forests in Shutesbury are uniquely unfragmented. Large areas of contiguous forest contribute to the rural character of Shutesbury and have attracted people to call the town home. Shutesbury's woodlands provide forest products that support the regional economy. Forests provide residents what they highly value: peace and quiet, clean air and drinking water, lower housing density, walking and hiking trails, rural character and wildlife habitat, according to the results of the Town Plan Survey.

All of these forests, when viewed within a regional context, provide populations of large mammals like moose, deer, bobcat, beaver, and fisher room to roam. This landscape-scale characteristic is largely absent from most communities straddling Rte. 495 in eastern Massachusetts. Shutesbury's forests may help to buffer the already largely contiguous forest blocks of the Quabbin Reservoir Watershed. A loss of forest in Shutesbury and other towns surrounding the reservoir, could translate into a reduction in the region's capacity to provide for wildlife with large home ranges. What makes Shutesbury so special is also what is most at risk from rapid, unplanned development.

The purpose of the Land Use and Zoning chapter is to identify which zoning and non-zoning strategies would be most appropriately applied to ensure that future development patterns support the community's goals. The Land Use and Zoning chapter opens with a review of

land use patterns and development trends in Shutesbury that are described in more detail in the Natural Resources and Open Space chapter of the Master Plan. The Land Use and Zoning Goals and Objectives describe what the Master Planning Committee considers to be the best strategies to consider towards impacting how future development occurs in town. Following this is a review of Shutesbury's current Zoning By-Law. Potential Land Use and Zoning Recommendations follow a brief discussion of Shutesbury's Potential Future Land Use Patterns. The recommendations will identify potential zoning by-law amendments and non-zoning strategies designed to direct future land uses and growth in Shutesbury. This chapter will also include a Potential Future Zoning Map.

Current Land Use Patterns in Shutesbury Reviewed

The current land use patterns in Shutesbury greatly reflect its recent history and follow historic land use trends in the region. Like other upland hill town communities in the region, Shutesbury's population experienced a decline in residents from the early 1800s to the early to mid-1900s followed by a subsequently rapid increase to present day. A large in-migration of new residents seeking good schools and nearby job opportunities caused Shutesbury's growth to skyrocket between 1970 and 2000.

The following bulleted points reflect Shutesbury's land use, population, and development trends over the past thirty years:

- **Shutesbury experienced a high population growth rate 1970-2000.** Between 1970 and 2000, the town's population grew from 489 to 1,810 residents (U.S. Census), which is an increase of 270 percent over 30 years.
- **The number of homes increased by 271 in twenty years.** Between 1980 and 2000, housing demand encouraged the construction of 271 new housing units, an increase of 51 percent. Long undeveloped stretches of major roads made development along them easy.
- **Overall, 618 acres of forest were converted to house lots in thirty years.** The main change to land use during the period 1971 to 2002 was a gain of 533 acres in single-family homes and a loss of 618 acres of forest. This occurred mainly along existing public roads.
- **Most of the new development has occurred outside of the historic village areas and on roadside lots.** In the decade between 1993 and 2002, building permits were issued for seventy-two new dwelling units and more than half of these were on Wendell, Montague and Pratt Corner, Pelham Hill and Locks Pond Roads. This is equal to a yearly increase in dwelling units of around 1 percent.
- **Household size is increasing.** Shutesbury experienced a slight increase in average household size during the 1990s. In comparison, the average household size declined 4 percent in Franklin County and 3 percent across the State.

- **Households with children increased 20 percent in the 1990s.** During the 1990s, the number of households in Shutesbury with children under 18 grew by 20 percent, while in Franklin County overall, the number of these households decreased by 3 percent.
- **Most development is in ANR lots.** The dominant development pattern in town is single-family homes on approval-not-required (ANR) frontage lots. Overall, 93 percent of Shutesbury's housing is in single-family homes.
- **A few small subdivisions have been built in town, all are on private roads, and two include protected open space: Round Hills and the Old Peach Orchard (Old Orchard Road).**
- **The conversion of half the units around Lake Wyola from seasonal to year-round use is possible.** A large concentration of single-family homes exists around Lake Wyola on private roads. It is estimated that approximately half the homes are now used as year-round residences and the other half are family vacation homes. It is suspected that vacation homes will slowly convert to year-round use in the coming years.
- **Shutesbury has more older working professionals.** In 2000, Shutesbury had a higher percentage of people ages 45-64 than Franklin County or Massachusetts overall.
- **Growth over the next twenty-five years is projected to slow to 44 percent.** Shutesbury's population is projected (by FRCOG) to increase by 44 percent between 2000 and 2025 adding approximately 800 people in up to 320 new dwelling units assuming household size remains constant.
- **Based on the assumptions of a maximum build-out analysis, Shutesbury's current zoning could eventually allow up to 10,000 more people to live in town.** The results of the build-out analysis show the potential for five times as many dwelling units as existed in 2000, and almost ten thousand more people given current zoning and the existing amount of protected land. However, this figure assumes that all backland will be developed as ten-acre subdivisions despite current constraints due to soils, slope, and depth to groundwater.

A continuation of the current pattern of development would entail more frontage lots of single-family homes until all of the lands without constraints were developed. Without any more open space protection, this could result in the loss of recreational access to backland forests. Too much access to backland forests could result in overuse and in a reduction of the habitat values associated with forests. Further development pressures might open up backland forest to more development in the form of subdivisions. Were this level of development to occur, many of the values attributed to forests and to the town by residents would be changed forever.

Shutesbury's protection of undeveloped areas is one way in which the community has demonstrated its commitment to preserving its open spaces, natural resources, and rural characteristics and landscapes. Fortunately, the eastern third of the town is protected by the Department of Conservation and Recreation, Division of Water Supply Protection (formerly the Metropolitan District Commission (MDC)), but the remaining land is vulnerable to development. Within these areas, there are over six thousand acres of land in the Chapter 61 Program, mostly owned by W.D. Cows, which together provide access to a network of trails, and which contain BioMap Core habitats for rare species, prime forestland soils, aquifers, and potential future water supply areas. Conserving these open space areas is a prime directive of the Town Plan Survey results.

Zoning provides one means for Shutesbury to conserve these important town features while encouraging development and land uses in a manner that agrees with the community's values and its vision for the future. The town's zoning by-law is summarized in this chapter. The summary description of the zoning by-law is intended to clarify for the reader how the existing zoning promotes the community's vision and goals, and whether by-law changes may be needed to discourage patterns of development that do not support the goals of the town as expressed in the Master Plan Goals and Objectives.

Land Use and Zoning Goals and Objectives

The Land Use and Zoning goals were developed and approved by the Master Planning Committee in January 2002. The draft objectives have been developed through a careful review of the recommendations presented in the previous chapters of the Master Plan. The Land Use and Zoning chapter represents a synthesis of the work presented in earlier chapters, and an evaluation of the ways that Shutesbury's current land use and zoning policies could be revised to better support the town's goals and vision for its future.

Goal A: To protect the rural character and working landscapes of Shutesbury, while allowing landowners to develop suitable portions of their land.

Objectives:

- Design a draft Forest Conservation Overlay District, for the purpose of conserving forests and their wildlife habitat, forest products, and recreational values.
- Determine which critical resource areas would be best protected through the acquisition of conservation easements or lands in fee, and which would be best protected by a Forest Conservation Overlay District that could have conservation development design as the by-right development option.
- Continue to plan, develop, and maintain trail linkages over land and water to enhance the recreational experiences of residents. Trail systems should be designed to prevent over-development, which would lead to impairment of the values the Town Plan Survey indicates are desirable.

- Develop a roadside fence by-law that allows for review of proposed tall fences that block viewsheds and scenic lands and may create road visibility issues.

Goal B: To protect the Town's natural resources and open space through appropriate zoning and subdivision measures.

Objectives:

- Design a draft Water Supply Protection Overlay District to protect current and ground and surface water supplies.
- Identify areas in Shutesbury that might be prioritized for town-acquisition to protect potential future water supplies (areas of undeveloped forest atop estimated low to medium-yield aquifers) from development.
- Ensure that all town policies reflect the use of best management practices for the purpose of protecting against groundwater contamination.
- Organize resources and develop methods for maximizing the town's effectiveness in protecting parcels of land that contain priority values as described in the Natural Resources and Open Space Chapter's recommendations, such as re-establishing annual contributions from tax revenues to a Chapter 61 land purchase program managed by the town as a whole.
- Revise the existing town by-law to prohibit the storing of more than two, non-registered vehicles on land under one ownership as a means of protecting groundwater from contamination and provide an enforcement provision with exceptions as described in a Major Home Occupation by-law.
- Adopt the Community Preservation Act.

Goal C: To encourage small business development in a manner that does not reduce residents' quality of life.

Objectives:

- Encourage entrepreneurship and business development in Shutesbury through zoning.
- Investigate the need for a local small-business support space in town.
- Include a small business support center within a new public library.
- Continue to advocate for advanced telecommunications broadband services to be made available in the community.

- Determine the potential for developing business ventures that would create revenue for the Town, by leasing municipally owned land, by municipal ownership and operation, or by private sector contribution to the tax base.
- Allow home businesses to build structures or facilities that may not completely resemble residential structures as long as they do not detract from the nature of the neighborhood. This could increase the amount of taxable property without incurring a lot of additional municipal services.

Goal D: To develop a system of land-use controls, which will best manage the acceptance of new development in the community.

Objectives:

- Identify the parts of town that may be the most suitable for new housing development.
- Identify suitable areas for affordable housing for seniors at an appropriate scale for the community.
- Promote a diversity of housing choices that will meet the needs of current and projected future residents.
- Revise the zoning by-laws to encourage more housing options for seniors, including accessory apartments and senior housing.
- Revise the zoning by-laws to include overlay districts that protect sensitive environmental, scenic, and historic areas from residential development patterns that could be detrimental to these assets.
- Consider adding a Town Center District that would encourage development consistent with existing patterns, and which could potentially allow appropriately scaled commercial uses desired by the community (home businesses, bed & breakfast, arts & crafts, dentist/doctor/veterinarian, restaurant/coffee shop, gas station (bio-diesel station)/convenience store).

Current Zoning Districts and Zoning Regulations

Zoning districts and zoning regulations affect the character of a community and how the community develops and grows over time. The Town of Shutesbury established its zoning code in 1972, and has made a number of revisions and amendments to the code over the past thirty-two years. Shutesbury’s zoning by-law, and its guidance on the permitted and prohibited land uses in town, the minimum lot sizes and setbacks, and the special regulations,

have influenced the development patterns in the community during the past three decades, and have played a role in the land use trends and changes that were discussed in the last section. The zoning by-laws will also affect the way the town develops in coming decades, as is discussed in a section of this chapter, Potential Future Development Patterns.

Purpose of Zoning

Shutesbury's zoning should reflect and promote the community's vision for itself. Shutesbury's Vision Statement for the Year 2020, which was developed by the Town Plan Committee in January 2002 as part of the Master Plan Goals and Objectives is included below with several key concepts relating to zoning and land use in bold italics:

Shutesbury is a community whose members are united by the manner in which they care for their environment and for each other. ***Residents seek to enhance their own lives by protecting what they value most about Shutesbury's rural character and by developing creative ways to ensure the provision of quality community-wide services.***

Shutesbury residents value their natural environment. ***Expansive areas of forest linking the Quabbin lands to large blocks of open space, all permanently protected from development, provide a network for hiking, non-motorized biking, and walking throughout town.*** The forests also tend to have a moderating effect keeping temperatures slightly cooler in the heat of summer than down in the valley. Community volunteers monitor the quality of all water bodies, wetlands, and certified vernal pools annually.

Although people continue to move to Shutesbury because it is so attractive, ***the numbers, locations, and types of housing are restricted to clusters of small lots, and large lots with plenty of frontage.*** This keeps the number of new lots being developed thankfully far behind the number of acres the community is protecting. However, because Shutesbury residents value diversity, the town has ***promoted the limited development of federally subsidized housing for first-time homebuyers and the elderly.*** Shutesbury has ***two elderly housing developments built using existing historic structures.***

Locks Village, the most densely populated portion of town is among the few areas of Shutesbury with municipal water and sewer. Several neighborhood treatment facilities process wastewater and village wells are an efficient and cost effective way of ensuring the supply of clean drinking water.

One of the most active organizations in Town is the Shutesbury Recreation Commission. Beyond the traditional holiday events that every town has, the Shutesbury Rec. Commission provides monthly recreational events from movies, to food festivals, and arts fairs, and for the whole family. The Commission has also developed additional areas used as sports fields and picnic areas. Adventure and environmental education is another of the Commission's specialties using the expertise of many community members. Shutesbury just seems to attract people who care about the environment.

Shutesbury residents have worked hard to integrate the protection of their historic buildings, important scenic view sheds, and landscapes by making sure that new economic development pays to sustain these resources. Some of ***the community's most historic structures have been reused and maintained by expanding home businesses.*** The town's ***efforts to assist***

forestry and agricultural businesses to succeed, has benefited the community by keeping working landscapes undeveloped.

One way Shutesbury has encouraged local economic development is by lobbying companies to ***build high speed Internet and telecommunications infrastructure without reducing the local aesthetics***. As a result, the ***number of successful small home businesses has increased steadily causing a reduction in residents' commuting time, and a higher level of dependency on the local market, café, and fuel station***. Thankfully, Shutesbury realized the need for building a constituency for public transit so that now, many residents take advantage of the inexpensive electric bus fares.

Shutesbury residents pay property taxes that are on par with surrounding communities.

However, as any resident will tell you, the level of community services provided is excellent. The award winning elementary school, full time police and fire departments, well-staffed and equipped highway departments, and modern town offices are hard won benefits resulting from residents choosing the services they need, developing revenues sources beyond residential property taxes, and from implementing an aggressive land protection program.

Shutesbury is a vibrant yet rural, small-town community with top-notch services.

Another set of concepts that may be used to assess whether the town's current by-law effectively promotes public benefits and purposes common to many communities can be found described under "Public Purposes" of the Third Iteration, or draft, of the Massachusetts Land Use Reform Act (MLURA), Section 2b. Although the public purposes section of the MLURA (which follows) could potentially apply to zoning across the Commonwealth, many of the values listed below appear to be consistent with the Master Plan Goals and Objectives (*italics mine*):

(b) Public Purposes

Cities and towns have authority to adopt zoning ordinances and by-laws for the protection of the public health, safety, and general welfare. Cities and towns have authority to advance some or all of the zoning applications listed below and may advance other zoning applications not so listed as they deem appropriate.

- (1) Implementation of a plan adopted by the city or town under section 81D of chapter 41.
- (2) *Orderly and sustainable growth, development, conservation and preservation which promote the types, patterns and intensities of land use contained in a plan adopted by the city or town under section 81D of chapter 41;*
- (3) *The efficient, fair and timely review of development proposals, including standardized procedures for administration of zoning ordinances or by-laws.*
- (4) *The efficient resolution of planning and regulatory conflicts involving public and private interests.*
- (5) *The use of innovative development regulations and techniques such as development agreements, development impact fees, design review, inter-municipal transfers of*

development rights, agricultural zoning, inclusionary housing, mediation and dispute resolution, and urban growth boundaries.

- (6) To *balance and delineate urban and rural development*.
- (7) The achievement of a *balance of housing choices*, types and opportunities for all income levels and groups, including the preservation of existing housing stock, and the *preservation of affordability in housing*.
- (8) The *integration of residential with commercial*, civic, cultural, recreational and other compatible land uses at locations that *reduce dependence upon the private automobile*.
- (9) The adequate provision and distribution of educational, health, cultural and recreational facilities.
- (10) The *preservation or enhancement of community amenities* or features of significant architectural, historical, cultural, visual, aesthetic, scenic or archaeological interest.
- (11) The *protection of the environment and the conservation of natural resources*, including those qualities of the environment and natural resources set forth in Article 97 of the Massachusetts constitution.
- (12) The *retention of open land for agricultural production, forest products*, horticulture, aquaculture, tourism, outdoor recreation, and fresh and marine fisheries.
- (13) The *protection of public investment in infrastructure* systems.
- (14) An *energy efficient, convenient and safe transportation infrastructure* with as wide a choice of modes as practical, including, wherever possible, maximal access to public transit systems and non-motorized modes.
- (15) *Efficiency in energy usage and the reduction of pollution* from energy generation, including the *promotion of renewable energy sources* and associated technologies.
- (16) The *adequate provision of employment opportunities* within the city or town and the region including redevelopment of pre-existing sites, *home-based occupations, sustainable natural-resource-based occupations, and housing to support the employment opportunities* within the city or town and the region.
- (17) The conservation of the value of land and buildings, including the prevention of blight and the rehabilitation of blighted areas.
- (18) The *accommodation of regional growth in a fair, equitable and sustainable manner* among municipalities, including coordination of land uses with contiguous municipalities, other municipalities, the state, and other agencies, as appropriate, especially with regard to resources and facilities that extend beyond municipal boundaries or have a direct impact on other municipalities.
- (19) The Implementation of a plan adopted by a regional planning agency under section 5 of chapter 40B.

Shutesbury's Zoning By-law Explained

The Town of Shutesbury's Zoning By-law (as of 2003) is thirty-one pages with two amendments attached at the back of the by-law for a total of thirty-nine pages. There are seven sections, plus the two amendments. There is no table of contents. The seven sections and two amendments are:

Section I: Purpose and General Regulations

Section II: Establishment of a Zoning District and Use Regulations

Section III: Special Regulations

Section IV: Dimensional Requirements for Lots

Section V: Enforcement and Administration

Section VI: Driveways and Curb Cuts

Section VII: Definitions

"Back Lots with Open Space Setaside" amendment to Shutesbury Zoning By-laws

Shutesbury Telecommunications Tower By-Law

Section 1: Purpose and General Regulations

The section "A. Purpose" of the by-law is to "promote the health, safety, convenience and general welfare of the inhabitants of the Town of Shutesbury." Further, "to protect the community, to encourage the most appropriate use of land and to promote sound growth," the by-law seeks to regulate land use and the "construction, alteration, size, location, and use" of buildings and structures in town.

The "Basic Requirements" state that any building or structure that is modified or built, as well as every new use of land has to conform to the by-law. It also notes that any use not mentioned in the by-law should be considered as prohibited and that an ANR plan filed prior to May 7, 1988 only has to comply with the zoning by-law in existence the day before.

Similarly, "Non-Conforming Uses" states that a legal use of a building or land at the time of an amendment to the by-law can continue without needing to conform to the amendment. The by-law continues that outside of a single-family or two-family house, a non-conforming use cannot be modified without getting a permit from the Board of Appeals.

On pages two through five, the by-law graphically describes how changes can be made by right to a single or two-family house. It is shown that changes are allowed by right within the setback areas if they do not result in any reduction of the distances between the structure and the lot lines. As well, the tallest part of the alteration cannot be higher than the existing building. The first section finishes with two points: 1) A non-conforming use that is abandoned for two years can not be re-established without complying with zoning; and, 2) A non-conforming use destroyed by fire can be rebuilt within three years as long as it is not bigger.

Section II: Establishment of a Zoning District and Use Regulations

This section begins by stating that the entire town is designated as a Rural Residential District. It then describes the uses that are allowed by right (without the need of a special permit), which include:

- Single and two-family dwellings, provided that the sanitary infrastructure, off-street parking, and structure meets minimum state and local standards;
- Private and / or for-profit farm and forest-based uses as long as any retail sales deal with mostly site-grown goods and are located far back from the road;
- Governmental, educational, religious, or other non-profit institutional uses;
- Conservation land for water, water supply, plants, and wildlife; and,
- Accessory uses.

Accessory uses including home occupations, fenced swimming pools, room rentals, and uses that involve assembly work, crafts, art, or light manufacturing by residents, are acceptable as long as they could be considered as incidental to uses that are already allowed (*see above bullets*) and that they are not “detrimental” to a residential neighborhood. The accessory use would need to have the following characteristics to be allowed: 1) Not visible from the outside and no merchandise on display; 2) No more than five non-family employees; 3) Adequate parking exists; and, 4) It preserves the “residential character” of the neighborhood.

The last part of this section, “Uses Which May be Allowed,” begins by describing the protocol that must be followed to apply for a permit from the Zoning Board of Appeals. It also states that uses that cause undue traffic congestion or land erosion, or appear to be hazardous, injurious, noxious, detrimental or offensive are expressly prohibited. This is then followed by a numbered list of the sixteen uses, which require a special permit from the Board of Appeals. These uses center on recreation, child care, elder care, health care, pet care, hair care, utilities, tourism and hospitality, conversion of pre-1972 homes to two-families, other retail and consumer services, scientific research, and commercial camping with conditions.

Section III: Special Regulations

In this section, the by-law includes regulations for signs, parking, and rate of development. It also lists uses that are prohibited. The sign regulations list the characteristics of signs that are allowed in town: number per family, business, or per type of use; size in square feet; height from ground; design; materials used; level of motion employed. The parking regulations state that each parcel of land with a need must have at least two, off-street parking spaces with adequate on-site stormwater disposal. The prohibited uses can be summarized into several main categories:

- 1) More than one principal use on any one lot;
- 2) Use of a trailer or mobile home as a dwelling with listed exceptions;
- 3) Trailer or mobile home park;
- 4) Deep basement dwellings;
- 5) Commercial junk or refuse yards;
- 6) Hazardous signs or floodlights;

- 7) Shrinking a lot below minimum requirements for a principal use; and,
- 8) Multi-family housing with more than two dwelling units.

The “Townwide Rate of Development” sub-section is the final part of Section III. Its purpose is to: encourage annual residential growth consistent with the average annual rate experienced between 1996-2001; schedule new development to allow the town to provide basic public services, while preserving and enhancing the town’s rural character, its safety, health, and property values; and, ensure an equitable distribution of permits.

In general, this regulation states that building permits will only be issued for six new dwelling units in each year from 2002-2006 based on a set of procedures:

- Only one dwelling unit-permit can be applied per person/entity, per month;
- The timing of permit issuance is the last day of the week that the Franklin County Cooperative Inspection Program offices are open in order of submission;
- One or more permits may be issued per week; and,
- Affordable units proposed by a public, state or federally subsidized agencies are both exempted from this regulation and count towards the maximum of six permits to be issued per year.

Section IV: Dimensional Requirements for Lots

Lot dimensional requirements for both single-family dwellings and two-family dwellings are listed in Table 7-1 below.

Table 7-1: Dimensional Requirements for Lots in Shutesbury

Structure	Min. Lot Size(sq. ft.)	Frontage (ft.)	Side and Rear Yards (ft.)	Front Yard	Width of Lot *
Single-family	90,000	250	25	75	50
Two-family	180,000	500	25	75	50

Source: Shutesbury Zoning By-Law; 2003. Note: * In an area of the lot between frontage and the dwelling. In situations where an application is made to change an existing use (e.g. conversion of a one-family to a two-family dwelling), the MGL Ch. 40, Section 6 apply.

Section V: Enforcement and Administration

This section describes how the by-law is intended to be enforced, the legal requirements associated with building permits, and the establishment and activities of the Board of Appeals. This section states that the by-law is enforceable by the Building Inspector and that, “No building or structure shall be erected, altered or moved and no major use of land or building shall be commenced unless a building permit has been issued by the Building Inspector.” With each permit application, a plan must be filed with the Inspector that shows the lot, its location, and its adherence to dimensional and sanitary requirements.

The by-law lists the Building Inspector’s basic requirements and enforcement options:

- 1) Substantial construction must start within six months of permit issuance and continue towards completion;
- 2) Each permit is valid for two years only;

- 3) By-law violators may be fined up to \$300 per offense per day;
- 4) Notice of offence must be delivered by Inspector or by registered or certified mail; and,
- 5) Other enforcement options as included in MGL Ch. 40A, Section 7 and, Chapter 40, Section 21D.

Table 7-2: Officials and Agencies Required to Sign Off on a Permit Application in Shutesbury and Their Associated Legal Requirements

Agencies or Officials from which signatures are typically required	Legal Requirements
Conservation Commission	Massachusetts Wetlands Protection Act Any local wetland by-laws and related regulations
Board of Health	State Sanitary Code Any local Board of Health regulation
Fire Department	Safe and appropriate smoke detection system
Building Inspector	Driveway regulations and curb cut provisions in Section VII of by-laws; Zoning By-laws; State Building Code and any other legal requirements not specified above

Source: Shutesbury Zoning By-Law; 2003.

In addition, the by-law states that all applications for building permits need to document the compliance of agencies or officials, via their signatures, unless the Inspector has received a written indication that a particular signature is not required or, he/she may decide that a signature is not necessary for a minor remodeling project. The officials and agencies that need to sign off on a permit application are in the left column and their associated legal requirements are in the right-hand column.

Other enforceable sanitary requirements listed in this section include: 1) Building permits will not be issued for the new buildings that need drinking water unless they have access to a public or private water supply system or well; and, 2) A sewage disposal permit by the Board of Health must be acquired before a building permit can be issued.

A sub-section establishes a Board of Appeals and stipulates its form, purpose, and the provisions for Appeals, and for the granting of Special Permits and Variances. The by-law states that the Board should hear and decide an appeal presented by a person who has been unable to obtain a permit from any administrative official or board or by any decision of a town entity in violation of Ch. 40A (the Zoning Act) or of the by-law.

Other than hearing appeals, the by-law describes the actions of the Board of Appeals involving the granting of Special Permits and Variances, and lists requirements of each and the sections of the Zoning Act that govern the former.

Special permits are governed by MGL, Ch 40A, section 6 and 9. Section 6 allows that a special permit for the alteration or extension of a pre-existing, non-conforming use may be allowed if the Board of Appeals finds that the alteration would not be substantially more detrimental than the existing structure to the neighborhood. Special permits must be granted if the non-conforming, pre-existing use is a single- or two-family structure and the extension does not increase the non-conforming nature of the structure.

Section 9 covers other special permits that deal with new structures or uses or both, that require it to be in harmony with the general purpose and intent of the by-law (*see Purpose*). Special permits can impose conditions and safeguards and limitations on time or use. For example, a special permit will lapse in two years from the date it is granted by the Board of Appeals, unless a substantial use has begun or construction has started. Accessory uses to an allowable use can be granted a special permit if it does not substantially detract from the public good. Other allowances for the granting of a special permit are stipulated that ensure that it reflects the purposes of the zoning by-law.

The by-law also includes a provision that the Board of Appeals can allow a variance from the terms of the by-law when strict adherence to the by-laws would result in an unnecessary hardship, as long as the action was not contrary to public interest. The by-law describes the administrative procedures and requirements for granting a variance, and the responsibility of the applicant to demonstrate a compelling argument for relief.

Two final administrative sub-sections describe how the by-laws can be amended (at any annual or special town meeting) and the terms of validity, which stipulate that this by-law is valid even if it imposes a greater restriction than other by-laws, and if any one part of the by-law is held invalid, the remainder continues in full force.

Section VI: Driveways and Curb Cuts

This sub-section of the by-law includes the regulation of driveways in regards to: when they need to be designed and constructed in relation to permit approval; driveway location spatially, relative to the lot; grade to and from the street line; width; and drainage. The by-law also stipulates the conditions that would require, and trigger issuance of, a special permit for the creation of a new road or driveway—for a private road or driveway that abuts a town maintained public way. In addition the by-law states: 1) The Building Inspector must either issue the permit within forty days or communicate a denial of the permit in writing; 2) A permit is required from the Highway Superintendent only, if the curb cut is for an agricultural, forestry, or other use not involving construction; and, 3) The applicant must submit to the granting authority a scaled drawing containing all required information, some of which is listed in the by-law.

This section also includes requirements for Common Driveways. The by-law states that a common driveway must be contained within, and can connect, up to four lots, which all must meet frontage requirements. A special permit is required from the Board of Appeals to develop a common driveway and as a part of the permit process the applicant must provide evidence and guarantees that it will be constructed to high standards and be maintained in perpetuity in an equitable manner by the parties being served.

Section VII: Definitions

This section of the by-law provides brief definitions for each of the following terms:

Accessory Use or Building, Building, Common Driveway, One-Family Dwelling, Two-Family Dwelling, Family, Farm, Frontage, Habitable Floor Area, Junk Yard, Lot, Signs, Street, Structure, Trailer or Mobile Home, Variance, Front Yard, and, Substantial Start of Construction.

“Back Lots with Open Space Setaside” amendment to Shutesbury Zoning By-laws

The Back lots with Open Space Setaside (BOSS) by-law has six sub-sections: Purpose, Eligible Parcels, General Description, General Requirements (which go into detailed requirements), Common Driveway Standards, and Conservation Restriction Requirements.

The purpose of the BOSS by-law is to:

- Encourage efficient use of land with new residential development;
- Increase opportunities for open space protection for agriculture and forestry;
- Preserve scenic qualities of Shutesbury; and,
- Protect and enhance property values by providing landowners the opportunity to design and create appropriate ownership, use, and development patterns that are amenable to public approval.

An owner or developer with contiguous parcels of land, which comply with ANR development requirements and which may also be separated by a public way if they are under the same ownership, can request a special permit from the Planning Board to create back lots that:

- Are each a minimum of 90,000 sq. ft. in area;
- Have no, or a reduced, roadway frontage;
- Are accessible from a public way via a deeded right-of-way across land of others, which will be a common driveway serving up to 4 back lots; and,
- If more than one, will be developed to be compact.

The by-law requires the applicant to place a conservation restriction on the same number of ANR lots, each having a minimum of 90,000 sq. ft. in area and 250 ft. of lot frontage, for each back lot created. The ANR lots created must be contiguous and have a minimum 200 ft. depth measured from the centerline of the road, which can be modified to compensate for site characteristics at the Planning Board’s discretion. This section of the by-law lists even more detailed requirements of a special permit by the Planning Board in accord with the BOSS by-law including criteria to be met by a BOSS proposal, common driveway standards, and conservation restriction requirements.

“Shutesbury Telecommunications Tower By-Law” amendment to Shutesbury Zoning By-laws

This amendment to the zoning by-law includes nine sub-sections: 1) Purpose and Goals, 2) Definitions, 3) Exemptions, 4) General Guidelines, 5) Siting and Height Requirements, 6) Design Requirements, 7) Application Process, 8) Approval, and 9) Conditions of Use.

The purpose of the Telecommunications Tower By-Law is to establish guidelines and a permitting process for any type of tower. The goals of the by-law are to ensure that a minimum number of new towers are effectively sited on town land or on existing locations, and in a manner that reduces their visual and environmental impacts and that makes available telecommunications service and tower locations to the community and to local municipal agencies, respectively.

The following terms are defined within the by-law: distance; FAA; FCC; height; non-residential structure; wireless communication building, device, facility, and structure; applicant; application; telecommunications service provider; and, tower.

Under exemptions, the by-law explains that all towers in the town are required to comply with the by-law except for those towers that are used for town or state emergencies, licensed for amateur radio use, or used for personal television reception or wireless telecommunications.

The General Guidelines describe more specifically how towers and wireless telecommunication facilities can be located in town with a Special Permit from the Planning Board. It offers guidelines describing tower location, design capacity, and building dimension and use limits and requirements. It also prohibits the siting of TV, telecommunication or radio broadcast systems. More specific setback, location, height, and due diligence requirements are detailed in their own sub-sections.

Under the Application Process sub-section, the specific procedures and requirements for submitting an application for a special permit from the Planning Board is described. Some of the basic points included in this sub-section are the following: Expiration of the permit occurs if the facility is not constructed within two years of issuance; Failure to supply all information in a timely manner is grounds for permit denial; Applicants need to submit site and engineering plans, a map showing service area of proposed facility, locus map, soil and surficial geology maps, a narrative report, proof of approval of other necessary permits, an on-site demonstration showing future visibility if the facility, and potentially, payment for the review of a technical expert. Certain plan and information requirements are repeated in a different format on the following page (7) of the amendment. Additional specific requirements are included that apply to siting wireless communication devices on existing towers or structures.

The Approval sub-section provides that prior to granting a special permit, the Planning Board must find that the applicant has met all the requirements and that the facility has met the goals of the by-law. The applicant must post both a construction bond and a maintenance bond, comply with all federal, state, and local regulations, and agree to remove and repair the facility based on the Conditions of Use.

Shutesbury's Potential Future Land Use Patterns

“Shutesbury is a vibrant yet rural, small-town community with top-notch services.”

-Excerpt from the Shutesbury Town Plan Vision Statement: Shutesbury in the Year 2020.

The following section introduces potential land use and zoning recommendations with a brief discussion on the relationship between development, land use, and the characteristics and resources of the community that can be conserved and enhanced through zoning and non-zoning measures.

Shutesbury's zoning by-law has created the pattern of development seen today (*see discussion on page two*). Amendments have been added to the town's zoning by-law to provide the town to plan for growth for a period of time (Townwide Rate of Development By-law), deal with opportunities to protect roadside open space (Back Lots with Open Space Setaside), and manage potential threats to the town's rural character (Shutesbury Telecommunications Tower By-Law). However, the current zoning by-law does not effectively promote or retain the town's rural, small-town characteristics. It does not ensure the retention of large blocks of protected forest most valued by residents for recreational purposes, protect community water supplies, nor promote a diversity of housing choices. In short, the town's zoning is not currently designed to sustain Shutesbury's rural character over the next ten years and beyond.

The potential impacts of the current development pattern in Shutesbury are inconsistent with the Master Plan Goals and Objectives. If the current development pattern is allowed to proceed, all the land that could be developed may end up accommodating mostly traditional subdivisions of single-family homes on two-acres lots with 250 feet of frontage. According to the build-out analysis described in Chapter 1-Natural Resources and Open Space, the town's current zoning by-law could accommodate 10,000 more residents in subdivisions that would create 84 miles of new roads.

The Town of Shutesbury can guide the use of the land within its borders to sustain desirable community characteristics. The town should continue to seek consensus on priority issues and on the methods to be used to advance the town's collective vision over time. However, for the purposes of the Master Plan, the goals and objectives serve as a source of consensus on the most important issues and the recommendations, the most appropriate solutions.

Shutesbury's ideal land use pattern might simply be a modification of the current one to include a reduction in the risk of traditional large lot residential sub-divisions and the intentional concentration of development in areas that already exhibit higher densities. Through the adoption of zoning and non-zoning measures, Shutesbury could protect forests from fragmentation and public access to woodland-based recreational and economic activities, conserve ground and surface water supplies, maintain housing affordability in the community, and promote small home-based businesses.

According to the Town Plan Vision Statement, a more ideal future development pattern could be described as one that has *“clusters of small lots and large lots with plenty of frontage.”*

The potential for encouraging a development pattern different than approval-not-required frontage lots and traditional subdivisions could be more easily realized were the State Legislature to enact the Massachusetts Land Use Reform Act (MLURA), which would allow for more flexibility in the development of town-appropriate zoning. However, even without the benefits that would be gained from an enacted MLURA, the town may be able to shift to a more desirable pattern via changes in zoning and in the level of land protection activities in town.

Before describing land use and zoning recommendations, it is important to clarify the characteristics to be promoted via zoning and non-zoning strategies that are consistent with the Master Plan recommendations and Goals and Objectives:

- The retention of large blocks of contiguous (undeveloped) forests;
- Slow and steady growth in appropriate areas;
- Clusters of small lots potentially near protected forestland;
- Roadside development of single-family and two-family dwellings on lots 2 acres in size with 250 feet of frontage;
- Concentrations of higher density lots in an expanded Town Center;
- An expanded Town Center area with municipal/civic, small-lot residential, and small commercial business uses along Leverett/Cooleyville Road from Town Center to Pratt Corner Road;
- Small scale 5-7 unit senior housing development around Lake Wyola, the Town Center area, or other suitable areas;
- Accessory apartments associated with owner-occupied single-family detached dwellings, allowed in all areas; and,
- Small home business uses with expanded allowances in all areas.
- Low density development with appropriate safe guards in the watershed protection and forest conservation overlay districts.

Land Use and Zoning Recommendations

The following Land Use and Zoning Recommendations focus on promoting Shutesbury's small town, rural character. Although many of the Master Plan recommendations relate to land use in town, and seek to sustain or enhance elements of the community most valued by residents, the following describe potential amendments to Shutesbury's Zoning By-law as well as changes in land use and conservation policies that could help the town meet its goals.

The three fold-out maps at the end of the chapter are the Land Use Map, Zoning Map, and Potential Zoning Map. The Potential Zoning Map shows the town broken into two main use districts: the Rural Residential District and the Town Center District. There are also two overlay districts presented: Forest Conservation Overlay District and the Water Supply Protection Overlay District. The descriptions of these proposed districts are found in the following recommendations:

- **The Shutesbury Planning Board develops and seeks to have Town Meeting adopt the following by-laws:**

- **A Phased Growth By-law** is adopted to ensure that growth occurs in an orderly and planned manner that allows the town time for preparation to maintain high quality municipal services for an expanded residential population while allowing a reasonable amount of additional residential growth during those preparations. Phased growth by-laws seek to manage the amount of residential growth in a community during a specific time period. Rapid rates of growth can have adverse impacts on the costs of municipal services like education and on the rural character of town. Overbuilding can increase school enrollment beyond its capacity, which could lower the quality of service for the existing residents as well as require a costly expansion of the elementary school. Any expansion of the elementary school would need to overcome significant site constraints, one of which is the proximity of the school's drinking water supply.

Phased growth by-laws seek to control growth in a variety of ways. One technique is to limit the amount of residential permits for new dwelling units issued each year, as Shutesbury presently does with its Townwide Rate of Development By-law, which provides for no more than six permits per year for new houses. Other phased growth by-laws include "phasing in" the number of units that can be built in a subdivision, often depending on the size of the development project. An even more sophisticated approach, such as that used by Amherst, Massachusetts, awards development credits using a points system. Points are awarded based on many factors, such as the provision of low income housing units or open space, proximity to the Town Center, and aquifer protection measures. The points are then used to determine how quickly the development will be built.

Shutesbury could design its Phased Growth By-law to contain the types of mechanisms used in the Amherst by-law: a yearly cap, a phasing in of both traditional and conservation development subdivisions, and a point system that promotes the publicly held values expressed in the Master Plan (e.g. affordable housing, contiguous forests, and water supply protection).

- **A Town Center District** (*see Potential Zoning Map*) promotes residential development at a higher density than is currently allowed in the Rural Residential District and the concentration of existing and future civic uses including police, fire, highway, senior housing, and library uses. The Town Center District could potentially contain appropriately-scaled commercial businesses considered desirable by a majority of community survey respondents including home businesses, bed & breakfast, arts & crafts,

dentist/doctor/veterinarian offices, a restaurant/coffee shop, and a gas [or bio-diesel] station/convenience store. The Town Center District could also be the “receiving zone” of a local Transfer of Development Rights (TDR) By-law. For example, developers could be allowed to build at a density of one acre per dwelling unit or greater within the Town Center District, which is half the current minimum lot size, for every 10 acres of land protected with a conservation restriction in one of the proposed critical resource areas identified in this Master Plan (e.g., the Forest Conservation Overlay District, the Water Supply Protection Overlay District, and the Lake Wyola Sub-watershed Overlay District).

- **A Water Supply Protection Overlay District for the Atkins Reservoir, Dean Brook and Nurse Brook Sub-watersheds** (*see Potential Zoning Map*). The Adams Brook sub-watershed includes the basins of Atkins Reservoir, Nurse Brook, and Dean Brook. These three basins drain into the Atkins Reservoir that, when full, drains into Adams Brook. The Town of Amherst can divert water from Dean Brook into the Reservoir. The three sub-basins contribute recharge to Atkins Reservoir, a drinking water supply for the Town of Amherst. Shutesbury residents value the protection of all drinking water supplies but in particular, Amherst’s because of the regional school district and the many Shutesbury residents who work at UMass and in Amherst. A Water Supply Protection Overlay District could have within its design the regulation of land uses that pose a threat to surface and groundwater quality within the sub-watersheds.

- **A Forest Conservation Overlay District for large unprotected blocks of forest in town, which would have conservation subdivision design as the by-right or easiest development option** (*see Potential Zoning Map*). Certain areas of town that contain large contiguous forest blocks could become the future location of a Forest Conservation Overlay District in recognition of the very unique and important resources that contiguous forests provide the community. A Forest Conservation Overlay District could require developers submit to the Planning Board both a traditional subdivision plan and one that uses conservation subdivision design, with the understanding that the latter would enjoy preference. The Forest Conservation Overlay District could be linked to the Phased Growth By-law by awarding points for each 10 percent reduction in the share of the total parcel used by development. In addition, points could be awarded to those developments that provided public access to open space lands for recreation purposes.

The Planning Board and Master Planning Committee members have agreed on a potential location for a Forest Conservation Overlay District. Based on current GIS information, the 2000 Town Survey results, the town’s land acquisition criteria, and the Land Use Suitability Map, the District could be located west of Wendell and Lockes Pond Road and north of Leverett Road. It could encompass one of the larger blocks of contiguous forest the town

shares with Leverett, a BioMap Core Habitat Area, Montague Road, and one of the greatest concentrations of critical natural, forest management, and recreational resources, the values of which would be most greatly impacted by conventional subdivision design.

One of the ways this overlay district could help to conserve undeveloped contiguous forest acreage and promote forest management and recreational uses, is by decreasing allowable development densities to a level appropriate to those values. A developer could be permitted to build at a higher density if certain conditions were met, including protecting a particular share of the forested parcel with a conservation restriction.

In addition, the Forest Conservation Overlay District could be a “sending zone” as part of a town-wide Transfer of Development Rights (TDR) by-law. The town could adopt a TDR by-law that would encourage developers to build at higher densities within a Town Center District (the “receiving zone”) in exchange for protecting forest from development in the Forest Conservation Overlay District, within the Water Supply Protection Overlay District, or within the Lake Wyola Sub-watershed. The TDR by-law could allow a developer to build at a higher density in the proposed Town Center District in exchange for protecting open space in one of the overlay districts.

- **A Lake Wyola Sub-watershed Overlay District** (*see Potential Zoning Map*). The Lake Wyola Sub-watershed Overlay District would include all the land within the basin of the same name, in the northwestern portion of town. The overlay district could be designed to address both the need to protect the quality of surface and groundwater within the sub-watershed and Lake Wyola itself, as well as the potential need for establishing equitable land use regulations for the developed portion of the basin.
- **A Transfer of Development Rights (TDR) By-law.** TDR is used extensively across the country but relatively little in this state. With a TDR By-law, new development can be encouraged in specific areas while being discouraged in others. For every acre of land a developer protects in a “sending zone,” which could be one of the critical resource protection areas, the developer receives the right to develop at a higher density or at a faster rate than is typically allowed by current zoning in a “receiving zone,” which could be the proposed Town Center District.
- **A Conservation Subdivision Design (CSD) By-law.** Conservation Subdivision Design could be used as part of the Forest Conservation Overlay District alone or, as a town-wide measure. CSD would encourage housing to be grouped on smaller lots and result in a large share of the total parcel being protected from development. A CSD could result in the same number of lots as would occur in a conventional subdivision plan but with less road

infrastructure, less impervious surfaces, and more contiguous forested open space.

- **An amendment that promotes the development of accessory apartments.** An increase in accessory apartments could result in more housing choices for residents of different ages and economic backgrounds as well as help the town increase its share of “affordable” units under Chapter 40B. Accessory apartments associated with owner-occupied single-family detached dwellings could be the focus of the amendment. Accessory apartments could also provide for increased incomes for low and moderate -income homeowner households with burdensome housing costs.
- **A Major Home Occupations By-law** that might encourage the expansion of home business operations in town. The Town of Shutesbury has a high concentration of home-based businesses relative to the region. These businesses represent Shutesbury’s local economic engines, which produce services and products that import wealth into the community. The Economic Development chapter includes recommendations to support home-based business expansion through incubator-types of services and spaces, by promoting consumption of local goods and services, and by encouraging hi-speed Internet capacity for Shutesbury business owners and residents. An amendment to the Zoning By-law might include more allowances for accessory home business uses including detached structures that may not appear completely residential in nature along with parking, sign, and aesthetic requirements that would continue to sustain the community’s rural character.

A Major Home Occupation, according to the Rutland, Massachusetts by-law, may have one more of the following characteristics: it employs more than one non-resident on the premises, has outdoor storage of materials or equipment, has outdoor parking of more than one commercial vehicle exceeding 10,000 pounds gross vehicle weight, occupies more than 25 percent of the floor area of the dwelling, occupies more than 500 square feet of floor space in accessory buildings, will routinely serve more than three (3) customers or clients on the premises at any one time, or is potentially disruptive, offensive or harmful to the neighborhood.

A Major Home Occupation (MHO) by-law can regulate: utility areas, the number of employees, parking, signage, lighting, the level of retail activities. The MHO can require business owners to be the homeowner, and ensure that activities are to be non-injurious to the public or natural environment, any abutter, or the neighborhood as a whole.

- **The Conservation Commission adopts amendments to the local wetlands protection by-laws and regulations that would specifically prohibit the storing outside of more than two, non-registered vehicles.** These regulations could apply to all areas of town based on the understanding that most residents

receive their drinking water from bedrock wells that are vulnerable to contamination from pollutants in groundwater. Regulations on hazardous material storage and use could also be specified for areas that overlay known and estimated aquifers. Special permits and exceptions could be provided for certain uses such as truck farming operations and other businesses developed under the Major Home Occupation By-law.

- **The Town direct its Conservation Commission and Recreation and Open Space Committee to adopt a more aggressive and comprehensive approach to the use of land protection as a growth management tool.** The town will have future opportunities to protect, in perpetuity, public access to deep woodlands and forest trails that residents enjoy without allowing overuse by motorized vehicles that diminish the peace and quiet. Many of the large blocks of unprotected contiguous forests in Shutesbury, north and south of Leverett Road are in the Chapter 61 program. The town will continue to have opportunities to acquire or otherwise protect forestlands through executing its right-of-first-refusal option. The ability of the community to protect valuable forestland may be dependent on residents' continued awareness of the myriad of forest values sustained in Shutesbury via land protection. The relevant town committees and others may seek to raise money in preparation of future opportunities. The town may also want to study the feasibility of borrowing funds to purchase land to keep it out of development. For example, the Town of Walpole, Massachusetts is a bedroom community of 20,000+ with several large commercial and industrial properties, located nineteen miles southwest of Boston. In December 1998, Walpole borrowed \$7.7 million to purchase 293 acres of private forests and fields to keep 163 big (4-bedroom) single-family homes from being built there (David Davison, Director of Finance, Town of Walpole; 2000). The Town of Shutesbury has had a similar, albeit less expensive, opportunity recently with the South Brook Conservation Area, and surely will have these types of opportunities in the future. Like Walpole, Shutesbury may find that it makes more sense to borrow a considerable sum of money to purchase open space than to pay for the annual municipal services that population increases can produce. Shutesbury could pass the Community Preservation Act and leverage state funds against local monies raised to protect open space, preserve historical uses, and develop affordable housing.
- **The Shutesbury Select Board appoints a Senior Housing Subcommittee to plan for the development of senior housing in the Town Center, in the vicinity of the new library, near Amherst, near Lake Wyola, or other suitable locations.** The Select Board could appoint a Senior Housing Subcommittee to study the most appropriate locations for affordable senior housing. Although the Census information does not point to a critical need today, in ten years the over 65 years age group is projected to increase from 104 to 127, and by 2020, to 208, double the number of seniors in the year 2000. It can take several years to develop senior housing and it may be worthwhile to begin the process with a survey of people sixty years and over as to their interest in housing that could be

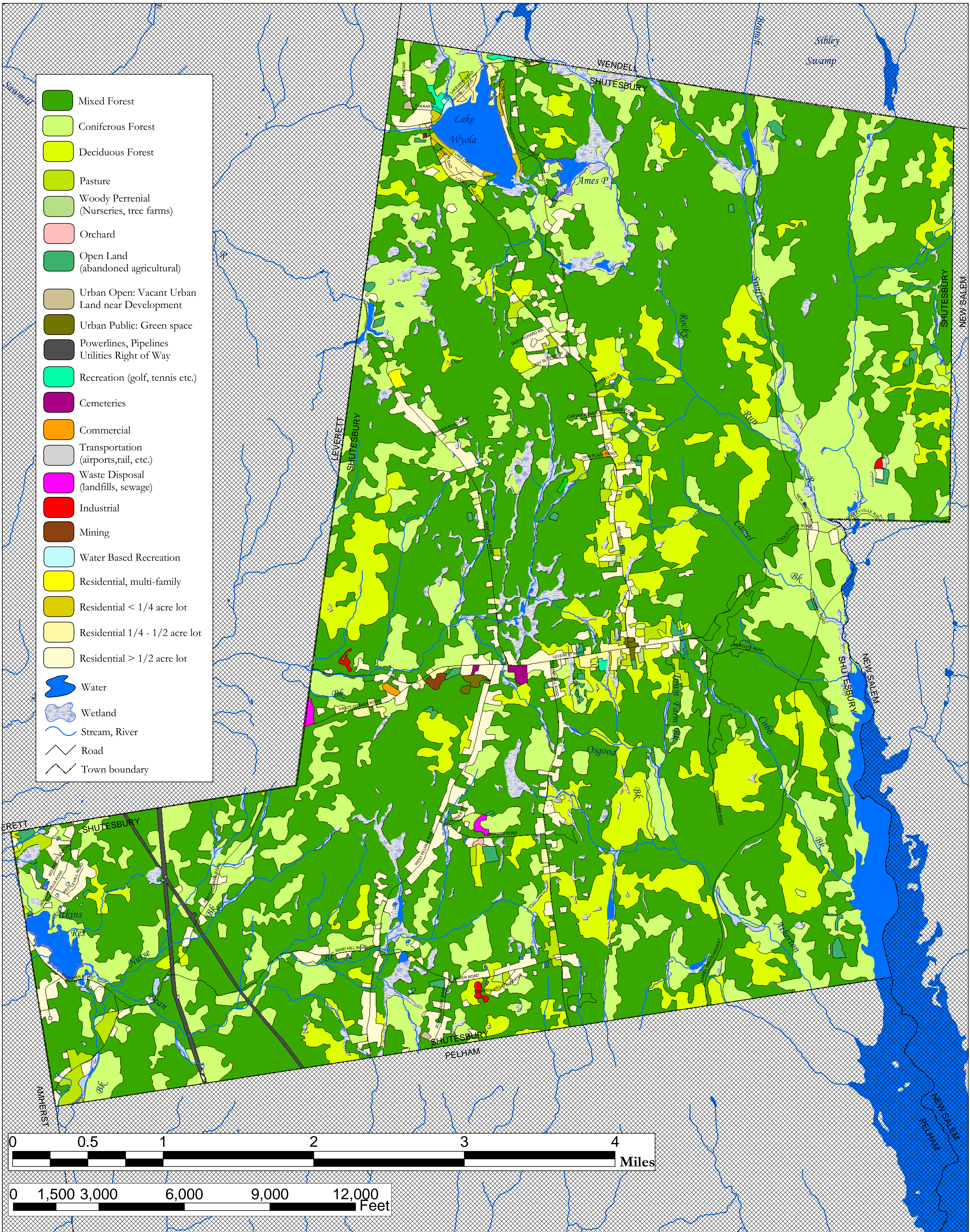
developed in close proximity to the new library or to Lake Wyola. In the case of Lake Wyola, the town might consider using some of the town-owned land for the development of scale-appropriate senior housing that could then be developed and managed by the Franklin Regional Housing and Redevelopment Authority. Senior housing, if privately-owned, could contribute tax revenues to pay for municipal services without contributing to education-related expenses.

- **The Planning Board should develop a Fence By-law to protect scenic road-side views and the pastoral nature of our country roads.** Fences in the front setback area should be a maximum of forty-eight inches by right. Taller fences may be approved by Special Permit. In addition to blocking scenic and natural landscapes, tall fences sometimes create a road visibility hazard and should have review by the Zoning Board.
- **The Town adopts the Community Preservation Act.** The Community Preservation Act is statewide enabling legislation that allows cities and towns to raise funds for open space protection, historic preservation, and affordable housing by adopting up to a 3 percent surcharge of the real estate tax levy. Monies raised via the surcharge would also receive a state match.

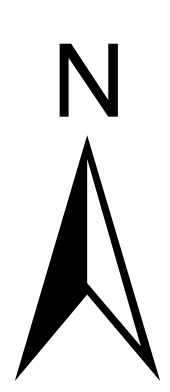
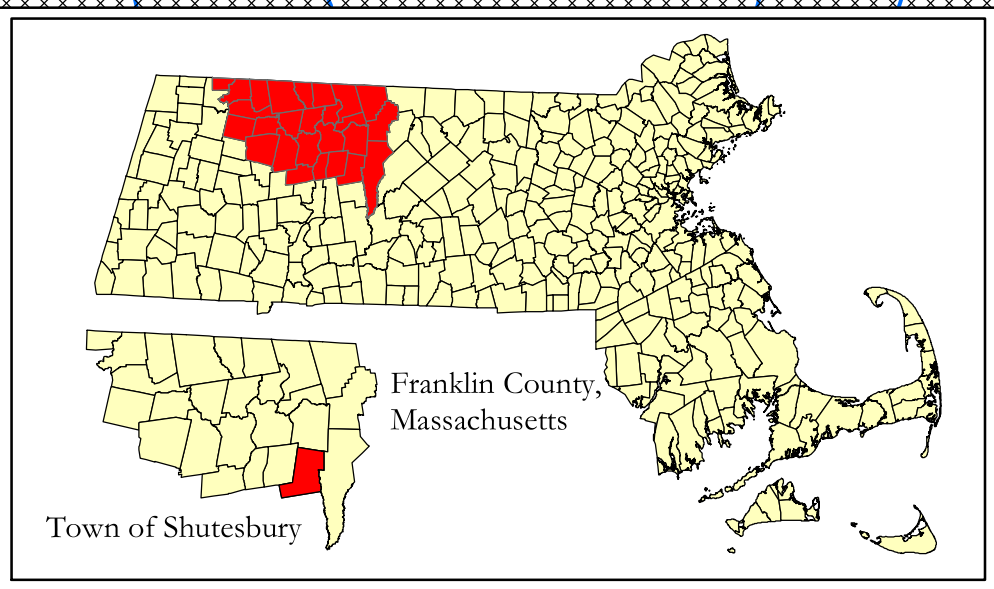
Town of Shutesbury

Master Plan

Land Use



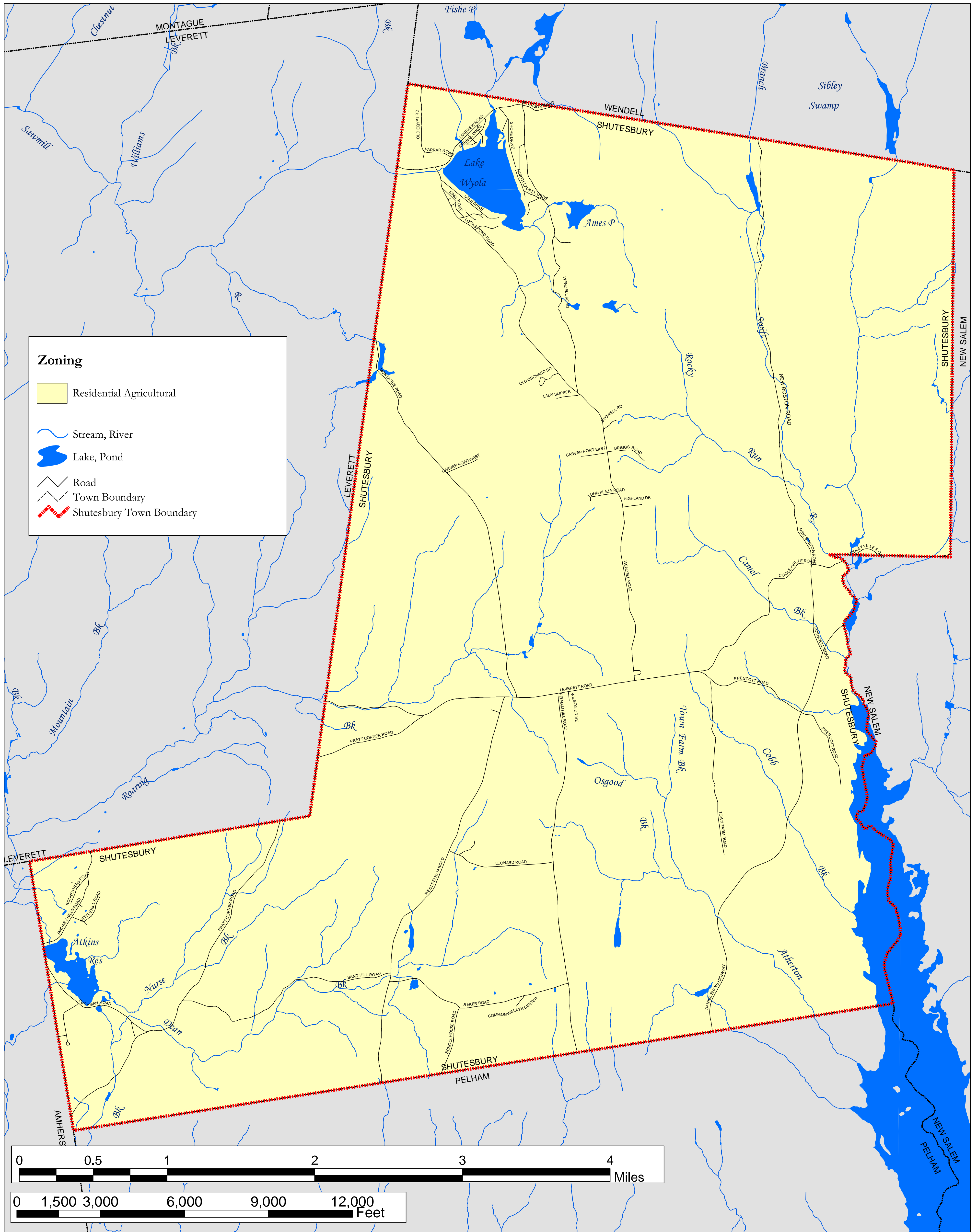
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Map Sources:
 Map Produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, the Massachusetts Highway Department and MassGIS. Digital Data obtained from MassGIS represents the efforts of the Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. EDEA maintains an ongoing program to record and correct errors in the GIS data that are brought to or as to the implied validity of any uses of the GIS data. EDEA maintains records regarding all methods used to collect and process these digital data and will provide this information on request. Executive Office of Affairs, MassGIS EDEA Data Center, 251 Causeway St., Suite 900, Boston, MA, 017-626-1000.
 Note: Depicted boundaries are approximate and are intended for planning purposes only.
 Land use provided by Town of Shutesbury and MassGIS 1999 MacCorrel Land Use created by Resource Mapping, Forestry and Wildlife Department, UMMS, Amherst under contract of FRCOG Planning Department. Land use change coverage only signifies polygons that have changed from 1971 - 1999 but do not show what the polygons original use was. This was created by FRCOG planning dept from land use history table. Road data provided by Massachusetts Highway Department. Town Line, stream and lake data provided by MassGIS. Shutesbury wetlands are provided by the National Wetlands Inventory data from US Fish and Wildlife Service and MassGIS 1:5000 orthophoto depiction.

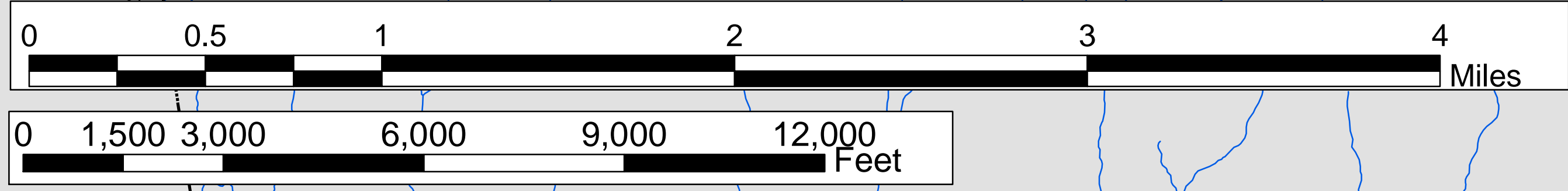
Town of Shutesbury Master Plan

Current Zoning

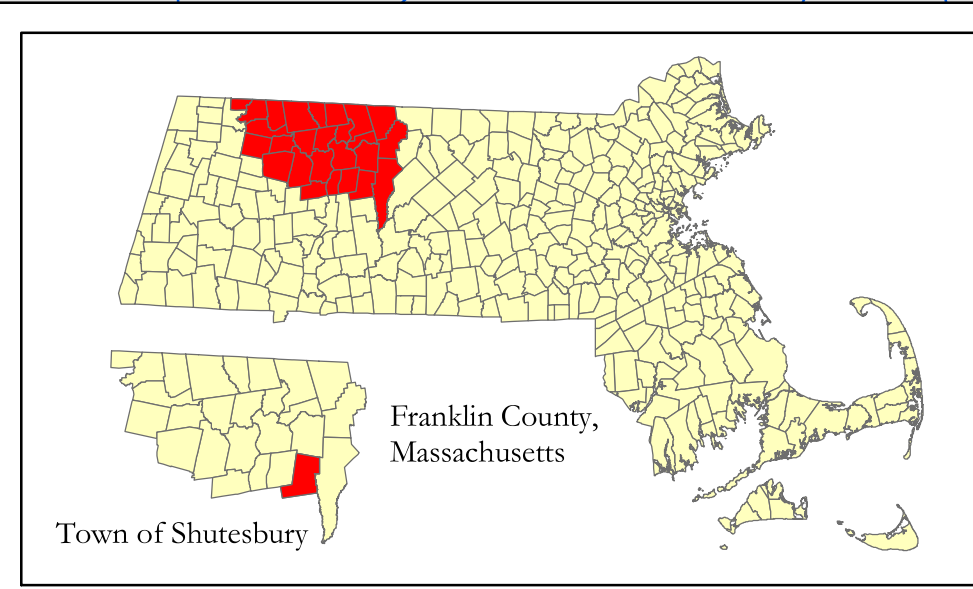


Zoning

- Residential Agricultural
- Stream, River
- Lake, Pond
- Road
- Town Boundary
- Shutesbury Town Boundary




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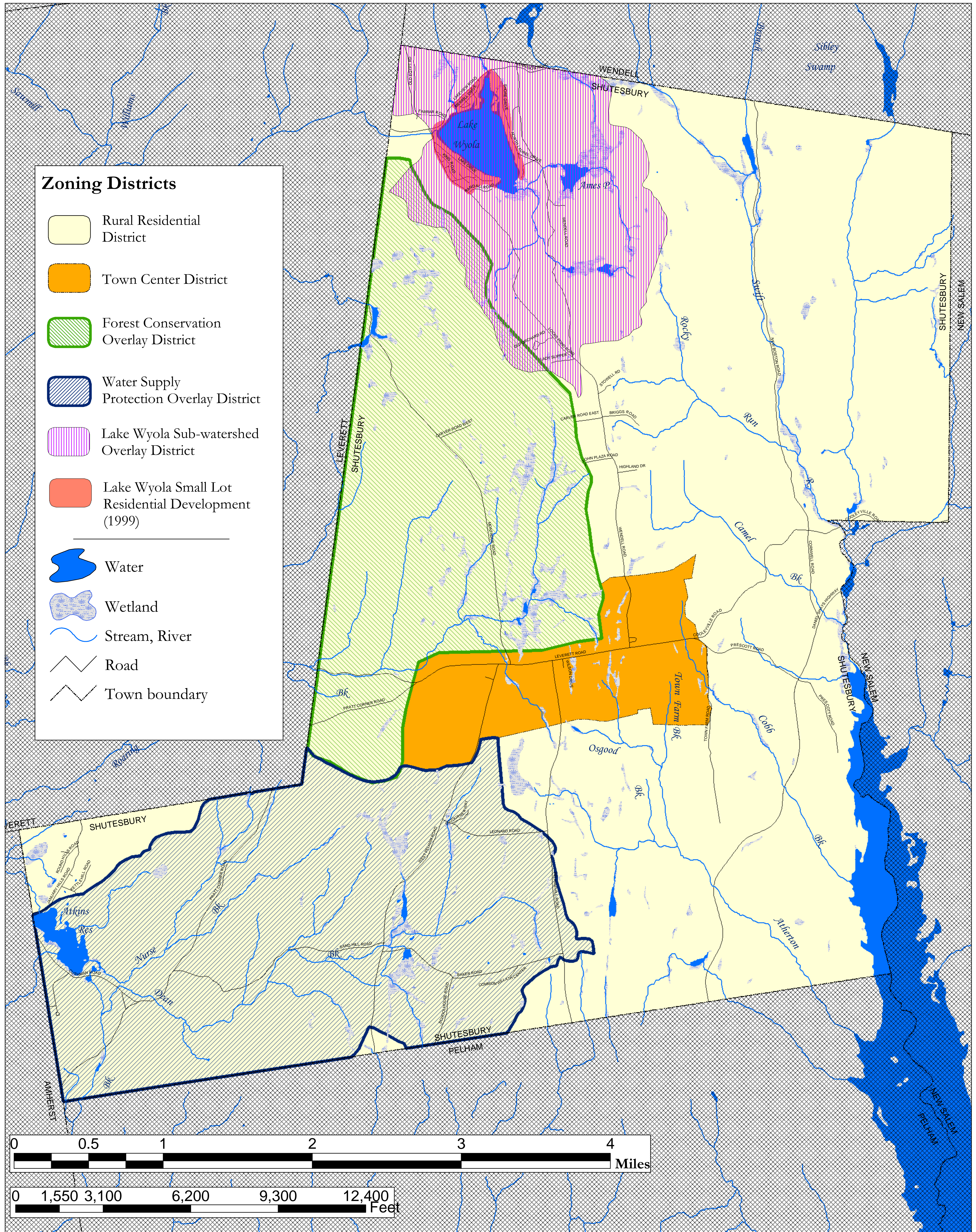
Note: Depicted boundaries are approximate and are intended for planning purposes only.

Roads data provided by Massachusetts Highway Department and MassGIS 1:5000. Town Lines, streams and lakes data provided by MassGIS. Zoning provided by MassGIS.

map composed by Ryan Clary FRCOG Planning Dept.
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Town of Shutesbury Master Plan

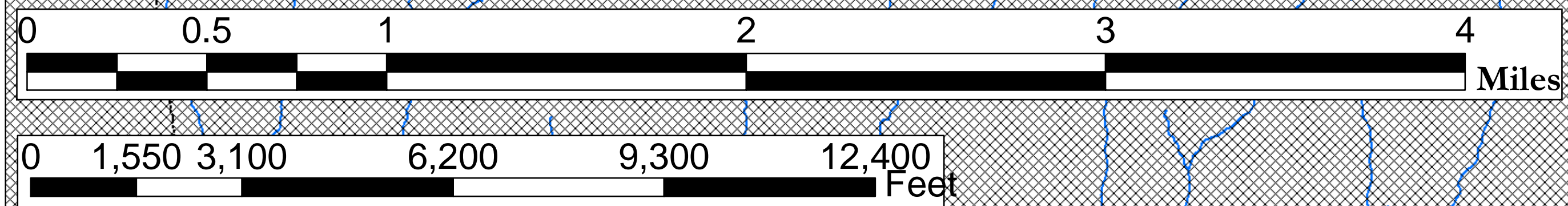
Potential Zoning Map



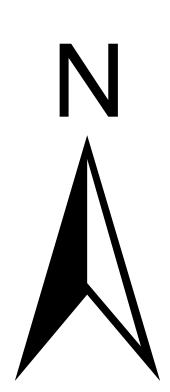
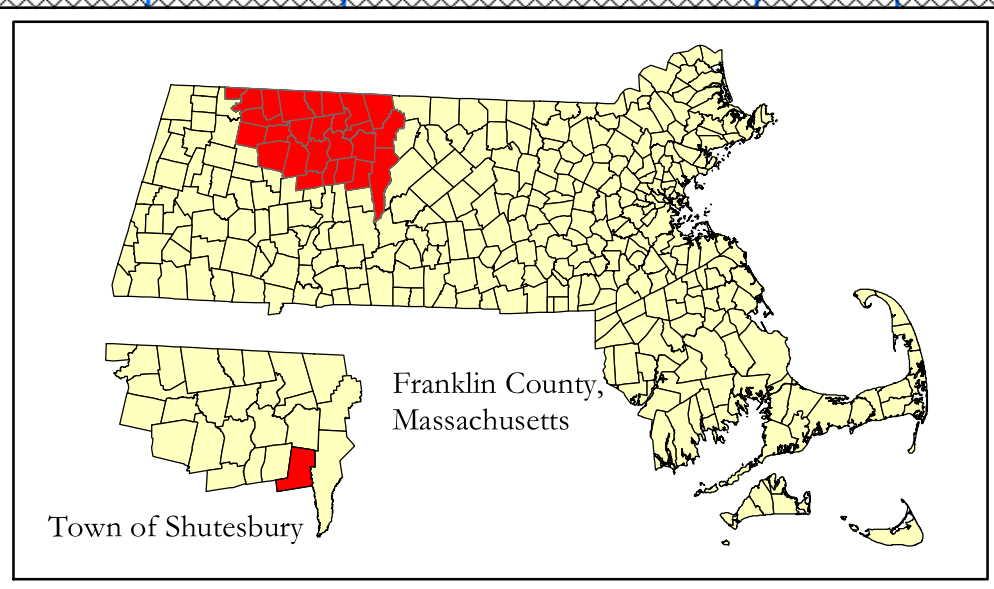
Zoning Districts

- Rural Residential District
- Town Center District
- Forest Conservation Overlay District
- Water Supply Protection Overlay District
- Lake Wyola Sub-watershed Overlay District
- Lake Wyola Small Lot Residential Development (1999)

- Water
- Wetland
- Stream, River
- Road
- Town boundary



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Map Sources:
Map Produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, the Massachusetts Highway Department, MassGIS and the town of Shutesbury.
Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. EOEAA maintains an ongoing program to record and correct errors in the GIS data that are brought to or as to the implied validity of any uses of the GIS data. EOEAA maintains records regarding all methods used to collect and process these data and will provide this information on request. Executive Office of Environmental Affairs, MassGIS EOEA Data Center, 30 Somerset Street, 3rd Floor, Boston, MA, 01727-5227.
Note: Dotted boundaries are approximate and are intended for planning purposes only.

Roads data provided by Massachusetts Highway Department and MassGIS 1:5000. Town Lines, Streams and Lakes data provided by MassGIS. Potential zoning created by Franklin Regional Council of Governments Planning Department.

APPENDIX A
EXECUTIVE SUMMARY

Shutesbury Town Plan Goals & Objectives

The Goals and Objectives within this document are initial findings based on Shutesbury's 2001 Town Plan survey. The Goals and Objectives have been further revised based on input from town boards and committees, and public input from four listening sessions. They provide the basis for the subsequent development of a Town Plan.

Prepared for the Town of Shutesbury

**Preliminary Draft
Submitted
June 25, 2001**

**Draft
Submitted on
December 21, 2001**

**Revised and Approved by the Town Plan Committee
16 January 2002**

Prepared by

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Planning Department

The preparation of Shutesbury's Preliminary Draft Goals and Objectives was funded by the Massachusetts Department of Housing and Community Development (DHCD) through the Peer-to-Peer Program

Goals and Objectives with the designation of "High" were considered by the Town Plan Committee to be of higher importance and priority than others listed.

Natural Resources and Open Space

Results of the recent survey demonstrate that Shutesbury residents understand the relationship between the quality of the environment and their own lives, and the need to actively protect air and water quality, farm and forestlands, wetlands and vernal pools.

Goals:

A. To maintain and protect natural resources including clean drinking water supplies, clean air, lake and stream water quality, large forested areas, open fields, wildlife and their habitat areas, and wetlands including vernal pools. *High*

B. To preserve the rural character by protecting large blocks of contiguous forestland, fields, and other open space from development and by promoting sustainable forestry, agricultural, and other resource-based activities. *High*

Objectives:

1. Identify and protect potential aquifers and recharge areas for public drinking water supplies and protect private well water quality. ***High***
2. Monitor water quality in the rivers, streams, lakes and ponds and develop methods for their protection and improvement where appropriate. ***High***
3. Develop strategies to increase funding and awareness (and establish a separate, interest bearing account for such funds) for open space protection, management, and acquisition, such as, but not limited to: ***High***
 - Land bank
 - Earmark a percentage of current town revenue from Ch. 61 stumpage monies
 - Management of town-owned lands for income
 - Payments in Lieu of Taxes from Department of Environmental Management, Metropolitan District Commission, and Town of Amherst.
 - Raffles, auctions, sponsored mountain bike/ski/walkathon on trails, and /or fund drives.
4. Apply identified criteria/priorities of open space acquisition/protection (i.e., below from current Open Space and Recreation Plan) to opportunities that may arise, especially via Chapter 61 right-of-first-refusal, so as to provide the town a rating of the parcel's relative desirability of protection. ***High***
 - Open fields and non-forested lands
 - Important water features including falls, springs, and distinctive or unique wetlands

- Rare species habitat (state-listed rare, threatened and endangered) and vernal pools
 - Areas of high visual or aesthetic value
 - Recreational access and lake, stream and trail node access
 - Unique or distinctive historic, archaeological or geological features
 - Threat of development
 - Areas that connect or enlarge protected areas and or create conservation corridors
5. As an added safeguard, establish a protocol for the potential transfer of the Town's right-of-first refusal to a local conservation land trust so that high priority Chapter 61 open space, under threat of development, may be protected. **High**
 6. Identify the most important scenic and recreational areas in town and seek to purchase or otherwise acquire scenic easements (legal documents that represent the transference of ownership rights between parties) from willing landowners to help protect these views from development and/or change. **High**
 7. Designate Local Scenic Roads to help protect roadside trees, which contribute greatly to Shutesbury's rural character. **High**
 8. Develop and adopt an enhanced local wetlands protection by-law. **High**
 9. Support and promote private initiatives to protect open space, natural resources, and forestland including the use of Conservation Restrictions. **High**
 10. Actively pursue gifts and bequests of open space lands and Conservation Restrictions. **High**
 11. Consider establishing a rural conservation overlay district, which would have conservation development design as the preferred development option. **High**
 12. Adopt zoning and subdivision control measures, which will ensure that new residential development occurs at a density appropriate for a rural town. **High**
 13. Coordinate the activities of the Shutesbury Conservation Commission and the Recreation Committee to plan, develop, and maintain trail linkages over land and water to enhance the recreational experiences of residents participating in the most popular outdoor activities: walking, hiking, bird watching, bicycling, X-country skiing, canoeing/kayaking/rowing, mountain biking, snow shoeing,

- running, and snowmobiling. In addition, resolve any use conflicts between motorized and non-motorized users. **High**
14. Proactively seek private owners of significant parcels (i.e., those who own 50 or more acres) and offer such information (previous objective); also, annually thank them for their personal contribution to rural character and outdoor recreation. **High**
 15. Maintain a current open space map of protected parcels and unprotected parcels, to facilitate decision-making about acquisition or other protection actions. **High**
 16. Ensure that open space lands are not taxed as developable if they do not have developable lots based on zoning. **High**
 17. Promote through the use of incentives protection, enhancement, management, and maintenance of open fields for scenic and wildlife habitat purposes. **High**
 18. Research the need for establishing a policy, which would regulate the number of automobiles that may be legally stored on one's property.
 19. Work with other local boards (e.g., planning, conservation commission, zoning board of appeals, recreation commission, assessor, health) and regional, non-profit, and state agencies regarding open space and protection issues and environmental quality concerns including public drinking water.
 20. Provide information and educational opportunities to landowners about: Chapter 61, Conservation Restrictions, and estate planning that incorporates land protection. Facilitate land protection with local land trusts and state agencies.
 21. Support homeowners to maintain open fields and pasture.
 22. Help protect wetlands by adopting an upland requirement of seventy-five percent (75%) for all building lots.
 23. Research the feasibility of creating and maintaining, where appropriate, historic long-range views.
 24. Identify and protect important ridgelines and view sheds. Implement measures to direct telecommunications towers away from highly visible ridges in town.
 25. Develop and implement an active open space program so that residents and landowners may donate land for the community's enjoyment and long-term stewardship.

26. Pursue grants and other forms of technical assistance for forest landowners and agricultural businesses to improve the financial viability of their operations.

Housing

The types and densities of residential development were topics addressed in the recent survey. Housing for single-family and two-family homebuyers as well as the elderly, appears to be supported but with restrictions. Survey respondents support single-family homes on lots 2 acres in size or larger and two-family homes on 3 acres or larger. Elderly housing that provides property tax revenues appears also to be supported. Finally, the community survey respondents appear to support conservation development and restricting growth in already densely developed areas.

Goals:

A. To encourage a mix of housing densities, ownership patterns, prices, and building types to serve diverse households consistent with the rural character of the community. *High*

B. To provide fair, decent, safe, affordable elderly housing that meets the needs of Shutesbury's seniors and which also contributes to the tax base. *High*

C. To provide financial assistance to homeowners for state regulations and encourage compliance with Board of Health Code with respect to Title 5, removal of lead paint etc.

Objectives:

1. Determine the most appropriate mix and location of development densities in Town for single, two-family, and elderly housing. ***High***
2. Identify zoning and subdivision measures that have succeeded in encouraging developers to choose cluster developments, which promote the retention of open space, over conventional subdivisions. ***High***
3. Support state-sponsored programs that provide financial assistance for homeowners to comply with Title 5 septic system and lead paint removal regulations.
4. Work with the Franklin County Housing and Redevelopment Authority, and non-profit agencies to help homeowners obtain access to financial assistance for septic upgrades and home improvement financing.

5. Pursue public grants with the assistance of the Franklin County Housing and Redevelopment Authority (FCHRA) and other sources of funding to enhance the financial feasibility of affordable elderly housing development, both rental and owner occupied, whether the units are owned by the Town, the FCHRA, or by a private entity.

Community Services

The Town of Shutesbury provides its residents with a host of services including elementary school education, police and fire protection, ambulance service, the public library, highway maintenance, solid and hazardous waste management, and recreational facilities. Community survey respondents appear to support increased spending backed by a willingness to pay through property taxes for the following services: ambulance, open space acquisition, care of conservation land, a new or expanded library, an expanded school curricula, and increased road maintenance. It will be important to determine which services have the necessary political support to receive funding for expansion.

Goal:

A. To continue to provide excellent police, fire, and ambulance service; solid and hazardous waste management; highway maintenance; library and recreational facilities; and elementary school education services. *High*

B. To plan and coordinate the provision of community facilities and services in an appropriate and cost efficient manner, which may include the development of a capital improvement plan. *High*

Objectives:

1. Explore the short and long-term programming and funding needs of the Shutesbury Police and Fire Departments to support their continued level of service. ***High***
2. Develop new, and expand existing, multiple-user recreational trails connecting Shutesbury's open space, natural, and historic resources. ***High***
3. Encourage the adoption of best management practices in all Town departments, especially for the use of road sand and salt by the highway department. ***High***
4. Determine the most cost efficient ways to upgrade the ambulance service to Shutesbury. ***High***

5. Identify the level of road maintenance sought by Shutesbury residents and ensure that any roadway upgrades balance safety considerations with neighboring rural character and town-wide network needs. **High**
6. Determine the feasibility of acquiring more Town-owned land for the purposes of expanding existing community facilities like the school, library, Town Hall and police and fire buildings and for the development of potential future needs such as sports fields, wastewater treatment and drinking water filtration plants. **High**
7. Identify and address the long-term needs of the Highway Department including facilities and space. **High**
8. Improve communication between all Town boards and between the Town and residents. Consider development of a new and improved web site, a communications committee, and a decision-making protocol that involves board and commission interaction for efficient management of information, time, and money. Explore the feasibility of an extended capital improvement planning process as a means for increasing inter-board communication. **High**
9. Pursue state financial assistance to identify potential future ground water supplies and Zone II recharge areas (the land surrounding a groundwater supply, which represents the biggest area that contributes water during an extended dry period without precipitation), as well as technical assistance to develop resource protection strategies. **High**
10. Increase participation among Shutesbury residents in recycling, home composting, and hazardous material drop-off programs.
11. Expand the library services in such a way as to ensure the enjoyment of all.
12. Determine the short and long-term space, programming, and funding needs of the Shutesbury Elementary School to support their continued level of service.
13. Explore ways of expanding the Elementary School curricula in a cost efficient manner.
14. Encourage the Recreation Committee or another organization to coordinate the production of community events that are family-oriented including concerts, holiday events, community fairs, nature outings, summer recreation programs for youth, and arts festivals. Create ways for utilizing the following as sites for these activities: Town Common, Elementary School, Town Hall, Old Town Hall, and Library. Consider alternatives to these sites as well including Temenos, the Shutesbury Athletic Club, Morse Hill and Sirius.
15. Assess recreational programming and facilities needs for families, teens, children, and elders and develop a plan for their implementation.

16. Develop recreational and other programs that will reduce the necessity for Shutesbury residents to leave town to obtain these services
17. Explore the feasibility of developing a community center in Town as a means of providing recreational, educational, and social services for all aged residents but especially the very young, adolescents, and seniors.
18. Publicize family-oriented programs and facilities in place for use by residents.
19. Address safety, maintenance, and operations issues for all recreational sites.
20. Notify the Department of Environmental Protection (DEP) of all new public water suppliers to monitor water quality for public safety.
21. Establish leak detection and repair programs as needed and remove underground storage tanks over 20 years old.
22. Identify and map locations of private wells to prevent contamination from road salt, herbicides and other contaminants by limiting applications near those areas.
23. Boards of Health may encourage the use of alternative septic systems in situations where enhanced wastewater treatment is needed to protect ground water supplies.

Historic and Scenic Resources

Survey respondents felt that it was important to preserve Shutesbury's rural character, historic buildings, and landscapes. Based on the survey results, respondents consider the contributing factors to the Town's rural character to include: open fields, scenic views, historic stone walls and foundation holes, large road-side trees, historic structures, farm houses, narrow winding roads, and dirt roads. Often the region's most scenic and traditional working landscape patterns are maintained by ongoing agricultural activities (including forest management). These landscapes are often viewed and appreciated from our main roadways. Historical landscapes can encompass historical structures associated with agriculture, vegetation molded by farming and forest management, protected open space, scenic view sheds, and locally designated scenic roads.

Goal:

A. To identify and protect historic and scenic resources including buildings, sites, and landscapes. *High*

Objectives:

1. Review the existing Massachusetts Historical Commission forms and the updated Shutesbury Historic Commission inventory to determine if any actions are still needed to create a complete and accurate inventory of all historic buildings, sites, foundation holes, important stonewalls, and landscapes. **High**
2. Consider adopting steps such as implementing a demolition delay bylaw to support the protection of significant historic structures in Town. **High**
3. Identify and pursue federal and state grants in support of historic resource protection especially for the old Town Hall. **High**
4. Identify, document, and protect significant historic and scenic landscapes, especially remaining agricultural and community development landscapes. **High**
5. Develop a policy for use of the Town Common, Spear Memorial Library, and the old Town Hall, which respects the traditional uses of these buildings while at the same time, provides access to all town residents to this popular community resource. **High**
6. Adopt local scenic road designation for Shutesbury's most scenic roads. **High**
7. Explore the feasibility of National Historic District designation for the Shutesbury Town Common.

Transportation

Survey respondents felt that transportation issues including pedestrian access, road maintenance, safety, and public transportation were very important. These are reflected in the goals and objectives below.

Goals:

- A. To maintain the condition of the road system in a manner that is compatible with Shutesbury's rural character. *High***
- B. To maintain the pedestrian infrastructure.**
- C. To maintain traffic patterns at key locations.**
- D. To expand transportation choices for Shutesbury residents.**

Objectives:

1. Consider developing rural road design guidelines, where possible, to maintain the rural appearance of Shutesbury's road network. **High**
2. Improve access to existing walking/bike/running paths in Shutesbury. **High**
3. Address parking and circulation issues around the Town Common. **High**
4. Explore the development of local bus service to Amherst, Northampton, and Greenfield. Consider the need for parking, which would be associated with a park and ride facility.
5. Make ride-share information more accessible to Shutesbury residents.
6. Design and implement pedestrian safety improvements around the Town Common.

Economic Development

In the community survey, respondents identified the most popular forms of economic development. They included home businesses, arts and crafts, bed & breakfasts, dentists/doctors/veterinarian, restaurant/coffee shop, crop/truck farming, gas station/convenience store, very small manufacturing (≤ 5 employees), and software development (≤ 25 employees). Understanding the potential direct and indirect impacts different types of economic development can have on traffic, environmental quality, residential development, and the tax base is one of the first steps in determining the most appropriate strategies for economic development in Shutesbury.

Goal:

A. To explore and potentially promote small home business and commercial uses including arts and crafts, bed & breakfasts, professional offices and services, retail, forest/farm-based operations and light industrial development compatible with Shutesbury's environment and rural character that will provide new employment opportunities and contribute tax revenues. **High**

Objectives

1. Encourage, through zoning, the development of local businesses which can be integrated into the community without adverse environmental impacts including forestry, specialty food products, aquaculture, nurseries, home based businesses, a coffee shop/eatery, artisans, and professional offices. **High**

2. Explore the feasibility of locating light industrial development and associated infrastructure including wastewater treatment in a suitable location and determine if the current zoning is compatible with the protection of environmental and scenic resources. **High**
3. Participate with regional efforts like Franklin-Hampshire Connect to help ensure Shutesbury residents and small business owners can have access to high-speed Internet connections. **High**
4. Explore the feasibility and desirability of working with a developer of retirement communities to establish a privately owned facility in Shutesbury as a means of generating real estate tax revenues. **High**
5. Determine if alternative power sources could be established on Town land and provide energy to the grid and revenues to the Town.
6. Explore the feasibility of developing a Town- or privately-owned spring water bottling facility in Shutesbury for tax relief.

Land Use and Zoning

Survey respondents have issued a dual mandate to protect rural character, open space, and the environment and at the same time expand community facilities and services and explore economic development. Improving the Town in these ways may make the community more attractive to prospective homebuyers and result in increased demand for housing sites in Shutesbury. Finding appropriate solutions to these land use issues will be one of the main results of the Town Planning process.

It is premature to identify objectives at this stage in the planning process. The Town Planning Committee will most likely generate recommendations for each Chapter of the Plan after reaching consensus on the completeness of the inventory, analysis, and issues descriptions. Each Chapter's recommendations may include both zoning and non-zoning techniques and strategies. The Land Use & Zoning Chapter's objectives should reflect and incorporate the Chapters' recommendations. Finally, the Land Use & Zoning recommendations may reflect one of the most important ways for implementing the Town Plan: direct zoning revisions.

Goals

A. To protect the rural character and working landscapes of Shutesbury, while allowing landowners to develop suitable portions of their land. *High*

B. To protect the Town's natural resources and open space through appropriate zoning and subdivision measures. *High*

C. To encourage small business development in a manner that does not reduce residents' quality of life. *High*

D. To develop a system of land-use controls, which will best manage the acceptance of new development in the community. *High*

E. To design potential future development so that traffic patterns remain light near residential areas and that public safety related concerns remain a priority.

Objectives: To be determined.

PLANNING FOR SHUTESBURY'S FUTURE: BEGINNING THE MASTER PLAN

Dear Shutesbury resident:

Thank you for taking the time to complete this survey. It has been designed to determine what citizens want for **the future of Shutesbury**. The Shutesbury Master Plan Committee would like to create a comprehensive Master Plan for the Town. A Master Plan is a long range plan that guides development in the Town towards a vision of what residents would like the future to be. It is also a comprehensive plan that looks at all aspects of the community. Most of all, it is a plan that is created by and for the citizens of Shutesbury. This is your first opportunity to take part in the creation of the Master Plan. The results of this survey will be used to create Goals and Objectives, which will provide a framework for the Master Plan. Your answers will remain anonymous. Thank you for your help.

If you, or any family members would like additional copies of the survey, they are available at the Library and at the Post Office.

Please return the survey in the pre-stamped envelope by _____ to the Shutesbury Master Plan Committee or see the back cover of this survey for additional return options.

Your opinion is important and your participation in this process is greatly appreciated!

Chair, Master Plan Committee

Chair, Board of Selectmen

WHY DO YOU LIKE LIVING HERE?

This set of questions deals with the quality of life in Shutesbury.

Q1. How important was each of the following in your decision to move to Shutesbury? Please circle a number for each item where 1 = Very Important; 2 = Important; and 3 = Not Important. If you were born in Shutesbury, please skip to Q2.

		Very Important	Important	Not Important
a.	Rural or small town character	1	2	3
b.	Open fields, forests, trails	1	2	3
c.	Peace and quiet	1	2	3
d.	Access to Lake Wyola	1	2	3
e.	Proximity to the Quabbin	1	2	3
f.	Air/water quality	1	2	3
g.	Public services	1	2	3
h.	Local climate	1	2	3
i.	Safety from crime and vandalism	1	2	3
j.	Public school system	1	2	3
k.	Affordable housing	1	2	3
l.	Recreational opportunities	1	2	3
m.	Friends or relatives here	1	2	3
n.	Access to Sirius or Temenos	1	2	3
o.	Five-college area	1	2	3
p.	Easy commuting	1	2	3
q.	Job opportunities in the region	1	2	3
r.	Ability to be involved in Town government	1	2	3
s.	Other (please list) _____	1	2	3
t.	_____	1	2	3
u.	_____	1	2	3

Q2. How important is each of the following to your satisfaction with living in Shutesbury? Please circle a number for each item where 1 = Very Important; 2 = Important; and 3 = Not Important.

		Very Important	Important	Not Important
a.	Rural or small town character	1	2	3
b.	Open fields, forests, trails	1	2	3
c.	Peace and quiet	1	2	3
d.	Access to Lake Wyola	1	2	3
e.	Proximity to the Quabbin	1	2	3
f.	Air/water quality	1	2	3
g.	Public services	1	2	3
h.	Local climate	1	2	3
i.	Safety from crime and vandalism	1	2	3
j.	Public school system	1	2	3
k.	Affordable housing	1	2	3
l.	Recreational opportunities	1	2	3
m.	Friends or relatives here	1	2	3
n.	Access to Sirius or Temenos	1	2	3
o.	Five-college area	1	2	3
p.	Easy commuting	1	2	3
q.	Job opportunities in the region	1	2	3
r.	Ability to be involved in Town government	1	2	3
s.	Other (please list) _____	1	2	3
t.	_____	1	2	3
u.	_____	1	2	3

Q3. Do you expect to leave Shutesbury within the next five years?

___ Yes ___ No

Q4. If yes, why? *If you answered no to Q3, please skip to Q5.*

NATURAL RESOURCES

The next few questions ask your opinion about Shutesbury's natural resources.

Q5. How important is it to conserve the following natural resources and scenic resources? *Please circle a number for each item where 1 = Very Important; 2 = Important; and 3 = Not Important.*

		Very Important	Important	Not Important
a.	Dirt roads	1	2	3
b.	Forests	1	2	3
c.	Open fields	1	2	3
d.	Rural character	1	2	3
e.	Scenic views	1	2	3
f.	Stone walls	1	2	3
g.	Lakes and streams	1	2	3
h.	Wetlands	1	2	3
i.	Wildlife habitat	1	2	3
j.	Clean drinking water	1	2	3
k.	Clean air	1	2	3

Q6. Which actions do you support to protect/conservate open space and natural resources? *Please circle a number for each item where 1 = Strongly Support; 2 = Support; and 3 = Don't Support.*

		Strongly Support	Support	Don't Support
a.	Town purchase of conservation land	1	2	3
b.	Town purchase of development rights	1	2	3
c.	Zoning changes for open space protection/conservation	1	2	3
d.	No additional Town actions should be taken	1	2	3
e.	Acceptance of conservation land	1	2	3
f.	Acceptance of development rights	1	2	3

Q7. Please refer to the Town map below. What part of Town do you live in? Please place an "X" on the map in the approximate location of your house/apartment? Please refer to the table below the map. What types of recreation do you participate in? Please place a check mark in the box to the right of any activity listed that you participate in. Then for each one that you participate in, tell us where you do this activity in Shutesbury, and let us know if you have any comments about the resources in Town that support that activity.

	Activity	Where do you do the activity?	Comments
a.	Bicycling		
	Mountain biking		
b.	Bird watching		
c.	Canoeing/kayaking/rowing		
d.	Fishing		
e.	Hiking		
f.	Horse riding		
g.	Hunting		
h.	Motorboating/water skiing		
i.	Sailing		
j.	Snowmobiling		
k.	Swimming		
l.	Walking		
m.	X-country skiing		
n.	Rollerblading/skateboarding		
o.	Use of mototrized off-road vehicles		
p.	Dancing		
q.	Field/organized sports		
	Other (please list below)		
r.			
s.			
t.			
u.			

Q8. What does rural character mean to you? Please circle a number for each item where 1 = Very Important; 2 = Important; and 3 = Not Important. For example, if you feel that an item listed is a necessary component of rural character, you would circle either 1 or 2, depending on how strongly you felt about it.

		Very Important	Important	Not Important
a.	Large road side trees	1	2	3
b.	Dirt roads	1	2	3
c.	Historic stone walls and foundation holes	1	2	3
d.	Historic structures	1	2	3
e.	Vernal Pools	1	2	3
f.	Lake Wyolaq	1	2	3
g.	Moose, bear, bobcat, fox, and other wild animals	1	2	3
h.	Open fields	1	2	3
i.	Farm houses	1	2	3
j.	Scenic views	1	2	3
k.	Narrow windy roads	1	2	3
l.	Large forested areas	1	2	3
m.	Walking and hiking trails	1	2	3
n.	Low traffic volume/slow speeds	1	2	3
o.	Farm animals	1	2	3
p.	Quiet	1	2	3
q.	Lower housing density	1	2	3
r.	Absence of city lights	1	2	3
s.	Babbling brooks	1	2	3
	Other (Please list)	1	2	3
t.		1	2	3
u.		1	2	3
v.		1	2	3

HOUSING

The following questions ask you to identify your position on various housing issues.

Q9. What types of future residential development would you favor for Shelburne? Please circle a number for each item where 1 = Favor; 2 = Oppose; and 3 = Unsure.

		Favor	Oppose	Unsure
a.	Single family residential: 2 acre or larger lots	1	2	3
b.	Duplex (Two-family) residential: 3 acre or larger lots	1	2	3
c.	Apartments	1	2	3
d.	Condominiums	1	2	3
e.	Conversion of single family housing to multi-family units	1	2	3
f.	Cluster residential: development of houses in clusters on a small part of the property so that the remaining land is protected as open space	1	2	3
g.	Other (please list) _____	1	2	3
h.	_____	1	2	3
i.	_____	1	2	3
j.	_____	1	2	3

Q10. There are various types of elderly housing: Assisted Living, Managed Care, and Congregate Housing. In all cases the added burden from these units on our Town expenses would be less than the burden from normal family dwellings because there are no school-aged children added to the Town when the units are occupied. How do you feel about promoting the following types of Elderly Housing in Shutesbury? Please circle a number for each item where 1 = Agree; 2 = Don't Know; and 3 = Disagree.

		Agree	Don't Know	Disagree
a.	Elder Housing - <i>This very common type of elderly housing involves individual dwelling units within one stand-alone residence.</i>	1	2	3
b.	Congregate Housing - <i>Usually this involves individual apartments within a shared space. A team of multi-disciplinary service providers provide shared meals, activities, and case management.</i>	1	2	3
c.	Assisted Living / Supportive Housing - <i>This type is less common and more service rich of the three types. This is simply a Congregate Housing facility with a higher degree of service provided including meals, health care management, laundry, activities etc.</i>	1	2	3

Q11. Are you in favor of Special Needs Housing in Shutesbury? Please circle a number for each item where 1 = Favor; 2 = Don't Know; and 3 = Oppose.

		Favor	Don't Know	Oppose
a.	Housing for the Mentally Disabled - <i>A local mental health care provider will usually rent a local residence, which may be staffed full or part time.</i>	1	2	3
b.	Housing for the Physically Disabled - <i>This may take the form of upgrading an existing residence to be wheelchair accessible and to contain community rooms.</i>	1	2	3

Q12. The following lists a variety of housing issues. Please indicate how important each issue is to you. Circle a number for each item where 1 = Favor; 2 = Don't Know; and 3 = Oppose.

		Favor	Don't Know	Oppose
a.	Development of elderly housing	1	2	3
b.	Lead paint removal assistance program to meet State mandates	1	2	3
c.	Financial assistance to help comply with the State's Title 5 septic system mandates	1	2	3
d.	Development of programs that support first-time home buyers	1	2	3
e.	Development of affordable housing for low and moderate income families	1	2	3
f.	Grants for rehabilitation of low and moderate income housing	1	2	3
g.	Other (please list) _____	1	2	3
h.	_____	1	2	3
i.	_____	1	2	3
j.	_____	1	2	3

ECONOMIC DEVELOPMENT

Given the property tax situation in Shutesbury, many have asked how other communities have lower taxes but still offer good Town services. The answer is usually Town revenues from taxes on business property. Shutesbury presently has only a few businesses. The following questions relate to the issue of business in Shutesbury.

Q13. Please indicate whether you oppose, don't care about, or whether you support increases in the following types of development. Circle a number for each item where 1 = Favor; 2 = Don't Care; and 3 = Oppose.

		Favor	Don't Care	Oppose
a.	Dentist	1	2	3
b.	Doctor	1	2	3
c.	Veterinarian	1	2	3
d.	Small Manufacturing - 25 employees or fewer, goods pickup and delivery trucking	1	2	3
e.	Software Development – 25 employees or fewer, very little truck traffic	1	2	3
f.	Distribution/Warehouse/Depot – heavy truck traffic	1	2	3
g.	Retail Stores	1	2	3
h.	Gas Station/Convenience Store	1	2	3
i.	Crop/Truck Farming	1	2	3
j.	Home Businesses	1	2	3
k.	Arts and Crafts	1	2	3
l.	Bed & Breakfast	1	2	3

Q14. Please check the most appropriate box for the two questions below.

		Oppose	Don't Care	Support
a.	The Town should have a separate and higher tax for commercial businesses?			
b.	The Town should have a separate and higher tax rate for residential?			

Q15. Please list any creative idea you might have for increasing Town revenues in ways other than property taxes.

CAPITAL IMPROVEMENTS AND MUNICIPAL SERVICES

The next six questions ask you to consider Shutesbury's long-term capital needs and evaluate the importance of various municipal services including the school system, the library, and recreational programs in Town. Capital Improvement Programming is planning for the Town's future spending.

Q16. Which of the following would you like to see over the next ten years? Please circle a number for each item where 1 = Very Important; 2 = Important; and 3 = Not Important.

		Very Important	Important	Not Important
a.	24 hour police department	1	2	3
b.	Ambulance service	1	2	3
c.	Better maintained roads	1	2	3
d.	Department of Public Works building	1	2	3
e.	Expanded school facilities	1	2	3
f.	Full-time fire department	1	2	3
g.	Management of conservation lands	1	2	3
h.	More paved roads	1	2	3
i.	New highway maintenance equipment	1	2	3
j.	New expanded library	1	2	3
k.	Open space acquisition	1	2	3
l.	Recreational facilities	1	2	3
m.	Renovation of the School	1	2	3
n.	Renovation of the Fire Station	1	2	3
o.	Renovation of the Town Hall Annex	1	2	3
p.	Renovation of the Town Hall	1	2	3
q.	Renovation of the Highway Department facilities	1	2	3
r.	Town sewer	1	2	3
s.	Town water	1	2	3
t.	More/improved public parks	1	2	3
u.	Other (please list) _____	1	2	3
v.	_____	1	2	3
w.	_____	1	2	3

Q17. Would you like to see the Town spend more, less, or the same amount of money on each of the following municipal budget items? Please check the appropriate box for each item.

	Budget Item	More	Less	Same
a.	Administrative services			
b.	Community events			
c.	Conservation of natural resources			
d.	Fire protection			
e.	Ambulance services			
f.	Library			
g.	Planning			
h.	Police protection (e.g. patrolling local roads, number of hours available)			
i.	Recreation			
j.	Roads (e.g. condition of roads and level of maintenance)			
k.	Schools			
l.	Youth programs and services			
m.	Other (please list) _____			
n.	_____			
o.	_____			

Q18. What are the key issues the Town should address? Please place a check in the box to the right of the top five issues. In the comments box, briefly explain what it is that is so important about each of the top five issues.

	Issue		Comments
a.	School class sizes		
b.	The school curriculum		
c.	General Government hours		
d.	Recreational fields		
e.	Bike trails		
f.	Hiking trails		
g.	Street lighting		
h.	The likelihood that a procedure to accept private roads is adopted		
i.	Accessibility of the Town and School newsletters (i.e. on line)		
j.	Quality of mapping and associated filing		
k.	Accessibility and comprehension of Shutesbury's bylaws and policies		
l.	Other (please list)		
m.			
n.			

Q19. Would you like to use a transit service if it came to Shutesbury? ___ Yes ___ No
If you answered No to Q19, please skip to Q22.

Q20. Where would you like the transit service to go? Please check the destination(s) that you would favor.

- Amherst
- Greenfield
- Northampton
- Other _____
- _____

Q21. How often would you use the transit service? _____ Daily _____ Weekly

ZONING AND LAND USE

The following questions deal with zoning and land use issues in Shutesbury.

Q22. Do you agree with the following statements? Please circle a number for each item where 1 = Agree; 2 = Don't Know/Don't Care; and 3 = Disagree.

		Agree	Don't Know/ Don't Care	Disagree
a.	Zoning should be changed to allow some types of commercial uses by right.	1	2	3
b.	Zoning should be changed to allow some light manufacturing in some areas by right.	1	2	3
c.	Zoning should not be changed.	1	2	3
d.	The zoning bylaws should limit communication towers to different districts.	1	2	3
e.	Shutesbury should make it easier for builders to build affordable housing.	1	2	3
f.	Encourage development of houses in clusters on a small part of the property so that the remaining land is protected.	1	2	3
g.	Encourage development of houses in the back of property so that land along the roads may be protected as agricultural land, forest, or open space.	1	2	3
h.	Encourage development of houses along the roads so that land in the back may be protected as agricultural land, forest, or open space.	1	2	3
i.	Zoning should restrict multiple family/duplex housing.	1	2	3
j.	Existing high density areas of Town should have special zoning to control development.	1	2	3

Q23. Massachusetts General Law Ch. 40, s. 15C authorizes a municipality, upon recommendation of its planning board, conservation commission, or historical commission to designate local "scenic roads." The purpose of this statute is to provide for planning board review of the cutting or removal of trees or the alteration of stone walls incidental to work on the scenic road. How important do you believe it is to maintain scenic conditions (for example, large trees and stone walls) along roads in Shutesbury? Please circle the number of the statement, which you agree with the most.

1 = very important to Shutesbury's rural character!

2 = important.

3 = I'm ambivalent.

4 = I don't like large trees along roads.

5 = I hate trees and stone walls along roads. They should all be cut down and removed.

Q24. Would you favor establishment of a telecommunications tower on Town-owned property rather than on private property in Shutesbury, which would generate modest income (between \$12,000 and \$24,000 per year) for the Town annually? Please circle the number of the statement, which you agree with the most.

1 = yes, definitely!

2 = no towers on Town-owned land; towers on private land only.

3 = I don't know

Q25. List the top five (5) issues you believe the Master Plan needs to focus on?

1. _____
2. _____
3. _____
4. _____
5. _____

Q26. What do you wish we had asked?

TELL US ABOUT YOURSELF

This set of questions asks you to offer some information about yourself. These answers simply help in the analysis process and will remain anonymous. You may skip any question that you would rather not answer.

Q27. What is your age? Please circle the range of ages that includes your age.

1. 0 – 19 years old
2. 20 – 44 years old
3. 45 – 64 years old
4. 65 – 78 years old
5. 79 years old or Older

Q28. Please write your street address.

Q29. Are you a full-time resident or a seasonal resident? *Please check one.*

Full-time Resident

Seasonal Resident

Q30. Do you have a home-based business or profession?

Yes No

Q31. Please check off the location where you work.

Amherst

Greenfield

Shutesbury

Northampton

Northern Franklin County

Eastern Franklin County

Boston

Other _____

Q32. Have you ever served on a Town committee? *Please check one.*

Yes No

Q33. How long have you lived in Shutesbury? *Please fill in the number of years and/ or months.*

_____ years _____ months.

You have finished! Thank you for completing the survey. Do you have any other thoughts regarding the creation of the Master Plan or the Goals and Objectives? We welcome your comments on the next page or you can submit them on a separate piece of paper.

Comments:

Thank you again for completing the survey. Please fill out the form below to enter the prize drawing to win a variety of prizes generously donated by Shutesbury residents. **There are three ways to return your survey and entry form: 1)** leave the entry form attached to your survey, return the survey in the pre-stamped return envelope, and we will remove the entry form before we begin any analysis so your responses remain anonymous; **2)** drop the survey and entry form off at the Shutesbury Town Hall, the Public Library, or the Shutesbury Post Office. There will be a box for surveys and a box for entry forms; **3)** send the survey and the entry form back in two separate envelopes to the Shutesbury Master Plan Committee.

Mailing the survey: Please return the survey in the pre-stamped envelope by _____ to:
Shutesbury Master Plan Committee, Town of Shutesbury

att. Master Plan Survey

About the drop-off points:

Entry Prize Form

.....

Name: _____

Address: _____

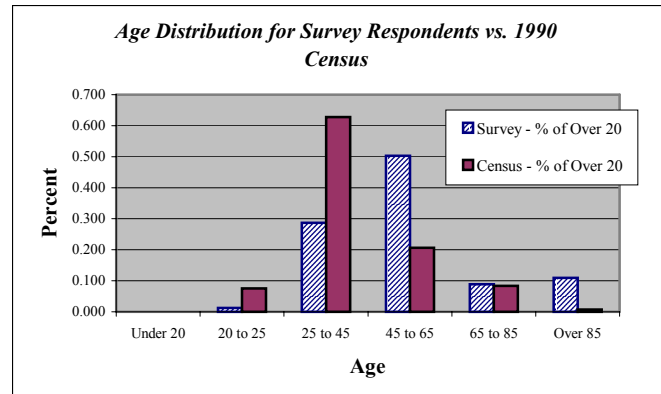
Telephone Number: _____

Shutesbury Survey Highlights *The Town Plan Committee*

During fall 2000, we conducted a survey of Shutesbury landowners and residents. We mailed a total 1275 surveys; 331 were returned for a response rate of about 26%. We've been busy analyzing data and reading the written comments on the surveys. This short summary provides highlights of the numerical data that we gathered from respondents.

The first question we asked about our survey was: "Who responded and do they represent Shutesbury residents?" To find out, we compared some of our information to 1990

Census figures. The graph at the right compares the age distribution of respondents over 20 to the 1990 Census distribution. We expected some differences, especially with the growth that has occurred in Shutesbury in the last 10 years, but we conclude that our survey represents the population of Shutesbury fairly well. Most of the respondents are full time residents (83%). Their average age is 49 and the average household size is 2.75 people. Most (70%) plan to remain in Shutesbury for the next 5 years.



So what do respondents like about Shutesbury? We asked what factors were most important to their satisfaction with living in Shutesbury. *The* most important factor was **peace and quiet**; 85% of the respondents said this was *very important*. The other leading factors chosen as *very important* included: **air and water quality (83%)**; **open fields, forests and trails (80%)**; **rural and small town character (77%)**; and **lake and stream quality (69%)**. When asked what the rural character of Shutesbury meant to them, 80% of the respondents again chose **quiet** as *very important*. The other top factors considered *very important* included: **large forested areas (75%)**; **absence of city lights (70%)**; **lower housing density (69%)**; **walking and hiking trails (69%)**; and **low traffic volume and speed (68%)**.

We also asked respondents to tell us how important it is to conserve natural resources. Nearly all respondents (92%) agreed that the conservation of **clean drinking water** was *very important*. A majority of respondents also chose conservation of **clean air (90%)**, **lakes and streams (84%)**, **forests (79%)**, **rural character (79%)**, and **wildlife habitat (78%)** as *very important*. When asked what forms of protection and conservation of open space and natural resources they supported, 93% said they *strongly supported or supported acceptance of gifts to the town of conservation land*. In fact, most of the respondents (78%) *strongly supported* this approach to conservation. Among other conservation options, 83% *strongly supported or supported* the **town purchase of conservation land** (56% *strongly supported* this option) and 80% *strongly supported or supported zoning changes for open space protection and conservation* (54% *strongly*). The **acceptance of gifts to the town of development rights** was *strongly supported or supported* by 72% of the respondents.

The survey also asked opinions about a number of different development options. Of twelve offered, eight were *avored* by more than half the respondents. They were: **home businesses (76%)**; **bed & breakfast (73%)**; **arts & crafts (72%)** **dentist/doctor/veterinarian (60%)**; **restaurant/coffee shop (59%)**; **gas station/convenience store (53%)**; and **crop/truck farming (53%)**. Of the remaining suggestions, **very small manufacturing, 1-5 employees** was *avored* by 48% of the respondents. Several housing options were suggested, only **single family residential (73%)** was *avored* by more than half of the respondents. **Cluster residential** was *avored* by about half (49%) of the respondents. More than half the respondents agreed with the promotion of **elder housing (57%)** and **congregate housing for elders (51%)**.

A list of statements were provided that dealt with zoning and land-use issues. There were five statements with which more than 50% of the respondents agreed. Those statements dealt with zoning changes to: direct and restrict commercial and manufacturing uses; encourage cluster development; limit communication towers in town; restrict multiple family and duplex housing; and control development in existing high density areas of town. Between 50 and 54% of the respondents agreed with these statements.

To help us plan for the future, we asked what residents would like to see happen over the next 10 years. The two suggestions that would maintain and protect our rural character and natural resources were chosen as important by the greatest number of respondents. **Care of conservation lands** was chosen as *important or very important* by 75% of the respondents, 30% said it was *very important*. **Open space acquisition** was chosen as *important or very important* by 69% of the respondents, 29% said it was *very important*. Other investments that respondents considered *important or very important* included: **ambulance services** (63%); **increased road maintenance** (59%); and a **new expanded library** (54%). A number of investments were chosen as *important or very important* by over 40% of the respondents. They included: **expanded school curricula** (49%); **high-speed Internet access** (47%); **24 hour police department** (46%); **full-time fire department** (43%) and **after-school programming** (42%).

We also asked the tough question: “Are you willing to have taxes increase to pay for these capital improvements?” **Ambulance service** received the most votes, with 38% of the respondents selecting *yes*. **Open space acquisition** and **care of conservation lands** followed with 35% and 33% *yes* votes, respectively, and 30% of the respondents said *yes* to the **new expanded library**.

One final question that we’ll review in our summary is how respondents viewed the allocation of town expenditures. We asked the respondents whether the town should spend more, less or the same amount of money on a number of budget items. Rather than choose *highlights* based on those categories with the greatest number of *more* votes or the greatest number of *less* votes, the entire table is presented below for your review.

Budget Item	More	Same	Less	No Response
Administrative services	7.3	66.1	9.4	17.3
Community events	18.8	55.2	8.5	17.6
Management/improvement of Town conservation lands	25.8	49.4	8.5	16.4
Protection/acquisition of additional Town Conservation lands (either through purchase, or purchase of development rights)	38.2	33.9	10.3	17.6
Fire protection	20.3	60.0	2.7	17.0
Ambulance services	24.2	54.6	3.6	17.6
Library	29.7	45.5	9.4	15.5
Planning	17.0	55.2	8.5	19.4
Police protection (e.g. patrolling local roads, number of hours available)	22.4	50.3	12.4	14.9
Recreation	9.4	56.4	13.6	20.6
Roads (e.g. condition of roads and level of maintenance)	29.1	53.3	3.3	14.2
Shutesbury Elementary School	14.2	48.5	20.9	16.4
Amherst-Pelham Regional Jr./Sr. High District	7.3	50.6	24.9	17.3
Youth programs and services	23.6	45.5	11.2	19.7

We got a number of complete tables that we’ve assembled. If you are interested in more Shutesbury Survey information or have comments, contact David Kittredge at 259-1756. Any *glowing* comments can be directed to Dan Lass at 259-1930.

<i>How important are the following to your satisfaction with living in Shutesbury?</i>				
	Very Important	Important	Not Important	No Response
Peace and quiet	84.9	12.7	0.3	2.1
Air/drinking water quality	83	14.6	0.6	1.8
Open fields, forests, trails	80.3	15.5	1.5	2.7
Rural or small town character	77	18.5	2.1	2.4
Lake and stream water quality	68.8	27.3	1.8	2.1
Safety from crime and vandalism	62.1	29.1	6.4	2.4

<i>How important is it to conserve the following natural and scenic resources?</i>				
	Very Important	Important	Not Important	No Response
Clean drinking water	92.1	7.6	0	0.3
Clean air	90	8.5	0.6	0.9
Lakes and streams	83.6	14.9	0.9	0.6
Forests	79.4	18.2	1.2	1.2
Rural character	78.8	16.1	2.7	2.4
Wildlife habitat	78.2	17.9	2.7	1.2

<i>Which do you support to protect/conserve open space and natural resources?</i>				
	Strongly Support	Support	Don't Support	No Response
Acceptance of gifts to the Town of conservation land	77.6	15.8	0.3	6.4
Town purchase of conservation land	56.4	27	8.8	7.9
Zoning changes for open space protection/conservation	53.9	26.4	7.9	11.8
Acceptance of gifts to the Town of development rights	50.9	20.9	10.6	17.6

<i>What does rural character in Shutesbury mean to you?</i>				
	Very Important	Important	Not Important	No Response
Quiet	80.3	15.2	1.5	3
Large forested areas	74.6	19.4	1.5	4.6
Absence of city lights	70	17	7.6	5.5
Lower housing density	69.4	20.3	5.2	5.2
Walking and hiking trails	68.5	21.2	4.9	5.5
Low traffic volume/slow speeds	67.9	20	6.7	5.5

	Favor	Unsure	Oppose	No Response
Single family residential: <i>2 acre or larger lots</i>	73.3	12.7	6.1	7.9
Cluster residential: <i>development of houses in clusters on a small part of the property so that the remaining land is protected as open space</i>	49.4	25.2	20	5.5
Duplex (Two-family) residential: <i>3 acre or larger lots</i>	29.7	27	33.3	10
Conversion of single family housing to multi-family units	15.2	23.6	50.9	10.3

	Agree	Don't Know	Disagree	No Response
Elder Housing - <i>very common type of elderly housing involves individual dwelling units within one stand-alone residence.</i>	57	24.2	10.6	8.2
Congregate Housing - <i>Usually involves individual apartments within a shared space; team of multi-disciplinary service providers provide shared meals, activities, and case management.</i>	51.2	23.9	17	7.9
Assisted Living / Supportive Housing - <i>less common and most service rich of the three types; simply a Congregate Housing facility with more service provided including meals, health care management, laundry, activities etc.</i>	45.2	26.7	20.6	7.6

<i>Please indicate whether you oppose, don't care about, or whether you support increases in the following types of development.</i>				
	Favor	Don't Care	Oppose	No Response
Home Businesses	75.8	17.9	2.1	4.2
Bed & Breakfast	73	17	6.4	3.6
Arts and Crafts	71.5	21.5	2.4	4.6
Dentist/ Doctor/ Veterinarian	59.7	26.7	7.9	5.8
Restaurant/ coffee shop	58.8	24.9	13.3	3

<i>Which of the following would you like to see over the next ten years?</i>				
	Very Important	Important	Not Important	No Response
Care of conservation lands	30	44.6	16.1	9.4
Open space acquisition	28.8	40	19.1	12.1
Ambulance service	24.6	39.7	24.6	11.2
High-speed Internet access	23.6	23.9	44.2	8.2
Expanded school curricula (foreign language, music, art)	20	29.3	38.5	12.1
Increased road maintenance	19.7	39.1	30.3	10.9
New expanded library	19.4	34.6	37.3	8.8
24 hour police department	17.6	28.5	45.2	8.8
Full-time fire department	12.1	31.2	43.9	12.7
After-School programming	11.8	30	45.8	12.4

<i>Are you willing to have taxes increase to pay for these capital improvements?</i>			
	Yes	No	No Response
Ambulance service	37.9	43.6	18.5
Open space acquisition	34.6	45.8	19.7
Care of conservation lands	32.7	47.9	19.4
New expanded library	30	50.9	19.1
Expanded school curricula (foreign language, music, art)	28.8	49.4	21.8
Increased road maintenance	28.5	50.3	21.2
New highway maintenance equipment	27.9	46.4	25.8
24 hour police department	23.3	58.2	18.5
Full-time fire department	21.8	52.7	25.5
Renovation of the Fire Station	20.6	50.3	29.1

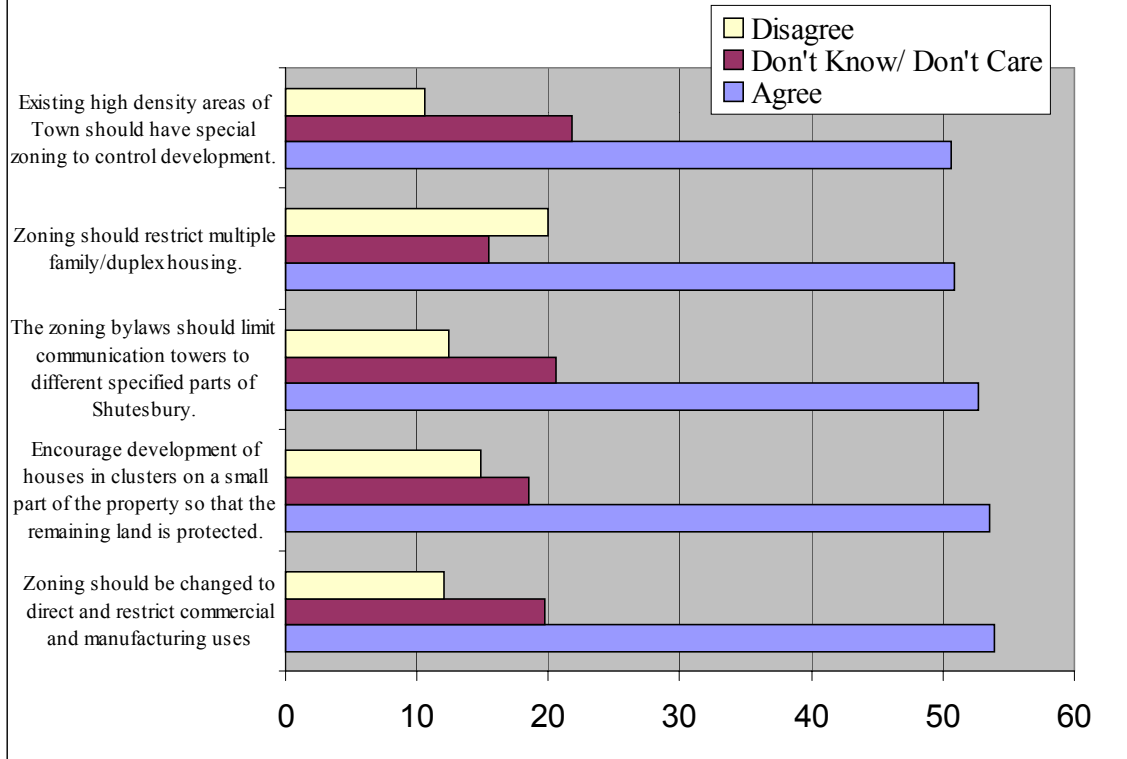
Would you like to see the Town spend more, less, or the same amount of money on each of the following municipal budget items?

Budget Item	More	Same	Less	No Response
Protection/acquisition of additional Town Conservation lands (either through purchase, or purchase of development rights)	38.2	33.9	10.3	17.6
Library	29.7	45.5	9.4	15.5
Roads (e.g. condition of roads and level of maintenance)	29.1	53.3	3.3	14.2
Management/improvement of Town conservation lands	25.8	49.4	8.5	16.4
Ambulance services	24.2	54.6	3.6	17.6

Do you agree with the following statements?

	Agree	Don't Know/ Don't Care	Disagree	No Response
Zoning should be changed to direct and restrict commercial and manufacturing uses	53.9	19.7	12.1	14.2
Encourage development of houses in clusters on a small part of the property so that the remaining land is protected.	53.6	18.5	14.9	13
The zoning bylaws should limit communication towers to different specified parts of Shutesbury.	52.7	20.6	12.4	14.2
Zoning should restrict multiple family/duplex housing.	50.9	15.5	20	13.6
Existing high density areas of Town should have special zoning to control development.	50.6	21.8	10.6	17

Do you agree with the following statements?



APPENDIX B
NATURAL RESOURCES
AND OPEN SPACE

Appendix: Inventory of Species Identified during the Biodiversity Days Field Trips in Shutesbury-2000-2002.

English Name	Latin Name	Group	NHESP Status	Link to Species Tree	Date Found	Location Found
American Toad	Bufo americanus	Amphibians		SpeciesTree	05/31/2002	Lake Wyola
American Toad	Bufo americanus	Amphibians		SpeciesTree	06/08/2001	Wetlands around these two ponds
Eastern Newt. Red-spotted Newt	Notophthalmus viridescens	Amphibians		SpeciesTree	06/08/2001	Wetlands around these two ponds
Eastern Newt. Red-spotted Newt	Notophthalmus viridescens	Amphibians		SpeciesTree	05/31/2002	Lake Wyola
Eastern Newt. Red-spotted Newt	Notophthalmus viridescens	Amphibians		SpeciesTree	05/31/2002	MDC property
Eastern Newt. Red-spotted Newt	Notophthalmus viridescens	Amphibians		SpeciesTree	06/09/2001	Nearby wetlands
Red-backed Salamander	Plethodon cinereus	Amphibians		SpeciesTree	06/10/2001	Nearby area
Green Frog	Rana clamitans	Amphibians		SpeciesTree	06/10/2001	Nearby area
Green Frog	Rana clamitans	Amphibians		SpeciesTree	06/08/2001	Wetlands around these two ponds
Wood Frog	Rana sylvatica	Amphibians		SpeciesTree	06/10/2001	Nearby area
Carpenter Ant	Camponotus americanus	Ants		SpeciesTree	05/31/2002	MDC property
Ants	Formicidae	Ants		SpeciesTree	05/31/2002	MDC property
Little Brown Bat	Myotis lucifugus	Bats		SpeciesTree	06/10/2000	Specialist Sightings
Bumble Bees	Bombus	Bees and Wasps		SpeciesTree	06/09/2001	Nearby wetlands
Red-winged Blackbird	Agelaius phoeniceus	Birds		SpeciesTree	05/31/2002	Lake Wyola
Red-winged Blackbird	Agelaius phoeniceus	Birds		SpeciesTree	06/08/2001	Wetlands around these two ponds
Red-winged Blackbird	Agelaius phoeniceus	Birds		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Blue-winged Teal	Anas discors	Birds		SpeciesTree	05/31/2002	Lake Wyola
Mallard	Anas platyrhynchos	Birds		SpeciesTree	06/08/2001	Wetlands around these two ponds
Ruby-throated Hummingbird	Archilochus colubris	Birds		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola

Ruby-throated Hummingbird	Archilochus colubris	Birds		SpeciesTree	05/31/2002	Lake Wyola
Great Blue Heron	Ardea herodias	Birds		SpeciesTree	06/01/2002	Montague Road
Great Blue Heron	Ardea herodias	Birds		SpeciesTree	05/31/2002	MDC property
Tufted Titmouse	Baeolophus bicolor	Birds		SpeciesTree	05/31/2002	Lake Wyola
Canada Goose	Branta canadensis	Birds		SpeciesTree	05/31/2002	Lake Wyola
Great Horned Owl	Bubo virginianus	Birds		SpeciesTree	05/31/2002	Lake Wyola
Red-tailed Hawk	Buteo jamaicensis	Birds		SpeciesTree	05/31/2002	MDC property
Northern Cardinal, Red Cardinal	Cardinalis cardinalis	Birds		SpeciesTree	06/08/2001	Roadside Inventory
American Goldfinch	Carduelis tristis	Birds		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
American Goldfinch	Carduelis tristis	Birds		SpeciesTree	05/31/2002	Lake Wyola
Turkey Vulture	Cathartes aura	Birds		SpeciesTree	05/31/2002	Lake Wyola
Veery	Catharus fuscescens	Birds		SpeciesTree	06/08/2001	Wetlands around these two ponds
Hermit Thrush	Catharus guttatus	Birds		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Hermit Thrush	Catharus guttatus	Birds		SpeciesTree	05/31/2002	Lake Wyola
Hermit Thrush	Catharus guttatus	Birds		SpeciesTree	05/31/2002	MDC property
Northern Flicker, Yellow-shafted Flicker	Colaptes auratus	Birds		SpeciesTree	05/31/2002	Lake Wyola
Northern Flicker, Yellow-shafted Flicker	Colaptes auratus	Birds		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Eastern Wood-Pewee	Contopus virens	Birds		SpeciesTree	06/08/2001	Roadside Inventory
Eastern Wood-Pewee	Contopus virens	Birds		SpeciesTree	05/31/2002	Lake Wyola
Blue Jay	Cyanocitta cristata	Birds		SpeciesTree	05/31/2002	MDC property
Blue Jay	Cyanocitta cristata	Birds		SpeciesTree	05/31/2002	Lake Wyola

Blue Jay	Cyanocitta cristata	Birds		SpeciesTree	06/01/2002	Montague Road
Blue Jay	Cyanocitta cristata	Birds		SpeciesTree	06/08/2001	Roadside Inventory
Blue Jay	Cyanocitta cristata	Birds		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Black-throated Blue Warbler	Dendroica caerulescens	Birds		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Black-throated Blue Warbler	Dendroica caerulescens	Birds		SpeciesTree	05/31/2002	MDC property
Black-throated Blue Warbler	Dendroica caerulescens	Birds		SpeciesTree	05/31/2002	Lake Wyola
Yellow-rumped Warbler Myrtle Warbler	Dendroica coronata	Birds		SpeciesTree	05/31/2002	Lake Wyola
Yellow-rumped Warbler Myrtle Warbler	Dendroica coronata	Birds		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Yellow-throated Warbler	Dendroica dominica	Birds		SpeciesTree	05/31/2002	Lake Wyola
Blackburnian Warbler	Dendroica fusca	Birds		SpeciesTree	05/31/2002	Lake Wyola
Black-throated Green Warbler	Dendroica virens	Birds		SpeciesTree	05/31/2002	Lake Wyola
Black-throated Green Warbler	Dendroica virens	Birds		SpeciesTree	05/31/2002	MDC property
Black-throated Green Warbler	Dendroica virens	Birds		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Pileated Woodpecker	Dryocopus pileatus	Birds		SpeciesTree	05/31/2002	MDC property
Pileated Woodpecker	Dryocopus pileatus	Birds		SpeciesTree	05/31/2002	Lake Wyola
Gray Catbird	Dumetella carolinensis	Birds		SpeciesTree	05/31/2002	Lake Wyola
Common Yellowthroat	Geothlypis trichas	Birds		SpeciesTree	06/09/2001	Nearby wetlands
Common Yellowthroat	Geothlypis trichas	Birds		SpeciesTree	05/31/2002	Lake Wyola
Common Yellowthroat	Geothlypis trichas	Birds		SpeciesTree	06/08/2001	Roadside Inventory

Common Yellowthroat	Geothlypis trichas	Birds		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Wood Thrush	Hylocichla mustelina	Birds		SpeciesTree	06/08/2001	Roadside Inventory
Baltimore Oriole	Icterus galbula	Birds		SpeciesTree	05/31/2002	Lake Wyola
Wild Turkey	Meleagris gallopavo	Birds		SpeciesTree	05/31/2002	Lake Wyola
Song Sparrow	Melospiza melodia	Birds		SpeciesTree	05/31/2002	Lake Wyola
Song Sparrow	Melospiza melodia	Birds		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Song Sparrow	Melospiza melodia	Birds		SpeciesTree	06/08/2001	Wetlands around these two ponds
Black-and-white Warbler	Mniotilta varia	Birds		SpeciesTree	05/31/2002	Lake Wyola
Black-and-white Warbler	Mniotilta varia	Birds		SpeciesTree	05/31/2002	MDC property
Brown-headed Cowbird	Molothrus ater	Birds		SpeciesTree	05/31/2002	Lake Wyola
Great Crested Flycatcher	Myiarchus crinitus	Birds		SpeciesTree	06/10/2000	Specialist Sightings
Osprey	Pandion haliaetus	Birds		SpeciesTree	05/31/2002	Lake Wyola
Rose-breasted Grosbeak	Pheucticus ludovicianus	Birds		SpeciesTree	05/31/2002	MDC property
Downy Woodpecker	Picoides pubescens	Birds		SpeciesTree	06/08/2001	Roadside Inventory
Eastern Towhee, Rufous-sided Towhee	Pipilo erythrophthalmus	Birds		SpeciesTree	06/08/2001	Roadside Inventory
Eastern Towhee, Rufous-sided Towhee	Pipilo erythrophthalmus	Birds		SpeciesTree	06/08/2001	Wetlands around these two ponds
Eastern Towhee, Rufous-sided Towhee	Pipilo erythrophthalmus	Birds		SpeciesTree	05/31/2002	Lake Wyola
Eastern Towhee, Rufous-sided Towhee	Pipilo erythrophthalmus	Birds		SpeciesTree	06/01/2002	Montague Road
Eastern Towhee, Rufous-sided Towhee	Pipilo erythrophthalmus	Birds		SpeciesTree	05/31/2002	MDC property

Scarlet Tanager	Piranga olivacea	Birds		SpeciesTree	05/31/2002	Lake Wyola
Black-capped Chickadee	Poecile atricapillus	Birds		SpeciesTree	05/31/2002	Lake Wyola
Black-capped Chickadee	Poecile atricapillus	Birds		SpeciesTree	06/01/2002	Montague Road
Black-capped Chickadee	Poecile atricapillus	Birds		SpeciesTree	05/31/2002	MDC property
Black-capped Chickadee	Poecile atricapillus	Birds		SpeciesTree	06/08/2001	Wetlands around these two ponds
Black-capped Chickadee	Poecile atricapillus	Birds		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Purple Martin	Progne subis	Birds		SpeciesTree	05/31/2002	Lake Wyola
Eastern Phoebe	Sayornis phoebe	Birds		SpeciesTree	05/31/2002	Lake Wyola
Eastern Phoebe	Sayornis phoebe	Birds		SpeciesTree	06/09/2001	Nearby wetlands
Eastern Phoebe	Sayornis phoebe	Birds		SpeciesTree	06/08/2001	Roadside Inventory
American Woodcock	Scolopax minor	Birds		SpeciesTree	06/09/2001	Nearby wetlands
American Woodcock	Scolopax minor	Birds		SpeciesTree	05/31/2002	Lake Wyola
Ovenbird	Seiurus aurocapillus	Birds		SpeciesTree	05/31/2002	MDC property
Ovenbird	Seiurus aurocapillus	Birds		SpeciesTree	05/31/2002	Lake Wyola
Ovenbird	Seiurus aurocapillus	Birds		SpeciesTree	06/08/2001	Roadside Inventory
Ovenbird	Seiurus aurocapillus	Birds		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
White-breasted Nuthatch	Sitta carolinensis	Birds		SpeciesTree	05/31/2002	Lake Wyola
House Wren	Troglodytes aedon	Birds		SpeciesTree	05/31/2002	Lake Wyola
Winter Wren	Troglodytes troglodytes	Birds		SpeciesTree	05/31/2002	Lake Wyola
American Robin	Turdus migratorius	Birds		SpeciesTree	05/31/2002	Lake Wyola
American Robin	Turdus migratorius	Birds		SpeciesTree	06/08/2001	Roadside Inventory
American Robin	Turdus migratorius	Birds		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Red-eyed Vireo	Vireo olivaceus	Birds		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola

Red-eyed Vireo	Vireo olivaceus	Birds		SpeciesTree	05/31/2002	Lake Wyola
Blue-headed Vireo, Solitary Vireo	Vireo solitarius	Birds		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Mourning Dove	Zenaida macroura	Birds		SpeciesTree	06/08/2001	Roadside Inventory
Meadow Fritillary	Boloria (Clossiana) bellona	Butterflies		SpeciesTree	06/08/2001	Wetlands around these two ponds
Eastern Tiger Swallowtail	Papilio glaucus	Butterflies		SpeciesTree	06/08/2001	Roadside Inventory
Eastern Tiger Swallowtail	Papilio glaucus	Butterflies		SpeciesTree	06/01/2002	Montague Road
Eastern Tiger Swallowtail	Papilio glaucus	Butterflies		SpeciesTree	05/31/2002	MDC property
White Corporal	Libellula exusta	Dragonflies		SpeciesTree	06/08/2001	Wetlands around these two ponds
Lady Fern	Athyrium filix-femina	Ferns and Fern Allies		SpeciesTree	06/08/2001	Roadside Inventory
Lady Fern	Athyrium filix-femina	Ferns and Fern Allies		SpeciesTree	06/09/2001	Nearby wetlands
MacKay's Fragile Fern, MacKay's Brittle Fern, MacKay's Bladder-fern	Cystopteris tenuis	Ferns and Fern Allies		SpeciesTree	06/09/2001	Nearby wetlands
Hay-scented Fern	Dennstaedtia punctilobula	Ferns and Fern Allies		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Hay-scented Fern	Dennstaedtia punctilobula	Ferns and Fern Allies		SpeciesTree	06/09/2001	Nearby wetlands
Hay-scented Fern	Dennstaedtia punctilobula	Ferns and Fern Allies		SpeciesTree	06/08/2001	Roadside Inventory
Mountain Wood-fern	Dryopteris campyloptera	Ferns and Fern Allies	Watch List	SpeciesTree	06/09/2001	
Crested Wood-fern	Dryopteris cristata	Ferns and Fern Allies		SpeciesTree	06/09/2001	Nearby wetlands
Intermediate Wood-fern, Glandular Wood-fern, Fancy Fern	Dryopteris intermedia	Ferns and Fern Allies		SpeciesTree	06/09/2001	Nearby wetlands
Field-horsetail, Common Horsetail	Equisetum arvense	Ferns and Fern Allies		SpeciesTree	06/08/2001	Roadside Inventory
Shining Clubmoss	Huperzia lucidula	Ferns and Fern Allies		SpeciesTree	06/08/2001	Wetlands around these two ponds

Northern Bog-clubmoss	Lycopodiella inundata	Ferns and Fern Allies		SpeciesTree	06/01/2002	Montague Road
Staghorn Clubmoss, Running Clubmoss, Common Clubmoss	Lycopodium clavatum	Ferns and Fern Allies		SpeciesTree	06/01/2002	Montague Road
Staghorn Clubmoss, Running Clubmoss, Common Clubmoss	Lycopodium clavatum	Ferns and Fern Allies		SpeciesTree	06/08/2001	Wetlands around these two ponds
Ground-pine, Princess-pine, Tree-clubmoss	Lycopodium obscurum	Ferns and Fern Allies		SpeciesTree	06/08/2001	Wetlands around these two ponds
Ground-pine, Princess-pine, Tree-clubmoss	Lycopodium obscurum	Ferns and Fern Allies		SpeciesTree	06/09/2001	Nearby wetlands
Ground-pine, Princess-pine, Tree-clubmoss	Lycopodium obscurum	Ferns and Fern Allies		SpeciesTree	06/01/2002	Montague Road
Sensitive Fern	Onoclea sensibilis	Ferns and Fern Allies		SpeciesTree	06/01/2002	Montague Road
Sensitive Fern	Onoclea sensibilis	Ferns and Fern Allies		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Sensitive Fern	Onoclea sensibilis	Ferns and Fern Allies		SpeciesTree	06/09/2001	Nearby wetlands
Sensitive Fern	Onoclea sensibilis	Ferns and Fern Allies		SpeciesTree	06/08/2001	Wetlands around these two ponds
Sensitive Fern	Onoclea sensibilis	Ferns and Fern Allies		SpeciesTree	06/08/2001	Roadside Inventory
Cinnamon-fern	Osmunda cinnamomea	Ferns and Fern Allies		SpeciesTree	06/08/2001	Wetlands around these two ponds
Cinnamon-fern	Osmunda cinnamomea	Ferns and Fern Allies		SpeciesTree	06/08/2001	Roadside Inventory
Cinnamon-fern	Osmunda cinnamomea	Ferns and Fern Allies		SpeciesTree	06/09/2001	Nearby wetlands
Cinnamon-fern	Osmunda cinnamomea	Ferns and Fern Allies		SpeciesTree	06/01/2002	Montague Road
Interrupted Fern	Osmunda claytoniana	Ferns and Fern Allies		SpeciesTree	06/09/2001	Nearby wetlands
Interrupted Fern	Osmunda claytoniana	Ferns and Fern Allies		SpeciesTree	06/08/2001	Roadside Inventory

Royal Fern	Osmunda regalis	Ferns and Fern Allies		SpeciesTree	06/09/2001	Nearby wetlands
Christmas-fern	Polystichum acrostichoides	Ferns and Fern Allies		SpeciesTree	06/08/2001	Roadside Inventory
Christmas-fern	Polystichum acrostichoides	Ferns and Fern Allies		SpeciesTree	05/31/2002	MDC property
Bracken Fern	Pteridium aquilinum	Ferns and Fern Allies		SpeciesTree	05/31/2002	MDC property
Bracken Fern	Pteridium aquilinum	Ferns and Fern Allies		SpeciesTree	06/01/2002	Montague Road
Bracken Fern	Pteridium aquilinum	Ferns and Fern Allies		SpeciesTree	06/08/2001	Roadside Inventory
New York Fern	Thelypteris noveboracensis	Ferns and Fern Allies		SpeciesTree	06/08/2001	Roadside Inventory
New York Fern	Thelypteris noveboracensis	Ferns and Fern Allies		SpeciesTree	06/09/2001	Nearby wetlands
Marsh Fern	Thelypteris palustris	Ferns and Fern Allies		SpeciesTree	06/09/2001	Nearby wetlands
Marsh Fern	Thelypteris palustris	Ferns and Fern Allies		SpeciesTree	06/01/2002	Montague Road
Mosquitoes	Aedes	Flies		SpeciesTree	05/31/2002	MDC property
Mosquitoes	Culicidae	Flies		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
American Horse Fly	Tabanus americanus	Flies		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Pumpkinseed Sunfish	Lepomis gibbosus	Freshwater Fish		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Bluegill	Lepomis macrochirus	Freshwater Fish		SpeciesTree	06/08/2001	Wetlands around these two ponds
N/A	Carex	Grasses, Sedges and Rushes		SpeciesTree	06/08/2001	Wetlands around these two ponds
N/A	Carex	Grasses, Sedges and Rushes		SpeciesTree	06/09/2001	Nearby wetlands
Awned Sedge, Fringed Sedge	Carex crinita	Grasses, Sedges and Rushes		SpeciesTree	06/08/2001	Roadside Inventory
Long-culmed Sedge	Carex folliculata	Grasses, Sedges and Rushes		SpeciesTree	06/08/2001	Wetlands around these two ponds
Tussock-sedge	Carex stricta	Grasses, Sedges and Rushes		SpeciesTree	06/08/2001	Wetlands around these two ponds
Tussock-sedge	Carex stricta	Grasses, Sedges and Rushes		SpeciesTree	06/08/2001	Roadside Inventory

Tussock-sedge	Carex stricta	Grasses, Sedges and Rushes		SpeciesTree	06/09/2001	Nearby wetlands
Tussock-sedge	Carex stricta	Grasses, Sedges and Rushes		SpeciesTree	06/01/2002	Montague Road
Threeway Sedge	Dulichium arundinaceum	Grasses, Sedges and Rushes		SpeciesTree	06/08/2001	Wetlands around these two ponds
Tawny or Virginia Cotton grass	Eriophorum virginicum	Grasses, Sedges and Rushes		SpeciesTree	06/08/2001	Wetlands around these two ponds
Marsh-rush, Canada Rush	Juncus canadensis	Grasses, Sedges and Rushes		SpeciesTree	06/08/2001	Wetlands around these two ponds
Soft Rush, Common Rush	Juncus effusus	Grasses, Sedges and Rushes		SpeciesTree	06/08/2001	Wetlands around these two ponds
Soft Rush, Common Rush	Juncus effusus	Grasses, Sedges and Rushes		SpeciesTree	06/08/2001	Roadside Inventory
Phragmites, Common Reed	Phragmites australis	Grasses, Sedges and Rushes		SpeciesTree	06/08/2001	Wetlands around these two ponds
Phragmites, Common Reed	Phragmites australis	Grasses, Sedges and Rushes		SpeciesTree	05/31/2002	Lake Wyola
Little Bluestem, Broom- or Prairie-beardgrass	Schizachyrium scoparium	Grasses, Sedges and Rushes		SpeciesTree	06/09/2001	Nearby wetlands
Dark Green Bullsedge, Black Bulrush	Scirpus atrovirens	Grasses, Sedges and Rushes		SpeciesTree	06/01/2002	Montague Road
Wool-grass, Common Bullsedge or Bulrush	Scirpus cyperinus	Grasses, Sedges and Rushes		SpeciesTree	06/08/2001	Wetlands around these two ponds
Water Boatmen	Corixidae	Insects		SpeciesTree	06/08/2001	Wetlands around these two ponds
Water Striders	Gerridae	Insects		SpeciesTree	06/08/2001	Wetlands around these two ponds
Meadow Spittlebug	Philaenus spumarius	Insects		SpeciesTree	06/09/2001	Nearby wetlands
Common British Soldiers	Cladonia cristatella	Lichens		SpeciesTree	06/01/2002	Montague Road

Common British Soldiers	Cladonia cristatella	Lichens		SpeciesTree	05/31/2002	MDC property
Common British Soldiers	Cladonia cristatella	Lichens		SpeciesTree	06/08/2001	Wetlands around these two ponds
Lichens	Symbiosis between Fungi and Algae	Lichens		SpeciesTree	05/31/2002	MDC property
Moose	Alces alces	Mammals		SpeciesTree	05/31/2002	Lake Wyola
Coyote	Canis latrans	Mammals		SpeciesTree	05/31/2002	Lake Wyola
American Beaver	Castor canadensis	Mammals		SpeciesTree	05/31/2002	Lake Wyola
American Beaver	Castor canadensis	Mammals		SpeciesTree	06/01/2002	Montague Road
American Beaver	Castor canadensis	Mammals		SpeciesTree	05/31/2002	MDC property
American Beaver	Castor canadensis	Mammals		SpeciesTree	06/08/2001	Wetlands around these two ponds
Humans	Homo sapiens	Mammals		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
White-tailed Deer	Odocoileus virginianus	Mammals		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
White-tailed Deer	Odocoileus virginianus	Mammals		SpeciesTree	06/08/2001	Wetlands around these two ponds
White-tailed Deer	Odocoileus virginianus	Mammals		SpeciesTree	05/31/2002	MDC property
White-tailed Deer	Odocoileus virginianus	Mammals		SpeciesTree	05/31/2002	Lake Wyola
White-tailed Deer	Odocoileus virginianus	Mammals		SpeciesTree	06/01/2002	Montague Road
Eastern Gray Squirrel	Sciurus carolinensis	Mammals		SpeciesTree	06/08/2001	Roadside Inventory
Eastern Chipmunk	Tamias striatus	Mammals		SpeciesTree	06/08/2001	Roadside Inventory
Eastern Chipmunk	Tamias striatus	Mammals		SpeciesTree	05/31/2002	MDC property
Star Mosses	Mnium	Mosses		SpeciesTree	06/09/2001	Nearby wetlands
Haircap Moss	Polytrichum	Mosses		SpeciesTree	05/31/2002	MDC property
Haircap Moss	Polytrichum	Mosses		SpeciesTree	06/01/2002	Montague Road
Sphagnum Moss, Peat	Sphagnum	Mosses		SpeciesTree	06/01/2002	Montague Road
Sphagnum Moss, Peat	Sphagnum	Mosses		SpeciesTree	06/09/2001	Nearby wetlands
Sphagnum Moss, Peat	Sphagnum	Mosses		SpeciesTree	06/08/2001	Wetlands around these two ponds

A Turkey-tail	Datronia (Trametes) mollis	Mushrooms (Fungi)		SpeciesTree	05/31/2002	Lake Wyola
Hemlock Polypore, Varnish-shelf	Ganoderma tsugae	Mushrooms (Fungi)		SpeciesTree	05/31/2002	MDC property
Painted Turtle	Chrysemys picta	Reptiles		SpeciesTree	05/31/2002	Lake Wyola
Spotted Turtle	Clemmys guttata	Reptiles	Special Concern	SpeciesTree	06/01/2002	
Spotted Turtle	Clemmys guttata	Reptiles	Special Concern	SpeciesTree	05/31/2002	
Northern Water Snake	Nerodia sipedon	Reptiles		SpeciesTree	05/31/2002	MDC property
Northern Water Snake	Nerodia sipedon	Reptiles		SpeciesTree	06/01/2002	Montague Road
Brown Dog Tick, Wood Tick	Dermacentor variabilis	Spiders and Ticks		SpeciesTree	05/31/2002	MDC property
Balsam-fir	Abies balsamea	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Black Maple	Acer nigrum	Trees and Shrubs	Special Concern	SpeciesTree	06/09/2001	
Striped Maple, Moosewood	Acer pensylvanicum	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Red Maple	Acer rubrum	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Red Maple	Acer rubrum	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
Red Maple	Acer rubrum	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Red Maple	Acer rubrum	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Sugar-maple	Acer saccharum	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Sugar-maple	Acer saccharum	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Mountain-maple	Acer spicatum	Trees and Shrubs		SpeciesTree	06/08/2001	Wetlands around these two ponds
Mountain-maple	Acer spicatum	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Speckled Alder	Alnus incana	Trees and Shrubs		SpeciesTree	06/08/2001	Wetlands around these two ponds
Speckled Alder	Alnus incana	Trees and Shrubs		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Speckled Alder	Alnus incana	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Speckled Alder	Alnus incana	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road

Speckled Alder	Alnus incana	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Black Chokeberry	Aronia melanocarpa	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Black Chokeberry	Aronia melanocarpa	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Black Chokeberry	Aronia melanocarpa	Trees and Shrubs		SpeciesTree	06/08/2001	Wetlands around these two ponds
Japanese Barberry	Berberis thunbergii	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Japanese Barberry	Berberis thunbergii	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Japanese Barberry	Berberis thunbergii	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Japanese Barberry	Berberis thunbergii	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Yellow Birch	Betula alleghaniensis	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Yellow Birch	Betula alleghaniensis	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Yellow Birch	Betula alleghaniensis	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Black Birch, Sweet Birch, Cherry-birch	Betula lenta	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Paper-birch, Canoe-birch	Betula papyrifera	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Gray Birch	Betula populifolia	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Gray Birch	Betula populifolia	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
Gray Birch	Betula populifolia	Trees and Shrubs		SpeciesTree	06/08/2001	Wetlands around these two ponds
Downy Birch, White Birch	Betula pubescens	Trees and Shrubs		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Ironwood, Musclewood, Blue Beech, Hornbeam	Carpinus caroliniana	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Mockernut Hickory, White-hearted Hickory	Carya alba	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Bitternut-hickory, Swamp-hickory	Carya cordiformis	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Pignut, Pignut-hickory	Carya glabra	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property

Shagbark-hickory	Carya ovata	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Shagbark-hickory	Carya ovata	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
American Chestnut	Castanea dentata	Trees and Shrubs		SpeciesTree	06/08/2001	Wetlands around these two ponds
American Chestnut	Castanea dentata	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
American Chestnut	Castanea dentata	Trees and Shrubs		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
American Chestnut	Castanea dentata	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
American Chestnut	Castanea dentata	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Atlantic White Cedar	Chamaecyparis thyoides	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Virgin's Bower, Devil's Darning Needle	Clematis virginiana	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Virgin's Bower, Devil's Darning Needle	Clematis virginiana	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Sweet Fern	Comptonia peregrina	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Sweet Fern	Comptonia peregrina	Trees and Shrubs		SpeciesTree	05/31/2002	Lake Wyola
Silky Dogwood	Cornus amomum	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Bunchberry, Dwarf Cornel	Cornus canadensis	Trees and Shrubs		SpeciesTree	05/31/2002	Lake Wyola
Bunchberry, Dwarf Cornel	Cornus canadensis	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
Bunchberry, Dwarf Cornel	Cornus canadensis	Trees and Shrubs		SpeciesTree	06/08/2001	Wetlands around these two ponds
Bunchberry, Dwarf Cornel	Cornus canadensis	Trees and Shrubs		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Gray Dogwood, White Dogwood, Northern Swamp-dogwood	Cornus racemosa	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands

American Filbert, American Hazelnut	<i>Corylus americana</i>	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Autumn-olive, Oleaster	<i>Elaeagnus umbellata</i>	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
American Beech	<i>Fagus grandifolia</i>	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
American Beech	<i>Fagus grandifolia</i>	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
American Beech	<i>Fagus grandifolia</i>	Trees and Shrubs		SpeciesTree	06/08/2001	Wetlands around these two ponds
White Ash	<i>Fraxinus americana</i>	Trees and Shrubs		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
White Ash	<i>Fraxinus americana</i>	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
White Ash	<i>Fraxinus americana</i>	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Black Ash	<i>Fraxinus nigra</i>	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Red Ash (hairy form); Green Ash (glabrous form)	<i>Fraxinus pennsylvanica</i>	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Wintergreen, Checkerberry, Teaberry, Mountain-tea	<i>Gaultheria procumbens</i>	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Wintergreen, Checkerberry, Teaberry, Mountain-tea	<i>Gaultheria procumbens</i>	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Wintergreen, Checkerberry, Teaberry, Mountain-tea	<i>Gaultheria procumbens</i>	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
Wintergreen, Checkerberry, Teaberry, Mountain-tea	<i>Gaultheria procumbens</i>	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Witch-hazel	<i>Hamamelis virginiana</i>	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Witch-hazel	<i>Hamamelis virginiana</i>	Trees and Shrubs		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Witch-hazel	<i>Hamamelis virginiana</i>	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
Witch-hazel	<i>Hamamelis virginiana</i>	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property

Winterberry, Black Alder	Ilex verticillata	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Butternut, White Walnut	Juglans cinerea	Trees and Shrubs	Watch List	SpeciesTree	05/31/2002	
Black Walnut	Juglans nigra	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Common Juniper, Pasture-juniper	Juniperus communis	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Common Juniper, Pasture-juniper	Juniperus communis	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Common Juniper, Pasture-juniper	Juniperus communis	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Eastern Red Cedar	Juniperus virginiana	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Sheep-laurel, Lambkill, Wicky	Kalmia angustifolia	Trees and Shrubs		SpeciesTree	06/08/2001	Wetlands around these two ponds
Sheep-laurel, Lambkill, Wicky	Kalmia angustifolia	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Sheep-laurel, Lambkill, Wicky	Kalmia angustifolia	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Sheep-laurel, Lambkill, Wicky	Kalmia angustifolia	Trees and Shrubs		SpeciesTree	05/31/2002	Lake Wyola
Sheep-laurel, Lambkill, Wicky	Kalmia angustifolia	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
Mountain- laurel	Kalmia latifolia	Trees and Shrubs		SpeciesTree	05/31/2002	Lake Wyola
Mountain- laurel	Kalmia latifolia	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
Mountain- laurel	Kalmia latifolia	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Mountain- laurel	Kalmia latifolia	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Mountain- laurel	Kalmia latifolia	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Mountain- laurel	Kalmia latifolia	Trees and Shrubs		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Tamarack, American Larch	Larix laricina	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory

Tamarack, American Larch	Larix laricina	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Maleberry, Male Blueberry	Lyonia ligustrina	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
Apple	Malus pumila	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Common Mountain- holly, Catberry	Nemopanthus mucronatus	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Black Gum, Sour Gum, Tupelo, Beetlebung, Pepperidge	Nyssa sylvatica	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Black Gum, Sour Gum, Tupelo, Beetlebung, Pepperidge	Nyssa sylvatica	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Hop-hornbeam, Ironwood	Ostrya virginiana	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
White Spruce	Picea glauca	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Black Spruce	Picea mariana	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Black Spruce	Picea mariana	Trees and Shrubs		SpeciesTree	05/31/2002	Lake Wyola
Black Spruce	Picea mariana	Trees and Shrubs		SpeciesTree	06/08/2001	Wetlands around these two ponds
Red Spruce	Picea rubens	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Red Pine	Pinus resinosa	Trees and Shrubs	Watch List	SpeciesTree	05/31/2002	
Red Pine	Pinus resinosa	Trees and Shrubs	Watch List	SpeciesTree	06/09/2001	
Pitch-pine	Pinus rigida	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
White Pine	Pinus strobus	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
White Pine	Pinus strobus	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
White Pine	Pinus strobus	Trees and Shrubs		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
White Pine	Pinus strobus	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands

White Pine	Pinus strobus	Trees and Shrubs		SpeciesTree	06/08/2001	Wetlands around these two ponds
Sycamore, Buttonwood	Platanus occidentalis	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Cottonwood	Populus deltoides	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Big-toothed Aspen	Populus grandidentata	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Trembling Aspen, Quaking Aspen, Quiver-leaf	Populus tremuloides	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Trembling Aspen, Quaking Aspen, Quiver-leaf	Populus tremuloides	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Fire-cherry, Pin cherry, Bird-cherry	Prunus pensylvanica	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Fire-cherry, Pin cherry, Bird-cherry	Prunus pensylvanica	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Black Cherry, Wild Rum-cherry	Prunus serotina	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Black Cherry, Wild Rum-cherry	Prunus serotina	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Black Cherry, Wild Rum-cherry	Prunus serotina	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Black Cherry, Wild Rum-cherry	Prunus serotina	Trees and Shrubs		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Choke-cherry	Prunus virginiana	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
White Oak	Quercus alba	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
White Oak	Quercus alba	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
White Oak	Quercus alba	Trees and Shrubs		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
White Oak	Quercus alba	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Swamp White Oak	Quercus bicolor	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Scarlet Oak	Quercus coccinea	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property

Scarlet Oak	Quercus coccinea	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Pin-oak	Quercus palustris	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Chestnut-oak, Rock Chestnut-oak	Quercus prinus	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Red Oak	Quercus rubra	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Red Oak	Quercus rubra	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
Red Oak	Quercus rubra	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Red Oak	Quercus rubra	Trees and Shrubs		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Black Oak	Quercus velutina	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Black Oak	Quercus velutina	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Black Oak	Quercus velutina	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Common Buckthorn	Rhamnus cathartica	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Glossy Alder-buckthorn, Smooth Alder-buckthorn, European Alder buckthorn	Rhamnus frangula	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Swamp-azalea, Swamp-honeysuckle	Rhododendron viscosum	Trees and Shrubs		SpeciesTree	05/31/2002	Lake Wyola
Swamp-azalea, Swamp-honeysuckle	Rhododendron viscosum	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Staghorn-sumac	Rhus hirta	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Black Locust	Robinia pseudoacacia	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Black Locust	Robinia pseudoacacia	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Multiflora Rose	Rosa multiflora	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Northern Dewberry, Whip-dewberry	Rubus flagellaris	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands

Northern Dewberry, Whip-dewberry	Rubus flagellaris	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Bristly Dewberry, Running Dewberry, Swamp-dewberry	Rubus hispidus	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
Red Raspberry	Rubus idaeus	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Sassafras	Sassafras albidum	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
American Mountain-ash, Roundwood, Dogberry	Sorbus americana	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
American Mountain-ash, Roundwood, Dogberry	Sorbus americana	Trees and Shrubs		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Meadowsweet	Spiraea alba	Trees and Shrubs		SpeciesTree	06/08/2001	Wetlands around these two ponds
Meadowsweet	Spiraea alba	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Meadowsweet	Spiraea alba	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
Meadowsweet	Spiraea alba var. latifolia	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Meadowsweet	Spiraea alba var. latifolia	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Steeple-bush, Hardhack	Spiraea tomentosa	Trees and Shrubs		SpeciesTree	06/08/2001	Wetlands around these two ponds
Steeple-bush, Hardhack	Spiraea tomentosa	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
American Basswood	Tilia americana	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Poison-ivy, Climbing Poison-ivy	Toxicodendron radicans	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Poison-ivy, Climbing Poison-ivy	Toxicodendron radicans	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Poison-ivy, Climbing Poison-ivy	Toxicodendron radicans	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory

Eastern Hemlock	Tsuga canadensis	Trees and Shrubs		SpeciesTree	06/08/2001	Wetlands around these two ponds
Eastern Hemlock	Tsuga canadensis	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Eastern Hemlock	Tsuga canadensis	Trees and Shrubs		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Eastern Hemlock	Tsuga canadensis	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Eastern Hemlock	Tsuga canadensis	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Eastern Hemlock	Tsuga canadensis	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
American Elm, White Elm	Ulmus americana	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
American Elm, White Elm	Ulmus americana	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Slippery Elm, Red Elm	Ulmus rubra	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Lowbush Blueberry	Vaccinium angustifolium	Trees and Shrubs		SpeciesTree	05/31/2002	MDC property
Lowbush Blueberry	Vaccinium angustifolium	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
Lowbush Blueberry	Vaccinium angustifolium	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Lowbush Blueberry	Vaccinium angustifolium	Trees and Shrubs		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Lowbush Blueberry	Vaccinium angustifolium	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Highbush-blueberry	Vaccinium corymbosum	Trees and Shrubs		SpeciesTree	06/08/2001	Wetlands around these two ponds
Highbush-blueberry	Vaccinium corymbosum	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Highbush-blueberry	Vaccinium corymbosum	Trees and Shrubs		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Highbush-blueberry	Vaccinium corymbosum	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Highbush-blueberry	Vaccinium corymbosum	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
Highbush-blueberry	Vaccinium corymbosum	Trees and Shrubs		SpeciesTree	05/31/2002	Lake Wyola
Large Cranberry, American Cranberry	Vaccinium macrocarpon	Trees and Shrubs		SpeciesTree	05/31/2002	Lake Wyola

Large Cranberry, American Cranberry	Vaccinium macrocarpon	Trees and Shrubs		SpeciesTree	06/08/2001	Wetlands around these two ponds
Small Cranberry, Wren's Egg Cranberry	Vaccinium oxycoccus	Trees and Shrubs		SpeciesTree	05/31/2002	Lake Wyola
Maple-leaf Viburnum, Dockmackie, Flowering Maple	Viburnum acerifolium	Trees and Shrubs		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Arrow-wood Viburnum	Viburnum dentatum	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Arrow-wood Viburnum	Viburnum dentatum	Trees and Shrubs		SpeciesTree	06/01/2002	Montague Road
Northern Arrow-wood, Smooth Arrow-wood	Viburnum dentatum var. lucidum	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Witch-hobble, Hobble-bush, Moosewood, Tanglewood	Viburnum lantanoides	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Witch-hobble, Hobble-bush, Moosewood, Tanglewood	Viburnum lantanoides	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Fox-grape	Vitis labrusca	Trees and Shrubs		SpeciesTree	06/09/2001	Nearby wetlands
Fox-grape	Vitis labrusca	Trees and Shrubs		SpeciesTree	06/08/2001	Roadside Inventory
Common Ragweed	Ambrosia artemisiifolia	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Wood-anemone, Windflower	Anemone quinquefolia	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Wood-anemone, Windflower	Anemone quinquefolia	Wildflowers		SpeciesTree	05/31/2002	MDC property
Wood-anemone, Windflower	Anemone quinquefolia	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Wild Columbine, Red Columbine	Aquilegia canadensis	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Wild Sarsaparilla	Aralia nudicaulis	Wildflowers		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola

Wild Sarsaparilla	Aralia nudicaulis	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Wild Sarsaparilla	Aralia nudicaulis	Wildflowers		SpeciesTree	05/31/2002	MDC property
Wild Sarsaparilla	Aralia nudicaulis	Wildflowers		SpeciesTree	06/01/2002	Montague Road
Wild Sarsaparilla	Aralia nudicaulis	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Common Burdock	Arctium minus	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Jack-in-the-Pulpit	Arisaema triphyllum	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Jack-in-the-Pulpit	Arisaema triphyllum	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Common Milkweed	Asclepias syriaca	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Common Milkweed	Asclepias syriaca	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Asparagus	Asparagus officinalis	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
White Wood-aster	Aster divaricatus	Wildflowers		SpeciesTree	05/31/2002	MDC property
Winter-cress, Yellow Rocket	Barbarea vulgaris	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Hoary Alyssum	Berteroa incana	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Water-shield	Brasenia schreberi	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Pennsylvania Bittercress, Common Bittercress	Cardamine pensylvanica	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Clammy Mouse ear Chickweed, Sticky Mouse-ear Chickweed	Cerastium glomeratum	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Leatherleaf, Cassandra	Chamaedaphne calyculata	Wildflowers		SpeciesTree	05/31/2002	Lake Wyola
Leatherleaf, Cassandra	Chamaedaphne calyculata	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Celandine, Swallow-wort	Chelidonium majus	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Lamb's-quarters, Pigweed	Chenopodium album	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Bluebead-lily, Clintonia, Corn-lily	Clintonia borealis	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands

Bluebead-lily, Clintonia, Corn- lily	Clintonia borealis	Wildflowers		SpeciesTree	05/31/2002	MDC property
Bluebead-lily, Clintonia, Corn- lily	Clintonia borealis	Wildflowers		SpeciesTree	05/31/2002	Lake Wyola
Bluebead-lily, Clintonia, Corn- lily	Clintonia borealis	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Bluebead-lily, Clintonia, Corn- lily	Clintonia borealis	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Goldthread	Coptis trifolia	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Goldthread	Coptis trifolia	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Pink Lady's Slipper, Moccasin- flower	Cypripedium acaule	Wildflowers		SpeciesTree	05/31/2002	Lake Wyola
Pink Lady's Slipper, Moccasin- flower	Cypripedium acaule	Wildflowers		SpeciesTree	06/01/2002	Montague Road
Pink Lady's Slipper, Moccasin- flower	Cypripedium acaule	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Pink Lady's Slipper, Moccasin- flower	Cypripedium acaule	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Queen Anne's Lace, Wild Carrot	Daucus carota	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Spatulate- leaved Sundew	Drosera intermedia	Wildflowers		SpeciesTree	06/01/2002	Montague Road
Spatulate- leaved Sundew	Drosera intermedia	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Round-leaved Sundew	Drosera rotundifolia	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Mayflower, Trailing Arbutus	Epigaea repens	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Philadelphia Fleabane, Pink Fleabane	Erigeron philadelphicus	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory

Boneset, Thoroughwort	Eupatorium perfoliatum	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Wild Geranium, Spotted Crane's Bill	Geranium maculatum	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Wild Geranium, Spotted Crane's Bill	Geranium maculatum	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Gill-over-the-ground, Ground-ivy	Glechoma hederacea	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Orange Day-lily	Hemerocallis fulva	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Orange Hawkweed, Devil's Paintbrush	Hieracium aurantiacum	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Orange Hawkweed, Devil's Paintbrush	Hieracium aurantiacum	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
King-devil, Meadow Hawkweed	Hieracium caespitosum	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
King-devil, Meadow Hawkweed	Hieracium caespitosum	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Bluets, Quaker Ladies, Innocence, Churn-dasher	Houstonia caerulea	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Bluets, Quaker Ladies, Innocence, Churn-dasher	Houstonia caerulea	Wildflowers		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Bluets, Quaker Ladies, Innocence, Churn-dasher	Houstonia caerulea	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Bluets, Quaker Ladies, Innocence, Churn-dasher	Houstonia caerulea	Wildflowers		SpeciesTree	05/31/2002	Lake Wyola

Bluets, Quaker Ladies, Innocence, Churn-dasher	Houstonia caerulea	Wildflowers		SpeciesTree	06/01/2002	Montague Road
Bluets, Quaker Ladies, Innocence, Churn-dasher	Houstonia caerulea	Wildflowers		SpeciesTree	05/31/2002	MDC property
Orange Jewelweed, Spotted Touch-me-not	Impatiens capensis	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Orange Jewelweed, Spotted Touch-me-not	Impatiens capensis	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Northern Blue Flag, Wild Iris, Poison-flag	Iris versicolor	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Northern Blue Flag, Wild Iris, Poison-flag	Iris versicolor	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Oxeye-daisy, Marguerite	Leucanthemum vulgare	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Oxeye-daisy, Marguerite	Leucanthemum vulgare	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Ragged Robin	Lychnis flos-cuculi	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Whorled Loosestrife	Lysimachia quadrifolia	Wildflowers		SpeciesTree	05/31/2002	MDC property
Whorled Loosestrife	Lysimachia quadrifolia	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Canada Mayflower, False Lily-of-the-valley	Maianthemum canadense	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Canada Mayflower, False Lily-of-the-valley	Maianthemum canadense	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Canada Mayflower, False Lily-of-the-valley	Maianthemum canadense	Wildflowers		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Canada Mayflower, False Lily-of-the-valley	Maianthemum canadense	Wildflowers		SpeciesTree	05/31/2002	MDC property

Canada Mayflower, False Lily-of- the-valley	Maianthemum canadense	Wildflowers		SpeciesTree	05/31/2002	Lake Wyola
Canada Mayflower, False Lily-of- the-valley	Maianthemum canadense	Wildflowers		SpeciesTree	06/01/2002	Montague Road
Canada Mayflower, False Lily-of- the-valley	Maianthemum canadense	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
False Solomon's Seal	Maianthemum racemosum	Wildflowers		SpeciesTree	05/31/2002	MDC property
False Solomon's Seal	Maianthemum racemosum	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
False Solomon's Seal	Maianthemum racemosum	Wildflowers		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Indian Cucumber-root	Medeola virginiana	Wildflowers		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Indian Cucumber-root	Medeola virginiana	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Indian Cucumber-root	Medeola virginiana	Wildflowers		SpeciesTree	05/31/2002	MDC property
Indian Cucumber-root	Medeola virginiana	Wildflowers		SpeciesTree	06/01/2002	Montague Road
Indian Cucumber-root	Medeola virginiana	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Partridge-berry, Twinberry, Two-eyed Berry	Mitchella repens	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Partridge-berry, Twinberry, Two-eyed Berry	Mitchella repens	Wildflowers		SpeciesTree	05/31/2002	Lake Wyola
Partridge-berry, Twinberry, Two-eyed Berry	Mitchella repens	Wildflowers		SpeciesTree	05/31/2002	MDC property

Partridge-berry , Twinberry , Two-eyed Berry	Mitchella repens	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Indian Pipe	Monotropa uniflora	Wildflowers		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Tiny Cowlily	Nuphar microphylla	Wildflowers	Endangered	SpeciesTree	05/31/2002	
Yellow Water-lily, Bullhead-lily, Spatterdock	Nuphar variegata	Wildflowers		SpeciesTree	05/31/2002	Lake Wyola
Yellow Water-lily, Bullhead-lily, Spatterdock	Nuphar variegata	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Fragrant Water-lily	Nymphaea odorata	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
One-flowered Cancer-root	Orobanche uniflora	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Common Yellow Wood-sorrel	Oxalis stricta	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Common Yellow Wood-sorrel	Oxalis stricta	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Dwarf Ginseng	Panax trifolius	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Virginia Creeper , Woodbine	Parthenocissus quinquefolia	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Broad-leaf Plantain , Common Plantain	Plantago major	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Broad-leaf Plantain , Common Plantain	Plantago major	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Common Plantain , Dooryard Plantain , White Man's Foot	Plantago major var. major	Wildflowers		SpeciesTree	05/31/2002	MDC property

Fringed Polygala, Gaywings, Flowering Wintergreen	<i>Polygala paucifolia</i>	Wildflowers		SpeciesTree	05/31/2002	MDC property
Fringed Polygala, Gaywings, Flowering Wintergreen	<i>Polygala paucifolia</i>	Wildflowers		SpeciesTree	05/31/2002	Lake Wyola
Solomon's Seal	<i>Polygonatum pubescens</i>	Wildflowers		SpeciesTree	05/31/2002	MDC property
Japanese Knotweed, Japanese Bamboo	<i>Polygonum cuspidatum</i>	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Dwarf Cinquefoil, Running Five-fingers	<i>Potentilla canadensis</i>	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Old Field Cinquefoil, Old Field Five-fingers	<i>Potentilla simplex</i>	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Old Field Cinquefoil, Old Field Five-fingers	<i>Potentilla simplex</i>	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Old Field Cinquefoil, Old Field Five-fingers	<i>Potentilla simplex</i>	Wildflowers		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Glossy Shinleaf, Round-leaved Shinleaf, Glossy Pyrola, Round-leaved Pyrola	<i>Pyrola americana</i>	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Tall Buttercup, Common Buttercup, Meadow-buttercup	<i>Ranunculus acris</i>	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Tall Buttercup, Common Buttercup, Meadow-buttercup	<i>Ranunculus acris</i>	Wildflowers		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola

Tall Buttercup, Common Buttercup, Meadow- buttercup	Ranunculus acris	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Red Sorrel, Sheep Sorrel	Rumex acetosella	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Red Sorrel, Sheep Sorrel	Rumex acetosella	Wildflowers		SpeciesTree	05/31/2002	MDC property
Red Sorrel, Sheep Sorrel	Rumex acetosella	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Curly Dock, Sour Dock	Rumex crispus	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Broad-leaved Arrowhead, Duck-potato	Sagittaria latifolia	Wildflowers		SpeciesTree	06/01/2002	Montague Road
Pitcher-plant	Sarracenia purpurea	Wildflowers		SpeciesTree	06/01/2002	Montague Road
Pitcher-plant	Sarracenia purpurea	Wildflowers		SpeciesTree	05/31/2002	Lake Wyola
Pitcher-plant	Sarracenia purpurea	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Live-forever, Orpine	Sedum telephium	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Bladder- campion	Silene vulgaris	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Common Blue- eyed Grass	Sisyrinchium montanum	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Common Stitchwort, Meadow-- stitchwort, Field-stitchwort	Stellaria graminea	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Skunk-cabbage	Symplocarpus foetidus	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Common Dandelion	Taraxacum officinale	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Common Dandelion	Taraxacum officinale	Wildflowers		SpeciesTree	05/31/2002	MDC property
Common Dandelion	Taraxacum officinale	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Tall Meadow- rue	Thalictrum pubescens	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Marsh St. John's-wort, Pink St. John's- wort	Triadenum virginicum	Wildflowers		SpeciesTree	06/01/2002	Montague Road
Starflower	Trientalis borealis	Wildflowers		SpeciesTree	05/31/2002	Lake Wyola

Starflower	Trientalis borealis	Wildflowers		SpeciesTree	06/01/2002	Montague Road
Starflower	Trientalis borealis	Wildflowers		SpeciesTree	05/31/2002	MDC property
Starflower	Trientalis borealis	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Starflower	Trientalis borealis	Wildflowers		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Starflower	Trientalis borealis	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Starflower	Trientalis borealis	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Little Hop- clover	Trifolium dubium	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Red Clover	Trifolium pratense	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Red Clover	Trifolium pratense	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Red Clover	Trifolium pratense	Wildflowers		SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
White Clover	Trifolium repens	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Red or Purple Trillium, Wakerobin, Stinking Benjamin	Trillium erectum	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Painted Trillium	Trillium undulatum	Wildflowers		SpeciesTree	05/31/2002	Lake Wyola
Painted Trillium	Trillium undulatum	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Broad-leaved or Common Cat-tail	Typha latifolia	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Broad-leaved or Common Cat-tail	Typha latifolia	Wildflowers		SpeciesTree	06/01/2002	Montague Road
Wild Oats, Little Merrybells (Sessile-leaf Bellwort)	Uvularia sessilifolia	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Wild Oats, Little Merrybells (Sessile-leaf Bellwort)	Uvularia sessilifolia	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory

False Hellebore, Indian Poke	Veratrum viride	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
False Hellebore, Indian Poke	Veratrum viride	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Common Mullein, Common Flannel-plant	Verbascum thapsus	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Bird-vetch, Cow-vetch, Tufted Vetch	Vicia cracca	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Bird-vetch, Cow-vetch, Tufted Vetch	Vicia cracca	Wildflowers		SpeciesTree	06/08/2001	Roadside Inventory
Common Vetch, Spring Vetch	Vicia sativa	Wildflowers		SpeciesTree	05/31/2002	MDC property
Lance-leaf Violet	Viola lanceolata	Wildflowers		SpeciesTree	06/08/2001	Wetlands around these two ponds
Primrose-leaf Violet	Viola x primulifolia	Wildflowers		SpeciesTree	05/31/2002	Lake Wyola
Golden Alexanders	Zizia aurea	Wildflowers		SpeciesTree	05/31/2002	MDC property
Golden Alexanders	Zizia aurea	Wildflowers		SpeciesTree	06/09/2001	Nearby wetlands
Yarrow	Achillea			SpeciesTree	06/09/2001	Nearby wetlands
Yarrow	Achillea			SpeciesTree	06/08/2001	Roadside Inventory
N/A	Ambystoma			SpeciesTree	06/10/2001	Nearby area
Serviceberry/S hadbush Genus	Amelanchier			SpeciesTree	05/31/2002	MDC property
Dogbane Genus	Apocynum			SpeciesTree	06/08/2001	Roadside Inventory
N/A	Clintonia			SpeciesTree	05/31/2002	Lake Wyola
Hawthorn Genus	Crataegus			SpeciesTree	05/31/2002	MDC property
Hawthorn Genus	Crataegus			SpeciesTree	06/09/2001	Nearby wetlands
Sundews	Droseraceae			SpeciesTree	05/31/2002	Lake Wyola
Wood-fern Genus	Dryopteris			SpeciesTree	05/31/2002	MDC property
N/A	Eleocharis			SpeciesTree	06/08/2001	Wetlands around these two ponds
Horsetail Genus	Equisetum			SpeciesTree	06/09/2001	Nearby wetlands

N/A	Esox			SpeciesTree	06/08/2001	Wetlands around these two ponds
Strawberry Genus	Fragaria			SpeciesTree	06/08/2001	Roadside Inventory
Strawberry Genus	Fragaria			SpeciesTree	06/09/2001	Nearby wetlands
Bedstraw Genus	Galium			SpeciesTree	06/09/2001	Nearby wetlands
Hawkweed Genus	Hieracium			SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Swallows	Hirundinidae			SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
St. John's-wort Genus	Hypericum			SpeciesTree	06/08/2001	Wetlands around these two ponds
St. John's-wort Genus	Hypericum			SpeciesTree	06/09/2001	Nearby wetlands
Iris Genus	Iris			SpeciesTree	05/31/2002	MDC property
Honeysuckle Genus	Lonicera			SpeciesTree	05/31/2002	MDC property
Honeysuckle Genus	Lonicera			SpeciesTree	06/09/2001	Nearby wetlands
Clubmosses	Lycopodiaceae			SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Water-horehound Genus	Lycopus			SpeciesTree	06/09/2001	Nearby wetlands
Forget-me-not Genus	Myosotis			SpeciesTree	06/09/2001	Nearby wetlands
Forget-me-not Genus	Myosotis			SpeciesTree	06/08/2001	Roadside Inventory
Water-lilies	Nymphaeaceae			SpeciesTree	05/31/2002	Lake Wyola
Wood-sorrels, Oxalis or Sheep-sorrels	Oxalidaceae			SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Swallowtails	Papilionidae			SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
N/A	Polygonatum			SpeciesTree	05/31/2002	Lake Wyola
Knotweed/Smartweed Genus	Polygonum			SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Cinquefoil Genus	Potentilla			SpeciesTree	05/31/2002	MDC property
Cinquefoil Genus	Potentilla			SpeciesTree	05/31/2002	Lake Wyola
Rattlesnake Root Genus	Prenanthes			SpeciesTree	06/09/2001	Nearby wetlands

Wintergreens	Pyrolaceae			SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Rose Genus	Rosa			SpeciesTree	06/09/2001	Nearby wetlands
Blackberry/De wberry Genus	Rubus			SpeciesTree	06/09/2001	Nearby wetlands
Willow Genus	Salix			SpeciesTree	06/01/2002	Montague Road
Pitcher-plants	Sarraceniaceae			SpeciesTree	05/31/2002	Lake Wyola
Scorpionfishes & Sculpins	Scorpaeniformes			SpeciesTree	06/09/2001	Nearby wetlands
N/A	Sedum			SpeciesTree	05/31/2002	MDC property
Goldenrod Genus	Solidago			SpeciesTree	05/31/2002	MDC property
Goldenrod Genus	Solidago			SpeciesTree	06/09/2001	Nearby wetlands
Goldenrod Genus	Solidago			SpeciesTree	06/01/2002	Montague Road
Goldenrod Genus	Solidago			SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Shrews	Soricidae			SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Trillium Genus	Trillium			SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Trillium Genus	Trillium			SpeciesTree	06/01/2002	Montague Road
Bladderwort Genus	Utricularia			SpeciesTree	06/08/2001	Wetlands around these two ponds
Blueberry Genus	Vaccinium			SpeciesTree	05/31/2002	Lake Wyola
Viburnum Genus	Viburnum			SpeciesTree	06/10/2001	Watershed upstream of Lake Wyola
Violet Genus	Viola			SpeciesTree	06/08/2001	Roadside Inventory
Violet Genus	Viola			SpeciesTree	06/01/2002	Montague Road
Violets	Violaceae			SpeciesTree	05/31/2002	MDC property
Violets	Violaceae			SpeciesTree	05/31/2002	Lake Wyola

APPENDIX C
ECONOMIC DEVELOPMENT

APPENDIX C

Appendix Table 2-1: Total Population from 1970, 1980, 1990 and 2000

Geography	1970 Population	1980 Population	1990 Population *	2000 Population
Shutesbury	489	1,049	1,561	1,810
Amherst	26,331	33,229	35,228	34,874
Leverett	1,005	1,471	1,785	1,663
New Salem	474	688	802	929
Pelham	937	1,112	1,373	1,403
Wendell	405	694	899	986
Franklin County	59,233	64,317	70,092	71,535
Hampshire County	123,997	138,813	146,568	152,251
Massachusetts	5,689,377	5,737,037	6,016,425	6,349,097

Source: U.S. Census Bureau – 1970 Census, 1980 Census, 1990 Census and 2000 Census

* Please note that there is a discrepancy between the Town Census population figure and the U.S. Census Bureau 1990 population figure. Town officials have noted that U.S. Census Bureau 1990 population is lower than the Town Census population.

Appendix Table 2-2: Population Change from 1970 to 2000

Geography	1970-1980 Change	1980-1990 Change	1990-2000 Change	1970-2000 Change
Shutesbury	114.5%	48.8%	16.0%	270.1%
Amherst	26.2%	6.0%	-1.0%	32.4%
Leverett	46.4%	21.3%	-6.8%	65.5%
New Salem	45.1%	16.6%	15.8%	96.0%
Pelham	18.7%	23.5%	2.2%	49.7%
Wendell	71.4%	29.5%	9.7%	143.5%
Franklin County	8.6%	9.0%	2.1%	20.8%
Hampshire County	11.9%	5.6%	3.9%	22.8%
Massachusetts	0.8%	4.9%	5.5%	11.6%

Source: U.S. Census Bureau – 1970 Census, 1980 Census, 1990 Census and 2000 Census

Appendix Table 2-3: Age Distribution in 1990 and 2000

Geography	9 Years & Under	10 - 19 Years	20 - 24 Years	25 - 44 Years	45 - 64 Years	65 - 74 Years	75 Years & Over
Shutesbury							
1990	297	175	78	718	200	55	39
2000	223	328	73	524	558	61	43
% Change	-24.9%	87.4%	-6.4%	-27.0%	179.0%	10.9%	10.3%
Amherst							
1990	2,475	8,863	11,604	7,414	3,093	941	838
2000	2,201	8,936	10,768	5,997	4,658	1,139	1,175
% Change	-11.1%	0.8%	-7.2%	-19.1%	50.6%	21.0%	40.2%
Leverett							
1990	243	207	115	684	375	92	69
2000	168	252	97	367	593	106	80
% Change	-30.9%	21.7%	-15.7%	-46.3%	58.1%	15.2%	15.9%
New Salem							
1990	92	122	32	296	131	53	45
2000	112	126	19	275	305	48	44
% Change	21.7%	3.3%	-40.6%	-7.1%	132.8%	-9.4%	-2.2%
Pelham							
1990	188	170	84	498	306	79	48
2000	146	206	82	343	451	104	71
% Change	-22.3%	21.2%	-2.4%	-31.1%	47.4%	31.6%	47.9%
Wendell							
1990	124	160	30	404	138	21	22
2000	110	170	45	302	314	24	21
% Change	-11.3%	6.3%	50.0%	-25.2%	127.5%	14.3%	-4.5%
Franklin County							
1990	10,196	8,819	4,518	23,959	12,429	5,741	4,430
2000	8,247	10,255	3,897	20,406	18,550	4,781	5,399
% Change	-19.1%	16.3%	-13.7%	-14.8%	49.2%	-16.7%	21.9%
Hampshire County							
1990	16,309	23,485	21,311	46,089	22,392	9,906	7,076
2000	15,271	25,235	18,716	40,852	33,850	8,742	9,585
% Change	-6.4%	7.5%	-12.2%	-11.4%	51.2%	-11.8%	35.5%
Massachusetts							
1990	789,195	756,968	508,039	2,021,191	1,121,105	464,131	355,796
2000	828,129	846,984	404,279	1,989,783	1,419,760	427,830	432,332
% Change	4.9%	11.9%	-20.4%	-1.6%	26.6%	-7.8%	21.5%

Source: U.S. Census Bureau – 1990 Census STF3A and 2000 Census SF3

Appendix Table 2-4: Highest Educational Attainment Level in 1990 and 2000*

Geography	Population 25 years and over	% Less than High School Graduate	% High School Graduate	% Some College	% Associate Degree	% Bachelor Degree	% Graduate Degree
Shutesbury							
1990	1,012	6.4%	15.7%	14.3%	5.3%	29.8%	28.4%
2000	1,184	2.5%	14.7%	14.2%	5.9%	24.6%	38.1%
Amherst							
1990	12,286	6.3%	9.7%	13.1%	4.7%	26.7%	39.5%
2000	12,926	4.9%	9.4%	11.4%	5.5%	27.0%	41.7%
Leverett							
1990	1,220	9.3%	15.2%	13.6%	6.4%	20.4%	35.3%
2000	1,141	5.6%	12.8%	11.8%	4.7%	21.7%	43.3%
New Salem							
1990	555	13.7%	32.6%	14.6%	6.3%	19.5%	13.3%
2000	673	8.0%	24.7%	21.2%	6.5%	24.5%	15.0%
Pelham							
1990	931	10.3%	18.5%	13.7%	4.1%	22.0%	31.4%
2000	965	5.5%	16.5%	12.4%	4.8%	22.5%	38.3%
Wendell							
1990	585	13.3%	27.0%	20.5%	6.8%	22.2%	10.1%
2000	642	7.9%	25.1%	19.0%	6.9%	23.8%	17.3%
Franklin County							
1990	46,559	17.6%	33.2%	16.9%	8.0%	14.5%	9.8%
2000	49,121	12.0%	31.2%	19.0%	8.6%	16.2%	12.9%
Hampshire County							
1990	85,463	17.0%	27.2%	15.8%	8.1%	16.6%	15.3%
2000	93,193	10.6%	25.8%	17.5%	8.1%	19.3%	18.6%
Massachusetts							
1990	3,962,223	20.0%	29.7%	15.8%	7.2%	16.6%	10.6%
2000	4,273,275	15.2%	27.3%	17.1%	7.2%	19.5%	13.7%

* All data is for persons 25 years and over.

Source: U.S. Census Bureau – 1990 Census STF3A and 2000 Census SF3

Appendix Table 2-6: Selected 2000 Income and Poverty Statistics

Geography	Per Capita Income in 1999	Median Household Income in 1999	Individuals Below Poverty Level*
Shutesbury	\$26,260	\$60,438	3.8%
Amherst	\$17,427	\$40,017	20.2%
Leverett	\$31,891	\$63,203	5.4%
New Salem	\$23,234	\$48,688	6.3%
Pelham	\$29,821	\$61,339	4.9%
Wendell	\$19,701	\$43,846	10.2%
Franklin County	\$20,672	\$40,768	9.4%
Hampshire County	\$21,685	\$46,098	9.4%
Massachusetts	\$25,952	\$50,502	9.3%

* For whom poverty status was determined.

Please note that income data was reported for the previous year, in this case 1999, of when the Census survey was taken.

Source: U.S. Census Bureau – 2000 Census SF3

Appendix Table 2-7: Worker Commute Patterns 1990 and 2000

Geography	Total Workers*	Worked in Town of Residence	Worked out of Town but in County of Residence	Worked out of County but in State of Residence	Worked out of State of Residence
Shutesbury					
1990	824	12.3%	14.6%	71.2%	1.9%
2000	1,047	14.9%	18.3%	65.1%	1.6%
Amherst**					
1990	17,216	72.2%	11.8%	14.9%	1.1%
2000	17,851	66.2%	16.7%	14.8%	2.3%
Leverett***					
1990	1,017	17.4%	17.5%	62.6%	2.5%
2000	933	19.4%	14.4%	63.8%	2.5%
New Salem					
1990	418	17.9%	27.5%	52.2%	2.4%
2000	521	17.5%	25.3%	55.3%	1.9%
Pelham**					
1990	794	5.9%	70.0%	20.8%	3.3%
2000	791	11.1%	65.1%	20.1%	3.7%
Wendell					
1990	474	17.9%	43.0%	37.8%	1.3%
2000	578	17.6%	41.9%	38.1%	2.4%
Franklin County					
1990	34,674	35.8%	35.8%	24.9%	3.4%
2000	37,053	27.6%	34.9%	33.4%	4.1%
Hampshire County					
1990	75,478	43.8%	22.8%	30.9%	2.5%
2000	81,424	37.8%	25.7%	33.1%	3.4%
Massachusetts					
1990	2,979,594	36.5%	35.9%	24.5%	3.1%
2000	3,102,837	31.3%	35.4%	30.1%	3.3%

* Employed workers 16 years and over.

** Please note that the Towns of Amherst and Pelham are in Hampshire County, not Franklin County.

*** The Town of Leverett is in the process of challenging their Census 2000 figures, due to the possibility that households in Leverett were attributed to the Town of Amherst.

Source: U.S. Census Bureau – 1990 Census STF3A and 2000 Census SF3

Appendix Table 2-8: Travel Time to Work in 1990 and 2000

Geography	Total Workers*	Work at home	Less than 10 Min.	10 - 19 Min.	20 - 29 Min.	30 - 39 Min.	40 - 59 Min.	60 - 89 Min.	90 or More Min.
Shutesbury									
1990	824	6.2%	4.0%	24.3%	31.3%	16.0%	11.2%	5.2%	1.8%
2000	1,047	9.0%	5.0%	21.5%	25.8%	20.2%	11.1%	4.3%	3.2%
Amherst									
1990	17,216	4.6%	32.4%	39.0%	10.4%	7.4%	3.8%	1.5%	0.8%
2000	17,851	5.3%	28.4%	35.4%	12.6%	8.8%	5.7%	2.1%	1.8%
Leverett									
1990	1,017	9.5%	7.7%	35.7%	26.5%	9.8%	7.4%	2.6%	0.9%
2000	933	11.3%	6.5%	35.0%	22.4%	12.8%	6.2%	3.1%	2.7%
New Salem									
1990	418	5.7%	12.2%	30.6%	17.5%	16.0%	12.0%	3.6%	2.4%
2000	521	8.1%	6.7%	24.0%	14.4%	17.3%	15.4%	9.0%	5.2%
Pelham									
1990	794	3.1%	7.3%	47.4%	15.0%	13.5%	10.2%	2.4%	1.1%
2000	791	7.0%	9.7%	41.3%	11.8%	15.4%	11.1%	2.4%	1.3%
Wendell									
1990	328	9.5%	7.6%	18.6%	22.6%	22.6%	10.4%	3.7%	5.2%
2000	578	9.9%	9.7%	13.3%	22.8%	22.5%	10.4%	8.5%	2.9%
Franklin County									
1990	34,674	4.7%	21.8%	32.1%	17.8%	11.5%	7.7%	3.2%	1.1%
2000	37,053	5.1%	16.3%	30.0%	19.1%	14.2%	9.7%	3.3%	2.3%
Hampshire County									
1990	75,478	3.5%	23.6%	32.9%	18.2%	12.7%	6.4%	2.1%	0.7%
2000	81,424	4.1%	19.5%	29.7%	19.8%	14.1%	8.1%	2.8%	1.8%
Massachusetts									
1990	2,979,594	2.5%	15.6%	31.3%	18.7%	15.5%	10.7%	4.7%	1.0%
2000	3,102,837	3.1%	12.6%	27.4%	18.6%	16.3%	13.0%	6.5%	2.4%

* Employed workers 16 years and over.

Source: U.S. Census Bureau – 1990 Census STF3A and 2000 Census SF3

Appendix Table 2-9: Selected Labor Force Characteristics

Geography	Population 16 Years and Over	Labor Force (Civilian)	Total Employed	Unemploy- ment rate	Participation Rate	Female Participation Rate
Shutesbury						
1990	1,142	891	866	2.8%	78.0%	72.0%
2000	1,359	1,105	1,075	2.7%	81.3%	77.3%
% Change/Difference*	19.0%	24.0%	24.1%	-0.1%	3.3%	5.3%
Amherst						
1990	31,424	18,481	17,526	5.4%	58.8%	58.9%
2000	31,078	20,090	18,433	9.0%	59.3%	59.8%
% Change/Difference*	-1.1%	8.7%	5.2%	3.6%	0.5%	0.9%
Leverett						
1990	1,403	1,102	1,036	6.4%	78.5%	73.5%
2000	1,314	985	943	4.5%	71.8%	67.5%
% Change/Difference*	-6.3%	-10.6%	-9.0%	-1.9%	-6.7%	-6.0%
New Salem						
1990	639	460	431	6.7%	72.0%	65.6%
2000	734	553	531	4.1%	72.3%	64.9%
% Change/Difference*	14.9%	20.2%	23.2%	-2.6%	0.3%	-0.7%
Pelham						
1990	1,082	835	805	3.7%	77.2%	75.8%
2000	1,127	829	803	3.2%	71.3%	69.6%
% Change/Difference*	4.2%	-0.7%	-0.2%	-0.5%	-5.9%	-6.2%
Wendell						
1990	669	531	486	9.3%	79.4%	77.8%
2000	767	614	585	5.0%	76.3%	83.3%
% Change/Difference*	14.6%	15.6%	20.4%	-4.3%	-3.1%	5.5%
Franklin County						
1990	54,597	37,723	35,245	6.6%	69.1%	62.1%
2000	56,950	39,357	37,577	4.5%	69.1%	64.4%
% Change/Difference*	4.3%	4.3%	6.6%	-2.1%	0.0%	2.3%
Hampshire County						
1990	121,153	81,153	76,948	5.5%	67.0%	62.5%
2000	126,209	87,297	82,826	5.4%	65.6%	65.8%
% Change/Difference*	4.2%	7.6%	7.6%	-1.4%	0.2%	3.3%
Massachusetts						
1990	4,809,772	3,245,950	3,027,950	6.7%	67.5%	60.3%
2000	5,010,241	3,312,039	3,161,087	4.6%	66.1%	60.4%
% Change/Difference*	4.2%	2.0%	4.4%	-2.1%	-1.4%	0.1%

Source: U.S. Census Bureau – 1990 Census STF3A and 2000 Census SF3

* The percent change from 1990 to 2000 is indicated for the population 16 years and over, the labor force and total employed. The difference in the percentage rates from 1990 to 2000 is indicated for the unemployment rate, participation rate and female participation rate.

Appendix Table 2-11: 2000 Class of Worker

Geography	Total Employed *	Private Wage and Salary Workers	Government Workers	Self-employed Workers**	Unpaid Family Workers ***
Shutesbury	1,075	49.2%	34.0%	16.6%	0.2%
Amherst	18,433	57.8%	36.5%	5.6%	0.1%
Leverett	949943	48.7%	35.4%	15.2%	0.7%
New Salem	531	60.3%	26.4%	12.8%	0.6%
Pelham	803	53.2%	35.5%	11.1%	0.2%
Wendell	585	58.6%	22.9%	18.1%	0.3%
Franklin County	37,577	70.5%	19.3%	9.8%	0.3%
Hampshire County	82,826	69.4%	22.9%	7.6%	0.1%
Massachusetts	3,161,087	80.0%	13.5%	6.4%	0.2%

*Employed Civilian Population 16 years of age and over.

** Self-employed workers in own, non-incorporated business.

*** Unpaid family workers are individuals who work 15 or more hours without pay in a business or on a farm operated by a relative

Source: U.S. Census Bureau – 2000 Census SF3

Appendix Table 2-12: Employment by Sector in 2000

Employment Sector	Shutesbury	Franklin County	Hampshire County	Massachusetts
Educational, Health & Social Services	46.4%	30.4%	38.0%	23.7%
Professional, Scientific, Management, & Administrative Services	8.4%	6.4%	6.8%	11.6%
Retail Trade	6.2%	11.0%	9.9%	11.2%
Arts, Entertainment, Recreation, Accommodation & Food Services	6.0%	6.5%	7.8%	6.8%
Public Administration	5.8%	4.4%	4.3%	4.3%
Construction	5.4%	6.0%	4.2%	5.5%
Manufacturing	4.8%	15.0%	10.3%	12.8%
Other Services (except Public Administration)	4.8%	4.8%	4.2%	4.4%
Finance, Insurance, & Real Estate	3.9%	4.1%	4.7%	8.2%
Information Services	3.7%	2.6%	2.9%	3.7%
Wholesale Trade	2.1%	2.8%	2.4%	3.3%
Transportation, Warehousing & Utilities	1.7%	4.2%	3.7%	4.2%
Agriculture, Forestry, Fishing, Hunting, & Mining	0.7%	1.8%	0.8%	0.4%
Total Employed*	1,075	37,577	82,826	3,161,087

*Employed Civilian Population 16 years of age and over.

Source: U.S. Census Bureau – 2000 Census SF3

Appendix Table 2-13: Selected Municipal Tax Information

Municipality	Fiscal Year	Total Assessed Value	Number of Parcels	Average Assessed Value	Tax Rate (per \$1,000)	Average Single Family Tax Bill	High to Low Rank*	State Median Single Family Tax Bill
Shutesbury								
	1998	\$96,823,300	728	\$132,999	\$21.36	\$2,841	76 of 340	\$2,121
	1999	\$96,756,300	732	\$132,181	\$21.29	\$2,814	90 of 340	\$2,191
	2000	\$100,230,300	747	\$134,177	\$22.19	\$2,977	87 of 340	\$2,297
	2001	\$103,177,000	751	\$137,386	\$22.19	\$3,049	94 of 340	\$2,418
	2002	\$120,010,900	753	\$159,377	\$19.97	\$3,183	99 of 340	\$2,577
Amherst								
	1998	\$621,244,900	3,796	\$163,658	\$19.20	\$3,142	56 of 340	\$2,121
	1999	\$631,164,000	3,826	\$164,967	\$19.98	\$3,296	55 of 340	\$2,191
	2000	\$695,482,300	3,851	\$180,598	\$19.67	\$3,552	52 of 340	\$2,297
	2001	\$711,727,600	3,876	\$183,624	\$19.66	\$3,610	57 of 340	\$2,418
	2002	\$772,660,900	3,900	\$198,118	\$19.00	\$3,764	61 of 340	\$2,577
Leverett								
	1998	\$89,958,800	617	\$145,800	\$20.43	\$2,979	63 of 340	\$2,121
	1999	\$90,997,100	623	\$146,063	\$20.97	\$3,063	71 of 340	\$2,191
	2000	\$108,712,300	622	\$174,779	\$18.52	\$3,237	67 of 340	\$2,297
	2001	\$110,907,500	630	\$176,044	\$19.59	\$3,449	68 of 340	\$2,418
	2002	\$112,922,000	638	\$176,994	\$20.59	\$3,644	70 of 340	\$2,577
New Salem								
	1998	\$45,215,890	402	\$112,477	\$13.50	\$1,518	294 of 340	\$2,121
	1999	\$45,779,600	406	\$112,758	\$13.80	\$1,556	297 of 340	\$2,191
	2000	\$41,333,500	368	\$112,319	\$14.20	\$1,595	299 of 340	\$2,297
	2001	\$41,731,300	369	\$113,093	\$14.60	\$1,651	304 of 340	\$2,418
	2002	\$42,919,300	381	\$112,649	\$15.90	\$1,791	299 of 340	\$2,577
Pelham								
	1998	\$64,797,900	431	\$150,343	\$19.42	\$2,920	70 of 340	\$2,121
	1999	\$70,302,600	439	\$160,143	\$19.44	\$3,113	66 of 340	\$2,191
	2000	\$70,405,400	437	\$161,111	\$20.40	\$3,287	64 of 340	\$2,297
	2001	\$70,917,200	438	\$161,911	\$20.71	\$3,353	77 of 340	\$2,418
	2002	\$80,351,300	437	\$183,870	\$19.97	\$3,672	65 of 340	\$2,577
Wendell								
	1998	\$25,143,000	312	\$80,587	\$20.50	\$1,652	266 of 340	\$2,121
	1999	\$25,711,200	318	\$80,853	\$20.97	\$1,695	262 of 340	\$2,191
	2000	\$27,970,300	316	\$88,514	\$20.15	\$1,784	261 of 340	\$2,297
	2001	\$28,501,400	318	\$89,627	\$21.08	\$1,889	259 of 340	\$2,418
	2002	\$29,254,000	324	\$90,290	\$22.98	\$2,075	256 of 340	\$2,577

* High to low rank of the municipalities ranked. There are 351 municipalities in Massachusetts.
 Source: Massachusetts Department of Revenue – Division of Local Services; April 2002

APPENDIX C: Economic Development and Business Assistance Resources

Organization: Center for Economic Development - UMASS

Address: 109 Hills North, UMASS, Amherst, MA 01003

Telephone: (413) 545-6628

Website: www.umass.edu/larp/CED

Description: CED offers technical assistance to conduct workshops or complete economic development plans. In addition, applied research projects services are available as well as training for municipal board members.

Type of Organization: Government

Organization: Cooperative Development Institute

Address: 277 Federal Street, Greenfield, MA 01301

Telephone: (413) 774-7599

Website: www.cooplife.com/aboutcdi.htm

Description: CDI is a non-profit organization that offers fee-based services to assist in the development of cooperative businesses and organizations.

Type of Organization: Non-profit/Not for profit

Organization: Franklin County Chamber of Commerce (FCCC)

Address: P.O. Box 790, 395 Main St., Greenfield, MA 01302

Telephone: (413) 773-5463

Website: www.co.franklin.ma.us

Description: FCCC provides services to large and small businesses throughout Franklin County, including health insurance, networking opportunities, lobbying representation, and assistance with town events.

Type of Organization: Non-profit/Not for profit

Organization: Franklin County Community Development Corporation (FCCDC)

Address: The Venture Center, 324 Wells Street Greenfield, MA 01301

Telephone: (413) 774-7204

Website: www.fccdc.org

Description: The FCCDC offers business training, consulting, direct lending, community organizing, and real estate development services. The FCCDC also operates the Venture Center business incubator and the Western Mass. Food Processing Center.

Type of Organization: Non-profit/Not for profit

Organization: Franklin Regional Council of Governments (FRCOG)

Address: 425 Main Street, Room 20, Greenfield, MA 01301

Telephone: (413) 774-3167

Website: www.frcog.org

Description: The FRCOG provides services to the 26 towns of Franklin County including regional planning and community development, engineering, municipal and human services. Also, as a State Data Center affiliate free economic and demographic information is offered.

Type of Organization: Non-profit/Not for profit, Government

Organization: Franklin/Hampshire Career Center

Address: One Arch Place, Greenfield, MA 01301

Telephone: (413) 774-4361

Website: www.fhcc-onestop.com

Description: The Center's mission is to help job seekers secure employment and/or education to improve their economic situation as well as helping employers become more competitive and find workers with skills and abilities to be productive on the job.

Type of Organization: Government

Organization: Franklin/Hampshire Regional Employment Board (FHREB)

Address: One Arch Place, Greenfield, MA 01301

Telephone: (413) 774-1835

Website: www.fhcc-onestop.com/reb.html

Description: FHREB is the local administrator of public employment and training programs and services for area employers and residents overseen by the Mayor of Northampton, the Greenfield Selectmen, and the Private Industry Council.

Type of Organization: Government

Organization: Franklin-Hampshire Connect

Address: Franklin Regional Council of Governments, Courthouse- Room 20, 425 Main Street, Greenfield, MA 01301

Telephone: (413) 774-1194

Website: www.franklinconnect.org

Description: Connect is a membership based cooperative for the advancement of broadband services and deployment in Franklin and Hampshire County.

Type of Organization: Non-profit/Not for profit

Organization: Greenfield Community College - Office of Resource and Workforce Development

Address: 270 Main Street, Greenfield, MA 01301

Telephone: (413) 775-1607

Website:

www.gcc.mass.edu/foldergeninfo/wd/index.html

Description: GCC's Office of Resource and Workforce Development offers employers a resource for enhancing the skills of their employees through programs targeted to entry-level employee training, job enhancement workshops, and industry related workshops.

Type of Organization: Government

Organization: Mass Ventures

Address: 100 Venture Way, Hadley, MA 01060-9682

Telephone: (413) 587-2150

Website: www.massventures.com

Description: A regional venture development company focused on building high growth companies in Western Massachusetts. Consulting services offered include capital acquisition, venture development, strategic planning, market analysis, financial forecasting and more.

Type of Organization: Public/Private partnership

Organization: Massachusetts Chapter of the American Planning Association

Address: c/o Town of Barnstable, 200 Main St.

Hyannis, MA 02601

Telephone: (508) 862-4703

Website: www.massapa.org

Description: As part of the national American Planners Association, the MassAPA offers workshops, materials and other resources to assist planners.

Type of Organization: Non-profit/Not for profit

Organization: Massachusetts Department of Revenue - Business Information

Address: 436 Dwight Street, Springfield, MA 01103

Telephone: (413) 784-1000

Website: www.dor.state.ma.us/business.htm

Description: The DOR Business Information web page offers an explanation of tax obligations and electronic forms and filing for taxes and licensing and regulations.

Type of Organization: Non-profit/Not for profit

Organization: Massachusetts Development Finance Agency - Western Office

Address: 1441 Main Street, Springfield, MA 01103

Telephone: (413) 731-8848

Website: www.massdevelopment.com

Description: MassDevelopment programs include funding for pre-construction analyses, direct loans for

projects with clear community development or job creation/retention potential, and issuing tax-exempt and taxable bonds for applicable entities.

Type of Organization: Non-profit/Not for profit

Organization: Massachusetts Municipal Association (MMA)

Address: 60 Temple Place, Boston, MA 02111

Telephone: (800) 882-1498

Website: www.mma.org

Description: The MMA is a non-profit, statewide organization that brings municipal officials together to establish unified policies and to share information for the benefit of the community residents.

Type of Organization: Non-profit/Not for profit

Organization: Massachusetts Rural Development Council, Inc. (MRDC)

Address: 216 Draper Hall, UMASS, Amherst, MA 01003

Telephone: (413) 545-4404

Website: www.mrdc.org

Description: The MRDC is committed to securing the future of rural Massachusetts by building enduring public/private sector partnerships.

Type of Organization: Non-profit/Not for profit

Organization: Massachusetts Small Business Development Centers Network - Western Office

Address: Springfield Enterprise Center, 1 Federal St., Springfield, MA 01105-1160

Telephone: (413) 737-6712

Website: www.msbdc.som.umass.edu

Description: The Regional Office provides assistance to prospective and existing small businesses on topics such as business plan development, financing, personnel issues and marketing. MSBDC staff hold office hours at the Franklin County Chamber of Commerce.

Type of Organization: Government

Organization: Office of Industry Liaison and Economic Development - UMASS

Address: Goodell Building, UMASS, Amherst, MA 01003

Telephone: (413) 545-4516

Website: www.umass.edu/iled

Description: ILED works to connect the UMASS community with business and industry such as through the promotion of innovation and advancement of research.

Type of Organization: Government

Organization: Service Corps of Retired Executives (SCORE)

Address: c/o Franklin County Chamber of Commerce, P.O. Box 790, 395 Main St., Greenfield, MA 01301

Telephone: (413) 773-5463

Website: www.score.org

Description: The Franklin County Chamber of Commerce host SCORE services of technical assistance to area businesses at no charge through retired executives. The SCORE website also offers an extensive web-links page of online resources.

Type of Organization: Government

Organization: **Technology Enterprise Council (TEC)**

Address: 100 Venture Way, Suite 400, Hadley, MA 01035

Telephone: (413) 587-2195

Website: www.tecouncil.org

Description: TEC is a private, regional, industry-led organization created to advance the success of companies driven by information and communications technologies (affiliated with the Regional Technology Alliance).

Type of Organization: Public/Private partnership

Organization: **United States Rural Development Agency - Western Mass Office**

Address: 243 King Street, Room 24, Northampton, MA 01060

Telephone: (413) 585-1000

Website: www.rurdev.usda.gov/ma/index.html

Description: USDA Rural Development in the Southern New England Jurisdiction offers technical assistance and financial backing to rural businesses and cooperatives to create quality jobs in rural areas.

Type of Organization: Government

Organization: **United States Small Business Administration - Springfield Office (SBA)**

Address: Springfield, MA

Telephone: (413) 785-0484

Website: www.sba.gov/ma

Description: The SBA provides financial, technical and management assistance to help start, run, and grow businesses. SBA has a portfolio of business loans, loan guarantees and disaster loans, in addition to a venture capital portfolio.

Type of Organization: Government

Organization: **Western Massachusetts Enterprise Fund**

Address: PO Box 1077, 308 Main Street, Greenfield, MA 01302

Telephone: (413) 774-4033

Website: www.wmef.org

Description: The WMEF is a non-profit organization that provides financing and technical assistance to entrepreneurs and small businesses in the five counties of western Massachusetts. Loan programs with competitive interest rates range from \$1,000 to \$100,000.

Type of Organization: Non-profit/Not for profit

Organization: **Young Entrepreneurs Society, Inc. (YES)**

Address: PO Box 426, 1 South Main Street, Orange, MA 01364-0426

Telephone: (978) 544-1869

Website: www.geocities.com/yes_cafe

Description: YES offers training on business plan development and technical assistance to support youth entrepreneurship.

Type of Organization: Non-profit/Not for profit

APPENDIX C: Glossary

Broadband: The property of a circuit that has a bandwidth (the amount of data that can be passed along a communications channel in a given period of time) of greater than 4kHz (FCC Federal Standard 1037C and the American Heritage Dictionary). In general, the term broadband is often used to describe “always-on” Internet access that allows efficient download and upload of information, for example DSL or T1. The term broadband does not describe a specific form of transmission.

Class of worker: All people over the age of 15 who have been employed at any time are asked to designate the type of work normally done or the work performed most regularly. Occupations and types of work are then broken down into the following 5 classes (U.S. Census Bureau).

Private Wage and Salary Workers - Includes people who worked for wages, salary, commission, tips, pay-in-kind, or piece rates for a private-for-profit employer or a private-not-for-profit, tax-exempt, or charitable organization.

Government Workers - Includes people who are employees of any local, state, or federal governmental unit, regardless of the activity of the particular agency.

Self-Employed Workers - Includes people who worked for profit or fees in their own unincorporated business, profession, or trade, or who operated a farm.

Unpaid Family Workers - Includes people who worked 15 hours or more without pay in a business or on a farm operated by a relative.

Digital Subscriber Lines (DSL): Moderate speed broadband access (a rate sufficient to support Integrated Services Digital Network basic access) using existing copper lines. DSL service is limited by distance from the central office (FCC Federal Standard 1037C). In general, the term DSL describes a vehicle of transmission of moderate speed broadband Internet service.

Income: "Total income" is the sum of the amounts reported separately for wages, salary, commissions, bonuses, or tips; self-employment income from own non-farm or farm businesses, including proprietorships and partnerships; interest, dividends, net rental income, royalty income, or income from estates and trusts; Social Security or Railroad Retirement income; Supplemental Security Income; any public assistance or welfare payments from the state or local welfare office; retirement, survivor, or disability pensions; and any other sources of income received regularly such as Veterans' payments, unemployment compensation, child support, or alimony (U.S. Census Bureau).

Industrial Classification: The Census Bureau classifies establishments according to the new North American Industry Classification System (NAICS), which replaced the Standard Industrial Classification (SIC) codes used in previous censuses (U.S. Census Bureau).

Industry: Information on industry relates to the kind of business conducted by a person's employing organization. Some examples of industrial groups shown in products include agriculture, forestry, and fisheries; construction; manufacturing; wholesale or retail trade; transportation and communication; personal, professional and entertainment services; and public administration (U.S. Census Bureau).

Per capita income: Average obtained by dividing the aggregate income by total population of an area (U.S. Census Bureau).

Poverty: Following federal guidelines, the Census Bureau uses a set of income thresholds that vary by family size and composition to detect who is poor. If the total income for a family or unrelated individual falls below the relevant poverty threshold, then the family or unrelated individual is classified as being "below the poverty level" (U.S. Census Bureau).

T-1: A broadband digital transmission system operating at 1.544 Mbps (HEI Consulting). In general, the term T1 describes a vehicle of transmission that is a form of high speed, high capacity broadband service that allows

Internet access, data and/or telephone services. The vehicle of transmission can be a copper line, fiber or microwave.

APPENDIX D
HOUSING

Appendix

Housing Goals and Recommendations from the Regional Policy Plan

Housing Units in Shutesbury and Neighboring Towns, 1980-2000

Types of Housing Structures in Shutesbury, 1990 and 2000

Age of Housing in Shutesbury, 2000

Housing Occupancy and Vacancies in Shutesbury, 1980-2000

Monthly Homeowner Costs in Shutesbury, 2000

Monthly Renter Costs in Shutesbury, 2000

Housing Values for Owner-Occupied Homes in Shutesbury, 1990 and 2000

Percentage of Income Spent on Housing Costs for Homeowners, 2000

Percentage of Income Spent on Housing Costs for Renters, 2000

A Methodology for Identifying Potentially Suitable Land for Development in Shutesbury

Regional Policy Plan

(Franklin Regional Council of Governments, 1988)

Housing Goals and Recommendations

GOALS

- To promote the provision of fair, decent, safe, affordable housing for rental or purchase that meets the needs of Franklin County residents.
- To raise the affordable housing stock throughout the region to 10% of all housing units.
- To raise the affordable housing stock in all communities in the region.

RECOMMENDATIONS

- Prioritize local housing efforts to meet the region's need for affordable housing.
- Support the Franklin County Housing and Redevelopment Authority (HRA) in securing funds to complete a regional housing analysis to assess needs and the quality and quantity of existing affordable housing. This will allow agencies and municipalities to direct housing assistance and funds to the areas where they are needed most.
- Support the provision of affordable housing throughout the region, particularly in major employment centers served by public transit and village centers with public services.
- Assist agencies involved with planning and financing affordable housing, including alternative financing mechanisms such as land trusts, cooperative housing and limited equity cooperatives.
- Preserve existing affordable housing stock rather than converting it to other uses.
- Develop strategies that would guarantee long-term affordability. Prioritize projects, which offer long-term affordability (e.g., first priority is 99+ years, second priority is 40 - 98 years, third priority is 15 - 39 years, and last priority is less than 15 years).
- Support adaptive reuse of abandoned buildings for affordable housing stock.
- Initiate pro-active housing projects by towns to maintain control of development scale and style as befits town character.
- Pursue public grants and other sources of funding to enhance the financial feasibility of affordable housing development.
- Support HRA and local housing authority efforts to increase awareness of need for affordable housing and resources available.

- Encourage housing that minimizes long term costs through high quality design, efficient construction and energy efficiency.
- Towns should consider provisions in local regulations for multi-family and clustered housing in village centers served by public water and sewer and preferably, public transit.
- Towns should consider contributing resources toward the development of long term (preferably 99 years) affordable elderly housing, such as tax title foreclosures of buildings or land for housing sites.
- Towns should consider implementing community home improvement programs and property tax deferrals which help low income households to make home improvements and remain in their homes.
- Support HRA and local housing authority efforts to encourage major employers to implement programs which contribute towards meeting their employees' affordable housing needs, such as mortgage assistance plans, mortgage guarantee programs and assistance with down payments and closing costs.
- Support HRA and local housing authority efforts that encourage lending institutions to make special provisions, which are supportive of low income households.
- Town residents should take advantage of HRA's low and moderate income housing programs such as the Self-Help building funds, septic upgrades and home improvement financing.
- Support legislation offering funding mechanisms to remove lead-based paint in rental units.
- Support additional public funding for effective code enforcement for affordable housing.
- Support requirements and efforts to fund ongoing maintenance and management of rental housing complexes.

Table 3-22: Housing Units in Shutesbury and Neighboring Towns, 1980-2000

Area	Number of Housing Units			Percentage Change		
	1980	1990	2000	1980-1990	1990-2000	1980-2000
Shutesbury	536	716	807	33.6%	12.7%	+50.6%
Leverett	564	699	648	23.9%	-7.3%	14.9%
New Salem	279	328	379	17.6%	15.5%	35.8%
Wendell	305	400	439	31.1%	9.8%	43.9%
Amherst	7,699	8,816	9,426	14.5%	6.9%	22.4%
Pelham	401	502	556	25.2%	10.8%	38.7%
Franklin	26,832	30,394	31,939	+13.3%	+5.1%	+19.0%
Massachusetts	2,208,146	2,472,711	2,621,989	+12.0%	+6.0%	+18.7%

Sources: U.S. Census Bureau, Census of Population & Housing, 1980, 1990, and 2000.

Table 3-23: Types of Housing Structures in Shutesbury, 1990 and 2000

Structure Type	1990		2000		1990-2000
	Number of Units	Percent of Total	Number of Units	Percent of Total	Change in Units
Single Unit, detached	643	90.0%	731	90.6%	+88
Single Unit, attached	10	1.3%	20	2.5%	+10
Single Unit, total	653	91.2%	751	93.1%	+98
Two Unit Building	36	5.0%	34	4.2%	-2
3-4 Unit Building	12	1.7%	18	2.2%	+6
5 or more Unit	0	0.0%	0	0.0%	0
Mobile Home	6	0.8%	4	0.5%	-2
Other	9	1.3%	0	0.0%	-9
Total Units	716	100.0	807	100.0	+91

Source: U.S. Census Bureau, Census of Population and Housing, 1990 and 2000.

Table 3-24: Age of Housing in Shutesbury, 2000

Year Built*	Number of Units	Percent of all Units
1999 to March 2000	8	1.0%
1995 to 1998	32	4.0%
1990 to 1994	82	10.2%
1980 to 1989	153	19.0%
1970 to 1979	193	23.9%
1960 to 1969	107	13.3%
1940 to 1959	115	14.3%
1939 or earlier	117	14.5%
Total	807	100.0%

*Original year of construction. Does not include housing renovations or rehabilitation.

Source: U.S. Census Bureau, Census of Population and Housing, 2000.

Table 3-25: Housing Occupancy and Vacancies in Shutesbury, 1980-2000

	1980		1990		2000	
	Number of Units	Percent of Total	Number of Units	Percent of Total	Number of Units	Percent of Total
Total Units	536		716		807	
Occupied Year-Round	376	70.1%	575	80.3%	662	82.0%
Vacant Year-Round Units	11	2.1%	16	2.2%	12	1.5%
Total Year-Round Units	387	72.2%	591	82.5%	674	83.5%
Total Vacant Units that aren't Year-Round	149	27.8%	125	17.5%	133	16.5%
Units with Seasonal/Occasional Use*	n/a	n/a	119	16.7%	131	16.2%
Other Vacant Units (without Seasonal/Occasional Use)	n/a	n/a	6	0.8%	2	0.2%

*The Census Bureau counts units with seasonal or occasional use as vacant, even though they have part-time residents. Source: U.S. Census Bureau, Census of Population & Housing, 1980, 1990, and 2000.

Table 3-26: Monthly Homeowner Costs in Shutesbury, 2000

Monthly Costs (2000)	Homes with Mortgages		Homes without Mortgages	
	Number of Homes	Percentage of Homes with Mortgages*	Number of Homes	Percentage of Homes without Mortgages*
\$200 to \$299	0	0.0%	10	14.1%
\$300 to \$399	2	0.5%	24	33.8%
\$400 to \$499	2	0.5%	15	21.1%
\$500 to \$599	2	0.5%	8	11.3%
\$600 to \$699	18	4.9%	4	5.6%
\$700 to \$799	14	3.8%	4	5.6%
\$800 to \$899	34	9.3%	4	5.6%
\$900 to \$999	38	10.4%	0	0.0%
\$1,000 to \$1,249	105	28.6%	2	2.8%
\$1,250 to \$1,499	78	21.3%	0	0.0%
\$1,500 to \$1,999	44	12.0%	0	0.0%
\$2,000 to \$2,499	24	6.5%	0	0.0%
\$2,500 or more	6	1.6%	0	0.0%
Total with Estimated Costs	367	100.0%	71	100.0%
Median Costs	\$1,175		\$410	

*Percentages are based on the number of owner-occupied housing with estimated housing costs. The Census Bureau calculated these costs for 80% of Shutesbury's owner-occupied homes. Source: U.S. Census Bureau, Census of Population & Housing, 2000.

Table 3-27: Monthly Renter Costs in Shutesbury, 2000

Monthly Costs (2000)	Number of Rental Units	Percentage of Rental Units with Estimated Costs*
\$150 to \$199	5	5.3%
\$200 to \$299	3	3.2%
\$300 to \$399	4	4.2%
\$400 to \$499	2	2.1%
\$500 to \$599	13	13.7%
\$600 to \$699	10	10.5%
\$700 to \$799	9	9.5%
\$800 to \$899	11	11.6%
\$900 to \$999	13	13.7%
\$1,000 to \$1,249	20	21.1%
\$1,250 to \$1,999	5	5.3%
Total with Estimated Costs	95	100.0%
Median Costs	\$814	

*Percentages are based on the number of rental-occupied housing with estimated housing costs. The Census Bureau estimated rental housing costs for 81% of Shutesbury's occupied rental units.

Source: U.S. Census Bureau, Census of Population & Housing, 2000.

Table 3-28: Housing Values for Owner-Occupied Homes in Shutesbury, 2000

Housing Value	1990		2000	
	Number of Homes	Percent of Homes with Housing Values*	Number of Homes	Percent of Homes with Housing Values*
Under \$50,000	8	2.2%	2	0.4%
\$50,000 to \$99,999	50	14.6%	48	8.8%
\$100,000 to \$149,999	143	41.1%	176	32.2%
\$150,000 to \$199,999	73	21.0%	164	30.0%
\$200,000 to \$249,999	56	16.1%	79	14.4%
\$250,000 to \$299,999	8	2.2%	40	7.3%
\$300,000 to \$399,999	8	2.2%	28	5.1%
\$400,000 to \$499,999	2	0.6%	6	1.1%
\$500,000 or More	0	0.0%	4	0.7%
Total with Estimated Housing Values	348	100.0%	547	100.0%
Median Housing Value	\$142,300		\$162,100	

*Housing values in Shutesbury were estimated for 76% of owner-occupied homes in 1990 and 100% of owner-occupied homes in 2000.

Source: U.S. Census Bureau, Census of Population and Housing, 1990 and 2000.

Table 3-29: Incomes in Shutesbury and Affordable Housing Costs, 1999

	Median Household Income	Monthly Affordable Housing Cost (30% of income)
Median Household Income Overall	\$60,437	\$1,638
Median Household Income by Age Group		
- Head of household under 25 years old	\$33,125	\$828
- Head of household 25-34 years old	\$44,286	\$1,107
- Head of household 35-44 years old	\$58,333	\$1,458
- Head of household 45-54 years old	\$66,364	\$1,659
- Head of household 55-64 years old	\$71,250	\$1,781
- Head of household 65-74 years old	\$61,667	\$1,542
- Head of household 75 years old and over	\$21,250	\$531

Source: U.S. Census Bureau, Census of Population and Housing, 2000.

Table 3-30: Percentage of Income Spent on Housing Costs for Homeowners, 2000

Household Income (1999)	Number of Households with this Data**	Number (& Percentage)* of Households in each Category				
		Spend Under 20% of Income on Housing Costs	Spend 20-24% of Income on Housing Costs	Spend 25-29% of Income on Housing Costs	Spend 30-34% of Income on Housing Costs	Spend at Least 35% of Income on Housing Costs
Under \$10,000	6	0	0	0	0	6 (100%)
\$10,000 to \$20,000	16	0	0	0	0	16
\$20,000 to \$35,000	41	4 (10%)	5 (12%)	6 (15%)	2 (5%)	24 (59%)
\$35,000 to \$50,000	71	13 (18%)	18 (25%)	8 (11%)	10 (14%)	22 (31%)
\$50,000 to \$74,999	132	46 (35%)	39 (30%)	28 (21%)	11 (8%)	8 (6%)
\$75,000 to \$99,999	90	62 (69%)	20 (22%)	6 (7%)	0	2 (2%)
\$100,000 or over	80	70 (88%)	8 (10%)	2 (3%)	0	0
Total for Owners	436	195 (45%)	90 (21%)	50 (11%)	23 (5%)	78 (18%)

*Percentages in each row total to 100%, except for possible rounding. Percentages are calculated based on total number of renters in each income category with cost percentage data.

**Housing costs relative to income were estimated for 80 percent of owner-occupied units.

Source: U.S. Census Bureau, Census of Population and Housing, 2000.

Table 3-31: Percentage of Income Spent on Housing Costs for Renters, 2000

Household Income (1999)	Number of Households with this Data**	Number (& Percentage)* of Households in each Category				
		Spend Under 20% of Income on Housing Costs	Spend 20-24% of Income on Housing Costs	Spend 25-29% of Income on Housing Costs	Spend 30-34% of Income on Housing Costs	Spend at Least 35% of Income on Housing Costs
Under \$10,000	6	0	0	0	0	6 (100%)
\$10,000 to \$20,000	14	0	0	0	0	14
\$20,000 to \$35,000	26	5 (19%)	4 (15%)	2 (8%)	4 (15%)	11 (42%)
\$35,000 to \$50,000	18	0 (0%)	3 (17%)	9 (50%)	4 (22%)	2 (11%)
\$50,000 to \$74,999	14	11 (79%)	3 (21%)	0	0	0
\$75,000 to \$99,999	8	7 (88%)	1 (13%)	0	0	0
\$100,000 or over	7	7 (100%)	0	0	0	0
Total for Renters	93	30 (32%)	11 (12%)	11 (12%)	8 (9%)	33 (35%)

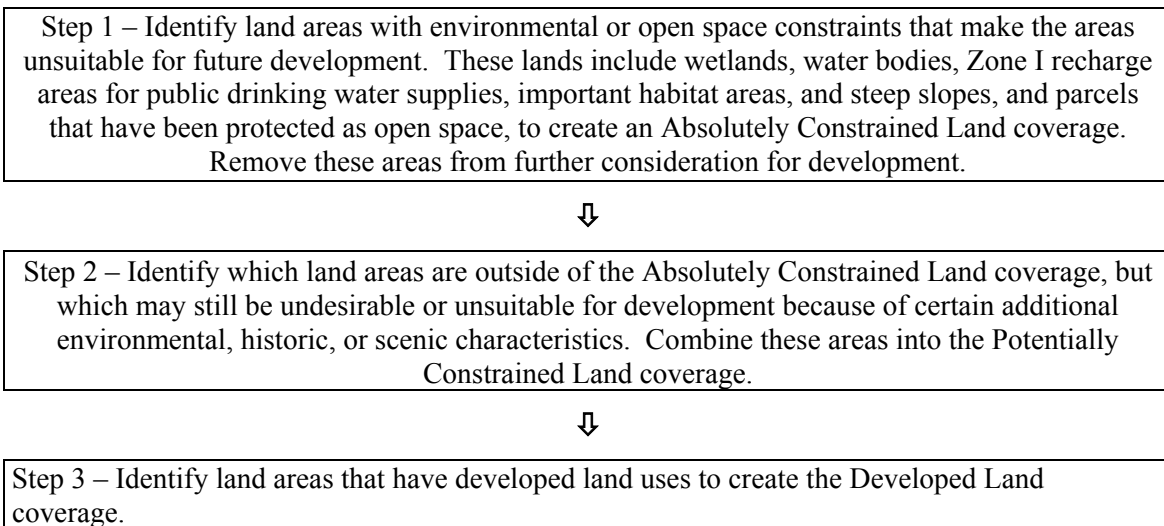
*Percentages in each row total to 100%, except for possible rounding. Percentages are calculated based on total number of renters in each income category with cost percentage data.

**Housing costs relative to income were estimated for 81 percent of renter-occupied units.

Source: U.S. Census Bureau, Census of Population and Housing, 2000.

A Methodology for Identifying Potentially Suitable Land for Development in Shutesbury

Figure 1-1: Methodology for Identifying Potentially Suitable Land for Development





Step 4 – Identify which land areas are in neither the Developed Land coverage nor the Absolutely Constrained Land coverage. Combine these areas into the Potentially Developable Land coverage.



Step 5 – From the Potentially Developable Land coverage, evaluate which land may potentially be the most suitable for new residential development. Review the federal floodplain maps for the identified potential development sites, and gather other relevant information. Adjust and refine the potentially suitable development areas, as project budget allows.

Step 1: Identify Areas with Absolute Environmental or Open Space Constraints

This step identifies land with environmental or open space constraints that make it unsuitable for new development. The areas with these constraints are shown on the natural resource maps discussed earlier and on the Developed Land Uses and Absolute Constraints Map.

The following areas should be included in the Absolutely Constrained Land coverage:

- National Wetlands Inventory wetlands. The location of these wetlands has been documented by the U.S. Fish and Wildlife Service's National Wetlands Inventory project. Wetlands in Massachusetts are protected from development under the Massachusetts Wetlands Protection Act (Massachusetts General Laws, Chapter 131, Section 40).
- 100-foot buffer area of wetlands. The State Wetlands Protection Act regulates and restricts development within 100 feet of wetlands.
- Rivers, ponds, and other water bodies. The locations of these water resources have been identified by MassGIS, using National Wetland Inventory data on pond and lake locations and MacConnell land use data on other water bodies (land use code = 20 (Water)).
- 200-foot buffer areas of rivers. The Massachusetts Wetlands Protection Act regulates and restricts development within 200 feet of riverbanks. Riverfront areas were added to the Wetlands Protection Act after the passage of the Rivers Protection Act in 1996.
- Public water supplies and Zone I recharge areas. The locations of these resources have been documented by the Massachusetts Department of Environmental Protection (DEP). The land uses in Zone I areas (the 400 foot radius area around public water supplies) can have an immediate effect on well water quality.
- Estimated Habitats of Rare Wildlife in wetland resource areas, Priority Habitats of Rare Species, and Core Habitats for Rare Species and Natural Communities. The locations of these resources have been identified by the Massachusetts Natural Heritage and Endangered Species Program (NHESP), as the primary and most-important habitat areas for the State's rare species. Development in the Estimated Habitats of Rare Wetlands Wildlife is regulated under the State Wetland Protection Act. Other rare species documented by the NHESP are protected under the Massachusetts Endangered Species Act.
- Areas with a slope of over 25 percent. The information on slopes has been derived from contour line data produced by the U.S. Geological Survey (USGS). It is generally considered unfeasible to build on slopes of 25 percent or greater, due to the high costs of construction, the likelihood of erosion, and the difficulty of traversing such steep terrain, particularly during the winter.

- Protected open space areas. These areas have been located using parcel maps and information from the Town of Shutesbury Assessors, and the open space data layer as produced by town volunteer, J. Stone, in collaboration with FRCOG GIS staff. The protected open space areas include both publicly and privately owned properties. Privately owned properties that are protected as open space have deed restrictions that prevent future development. A list of all the parcels in Shutesbury that are protected from development appears in Chapter 1-Natural Resources and Open Space.

Step 2: Identify Areas with Potential Environmental Constraints

This step identifies land that is not absolutely constrained from development, but which may still be undesirable or unsuitable for new development, because of other potential environmental constraints.

The areas that are potentially constrained from development include:

- Areas with a slope of 15 to 25 percent. The information on slopes has been derived from contour line data produced by the U.S. Geological Survey (USGS). Building on slopes of 15 to 25 percent can result in adverse environmental impacts, including erosion. In addition, slopes of 15 to 25 percent can pose limits on industrial and commercial development. Large industrial and commercial facilities typically require relatively flat slopes, and it can be prohibitively expensive to re-grade a site to that extent.
- Aquifers. The locations of these underground resources have been identified by MassGIS and the Massachusetts Department of Environmental Protection (DEP). The potential yield of the aquifers was determined using surficial geological data provided by MassGIS and maps produced by the USGS. Aquifers provide the source for drinking water supplies such as community wells. Underground aquifer levels are maintained by groundwater flow from aquifer recharge areas. Protecting groundwater and aquifer recharge areas from degradation is important to maintaining the quality of drinking water supplies.
- Interim Wellhead Protection Areas and Zone II Areas. Data on the Interim Wellhead Protection Areas and Zone II Areas come from the DEP. These areas surround Shutesbury's public water supplies. A delineated Zone II wellhead protection area includes the sections of an aquifer from which a well would be expected to draw during an extended dry period (up to 6 months) without precipitation. As a result, land uses within wellhead protection areas can have an impact on drinking water quality. The location and extent of Zone II Wellhead Protection Areas have been verified through DEP hydro-geologic modeling and officially approved. In the absence of hydro-geologic modeling studies, an Interim Wellhead Protection Area may be established by the DEP. The radius of an Interim Wellhead Protection Area will vary from 400 feet to half a mile, depending on a well's known pumping rate or DEP default values if the pumping rate is unknown.

- Areas with Prime Farmland Soils. The areas with prime farmland soils have been identified using the 1979 U.S. Department of Agriculture, Soil Conservation Service map, “Important Farmlands in Franklin County.” Prime farmland soils have the best combination of physical and chemical characteristics for crop production, and protecting areas with prime farmland soils for agricultural purposes can help farming activities remain viable within the community.

Step 3: Identify Areas that Contain Developed Land Uses

This step identifies land that is currently developed. This identification relies on the 1999 MacConnell land use data provided by MassGIS. The MassGIS land use data layer has twenty-one land use classifications interpreted from 1:25,000 scale aerial photography. Table 1 lists the land uses, which are in the Developed Land coverage. The areas with developed land uses are shown on the Land Use Suitability Map.

Table 1: Land Uses which are Included in the Developed Land coverage

Land Use Code	Land Use	Land Use Description
8	Spectator Recreation	Stadiums, racetracks, fairgrounds, drive-in theatres
9	Water-Based Recreation	Beaches, marinas, swimming pools
10	Residential	Multi-family
11	Residential	Homes on lots less than a quarter-acre
12	Residential	Homes on lots a quarter-acre to a half-acre
13	Residential	Homes on lots larger than a half-acre
15	Commercial	General urban; shopping centers
16	Industrial	Light and heavy industry
17	Urban Open	Parks, cemeteries, public and institutional buildings and green spaces
18	Transportation	Airports, docks, divided highway, freight storage, railroads
19	Waste Disposal	Landfills, sewage lagoons

Step 4: Identify Areas that are Potentially Developable

This step identifies land that is potentially developable. In Step 4, the Potentially Developable Land Coverage is created from any areas that are not constrained by the environmental and open space characteristics listed in Step 1, and that are also currently undeveloped. Developed land areas were identified in Step 3 and combined into the Developed Land coverage.

Step 5: Identify the Potentially Most Suitable Areas for Residential, Commercial, or Light Industrial Development

This step develops specific criteria for identifying the potentially most suitable locations for residential development, from the Potentially Development Land coverage.

APPENDIX E
COMMUNITY FACILITIES AND
SERVICES

APPENDIX F
TRANSPORTATION

TOWN OF SHUTESBURY

PAVEMENT MANAGEMENT STUDY

SCENARIO 1



**FRANKLIN REGIONAL
COUNCIL OF GOVERNMENTS**

425 Main Street, Greenfield, MA 01301
413-774-3167



June 2004

TOWN OF SHUTESBURY

PAVEMENT MANAGEMENT STUDY

SCENARIO 1

Franklin Regional Council of Governments

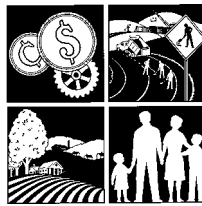
Patricia Allen, Chair

Franklin Regional Council of Governments Executive Committee

Bill Perlman, Chair

Franklin Regional Planning Board

Thomas W. Hutcheson, Chair



June 2004

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Executive Summary

The Franklin Regional Council of Governments (FRCOG) has been involved in pavement management since the early 1990s. In 1997 the FRCOG concluded a three year contract with the Massachusetts Highway Department (MassHighway) that completed the survey and analysis of nearly 500 miles of Federal-Aid and State Transportation Program (STP) funded roads in the 26 Franklin County communities. Since the completion of that contract, the FRCOG has continued its commitment to assist Franklin County communities who are interested in establishing a Pavement Management System for their community. The Town of Shutesbury requested that a portion of their Executive Order 418 funding be utilized to produce a pavement management analysis of the town maintained paved road network. The results of the analysis are contained within this report.

The Town of Shutesbury maintains 31.15 miles of roadway, of which 15.45 miles are paved. The FRCOG conducted a pavement surface survey during the fall of 2002 and analyzed the data. The survey indicates that the Town is implementing sound pavement management practices with the limited funds that are available, with the paved road network currently in a Good overall condition.

An analysis of future conditions indicates that existing levels of Chapter 90 funding are not sufficient to allow the Town to improve or even maintain the existing level of pavement conditions through 2012. An additional analysis looked at the effect on the paved road network conditions if Chapter 90 funds were restored to an annual \$150 million statewide program. This analysis involved adding an additional \$35,500 per year of funding, and indicated that with restored Chapter 90 funding levels existing pavement conditions could be maintained in a perpetual Good condition. The analysis indicated that with the additional \$240,000 of funds (the total amount of additional Chapter 90 funds that would be made available to the Town of Shutesbury if the program was restored to \$150 million per year) over ten years to 2012, could result in a savings of \$190,000 in repair costs compared to existing funding levels and protect past investments in the paved road network.

The Town already does an excellent job of utilizing available funding sources, but for it to protect the investment it has already made, additional maintenance funds must be found. In these tough economic times it is difficult to leverage additional funds, but with Governor Romney's new Road and Bridge Policy of "Fix It First", this report could be used as justification when lobbying for additional funding now or in the future.

The Town now has the base data that will allow it to monitor its progress with maintaining the road network through the regular survey of its paved road network and the FRCOG will continue to provide support to the extent possible.

Introduction

The Franklin Regional Council of Governments (FRCOG) has been involved in pavement management since the early 1990s. In 1997 the FRCOG concluded a three-year contract with the Massachusetts Highway Department (MassHighway) that completed the survey and analysis of nearly 500 miles of Federal-Aid and State Transportation Program (STP) funded roads in the 26 Franklin County communities. Since the completion of that contract, the FRCOG has continued its commitment to assist Franklin County communities who are interested in establishing a Pavement Management System for their community. Since 1997 the FRCOG has completed pavement management studies for the towns of Buckland, Heath, Orange and Shelburne. The Town of Shutesbury requested that a portion of their Executive Order 418 funding be utilized to produce a pavement management analysis of the town maintained paved road network. The FRCOG was contracted to complete the study and the results of the analysis are contained within this report.

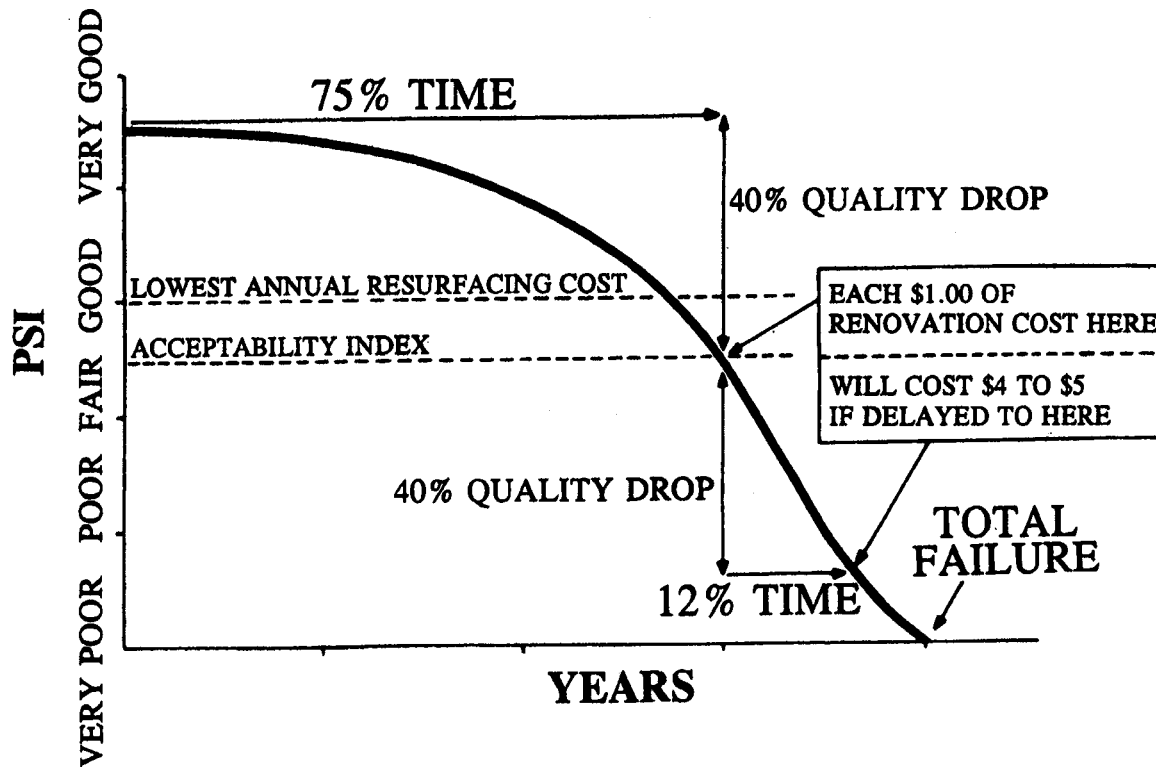
A Pavement Management System (PMS), as defined by the American Public Works Association (APWA), is “a systematic method for routinely collecting, storing, and retrieving the kind of decision-making information needed (about pavement) to make maximum use of limited maintenance and construction dollars.” Historically, road maintenance funds were channeled to those roads that were perceived by local highway superintendents to be in the worst condition, or where political influence dictated. Various studies have indicated that a pavement maintained in a perpetual “Good” to “Excellent” condition, requires one-fourth to one-fifth the investment of a pavement that is un-maintained and rehabilitated once it reaches a “Poor” or “failed” condition. A PMS is designed to provide quantitative information to support repair and budget decisions which reflect this thinking.

Figure 1 gives a graphical depiction of the general life cycle of an asphalt pavement. Under normal conditions of consistent weather and traffic patterns, a pavement will deteriorate by 40 percent in the first 75 percent of its life. During the next 12 percent of its life, the pavement will deteriorate by a further 40 percent. With proper timing of preventative maintenance measures during the first 75 percent of a pavement’s life, many years can be added to the functionality of the road at a lower overall cost.

With limited availability of transportation funding, it is more important than ever to make cost-effective decisions. A formalized PMS improves on the existing practices that most highway departments already employ by enhancing professional judgment through guidelines and a standardized approach. It also provides highway departments and Town officials with information that can be used to levy additional funding either from Town Meeting or State and Federal sources. A PMS is generally based on a computer software database that has been developed from years of research into the function and longevity of pavement materials and the effects of timed repair strategies. A PMS can help in determining the most appropriate time for repair action, the most cost-effective methods, and the cost of maintaining the roadway at the desirable condition level.

This pavement management study provides the core information and a starting point for the formalizing of a pavement management system for the Town.

Figure 1: Life Cycle of Asphalt Pavement



ROADWAY DETERIORATION vs TIME

Source: 1996 Pavement Management Program Technical Report, MassHighway

Background

The FRCOG utilizes the RoadManager (RM) pavement management software for its pavement management studies and extracts basic geometric and administrative information about roads from the MassHighway maintained Road Inventory File (RIF). The RIF is a computerized database containing information on all public roads and highways within the Commonwealth of Massachusetts. It was originally compiled from field data collected between 1969 and 1974 and has become an important reference source for transportation planning and administration at the Federal, State and local levels. In conjunction with this study, the FRCOG has worked with the Highway Superintendent, to update the information contained in the latest version of the RIF. A number of new roadways have been constructed, as well as street names changed, and these have been incorporated into the data used in this study. The FRCOG will be working with the Town and MassHighway to ensure that all updates identified will be reflected in future versions of the RIF.

The road network in the Town of Shutesbury is comprised of both paved and gravel surfaces. According to the 2001 year end release of the RIF with the subsequent updates, the Town is

responsible for the maintenance of 31.15 miles of roadway and MassHighway is responsible for the maintenance of 3.16 miles of roadway. Unaccepted (abandoned or privately maintained) roadways account for an additional 6.24 miles, and the Metropolitan District Commission (MDC) is responsible for the maintenance of another 4.87 miles of roads within the town. This produces a total of 45.42 miles of both paved and gravel roadways in the Town of Shutesbury. It should be noted that these mileages are provisional until MassHighway has accepted the submitted updates. Map 1 shows the Shutesbury road network by Maintenance Authority (i.e. Town, MassHighway, etc.)

Functional Classification of roadways was mandated under the Federal Intermodal Surface Transportation Efficiency Act (ISTEA) legislation passed in 1991, and was completed in 1993 by MassHighway in cooperation with the 13 Regional Planning Agencies. The Federal Highway Administration states that, “Functional classification is the process by which streets and highways are grouped into classes, or systems, according to the character of service they are intended to provide. Functional classification defines the nature of this channelization process by defining the part that any particular road or street should play in serving the flow of trips through a highway network.”¹ The classification ranks roads according to a hierarchy and determines which roads are eligible for Federal Aid and State Transportation Program (STP) funds for improvements through the Transportation Improvement Program (TIP) coordinated by the Franklin Regional Council of Governments.

There are four basic categories of functional classification based on the hierarchical system. They are:

- Interstates - Highways that serve interstate travel;
- Arterials - Roads that link cities to towns or provide interstate/intercounty service;
- Collectors - Roads that serve towns outside of the arterial system, lead to the arterial system, or link towns; and
- Local - Roads that primarily serve residential areas or adjacent land uses.

Arterials and Collectors have further sub-classifications of “Urban” or “Rural”, and “Major” or “Minor” based on population density characteristics. All roadways in Shutesbury are termed “Rural”.

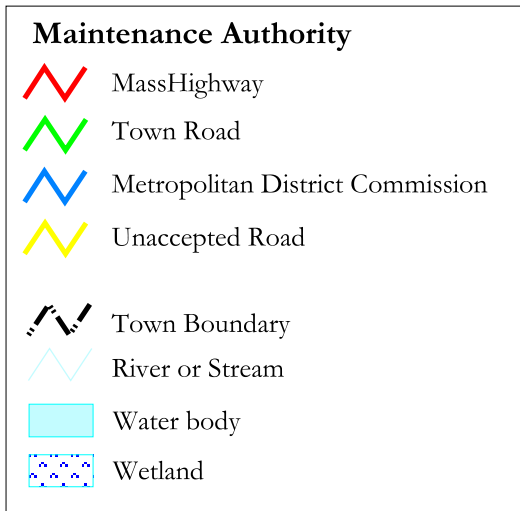
Shutesbury’s road network is made up of Arterial, Collector and Local classified roadways. Map 2 shows the road network and the assigned functional classifications. The 3.16 miles of Route 202 maintained by MassHighway is functionally classified as Rural Minor Arterial. Of the 31.15 miles of roadway maintained by the Town, 8.50 miles are classified as Rural Major Collector, 2.79 miles as Rural Minor Collector and the remaining 19.86 miles as Rural Local. Town maintained roadways classified as Rural Major Collector are eligible for Federal Aid and STP funds for reconstruction through the TIP Process. The procedures for applying for this source of funding are discussed later in this report.

¹ Highway Functional Classification: Concepts, Criteria and Procedures. U.S. Department of Transportation, Federal Highway Administration. March 1989. Publication number FHWA-ED-90-006

TOWN OF SHUTESBURY PAVEMENT MANAGEMENT STUDY

SCENARIO 1

Map 1 - Maintenance Authority

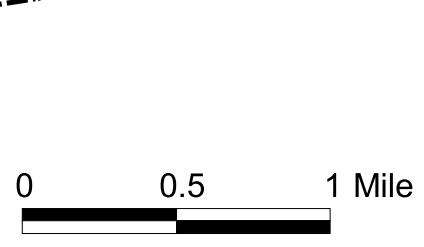
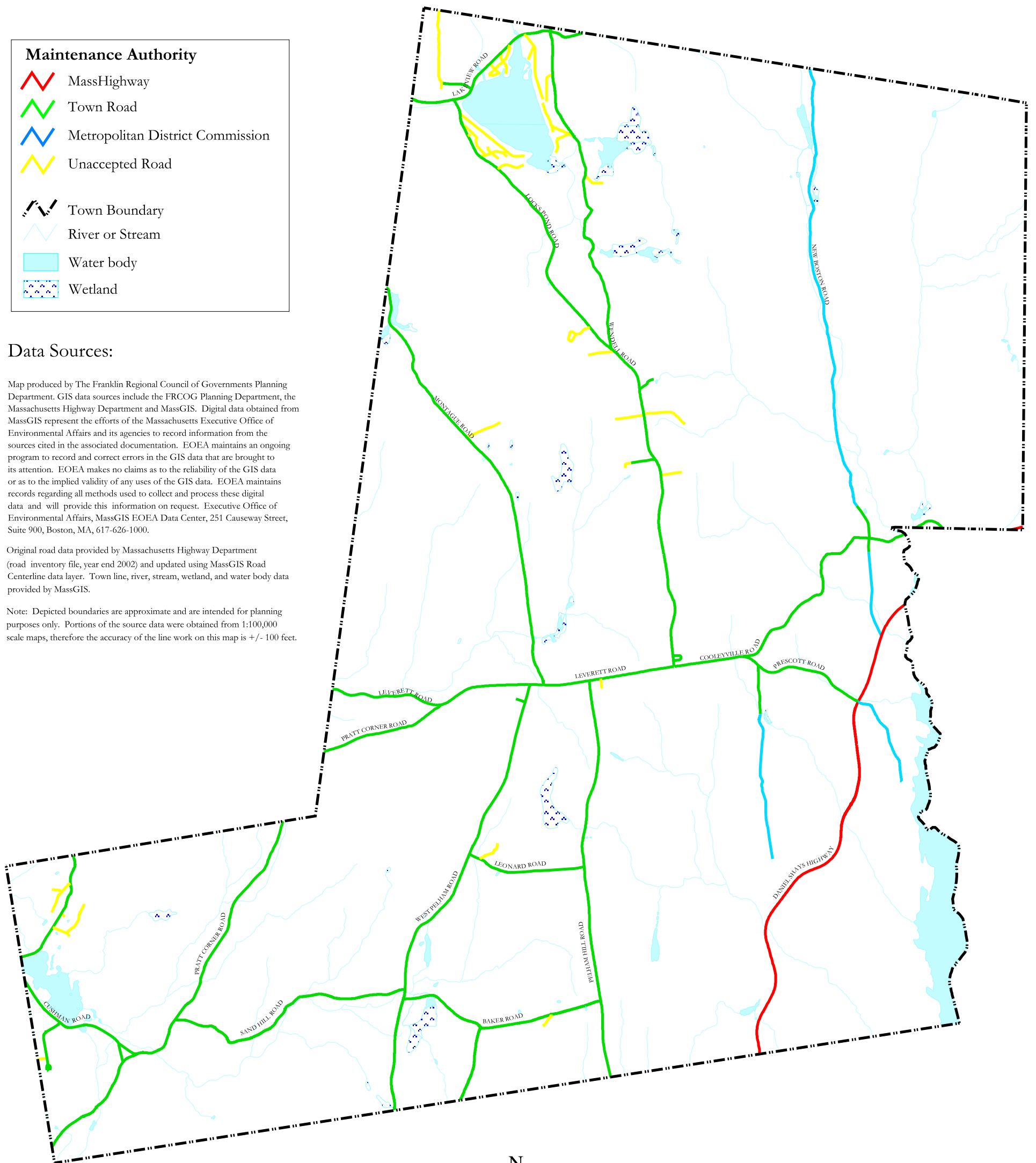


Data Sources:

Map produced by The Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, the Massachusetts Highway Department and MassGIS. Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. EOEa maintains an ongoing program to record and correct errors in the GIS data that are brought to its attention. EOEa makes no claims as to the reliability of the GIS data or as to the implied validity of any uses of the GIS data. EOEa maintains records regarding all methods used to collect and process these digital data and will provide this information on request. Executive Office of Environmental Affairs, MassGIS EOEa Data Center, 251 Causeway Street, Suite 900, Boston, MA, 617-626-1000.

Original road data provided by Massachusetts Highway Department (road inventory file, year end 2002) and updated using MassGIS Road Centerline data layer. Town line, river, stream, wetland, and water body data provided by MassGIS.

Note: Depicted boundaries are approximate and are intended for planning purposes only. Portions of the source data were obtained from 1:100,000 scale maps, therefore the accuracy of the line work on this map is +/- 100 feet.

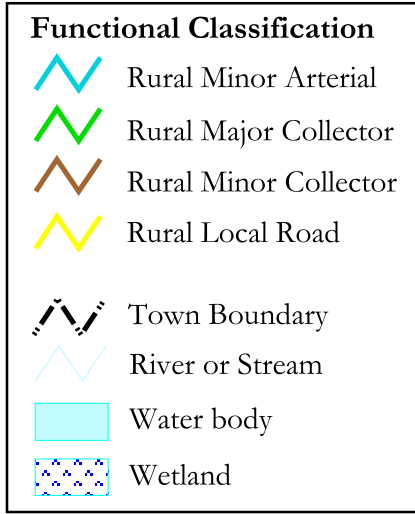


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TOWN OF SHUTESBURY PAVEMENT MANAGEMENT STUDY

SCENARIO 1

Map 2 - Functional Classification

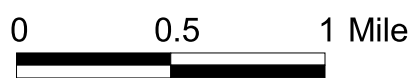
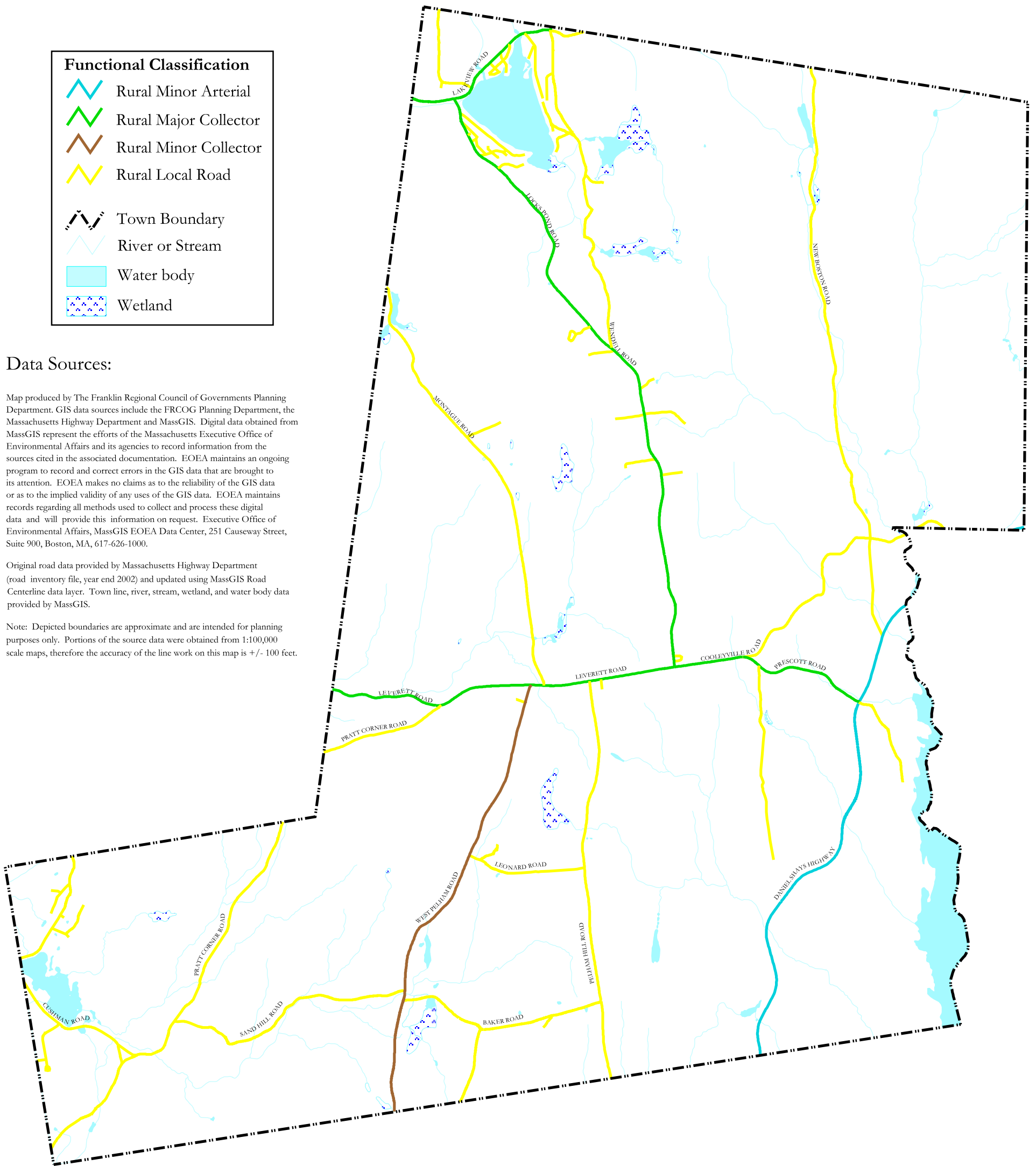


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Map 3 - Surface Type

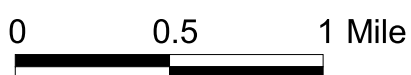
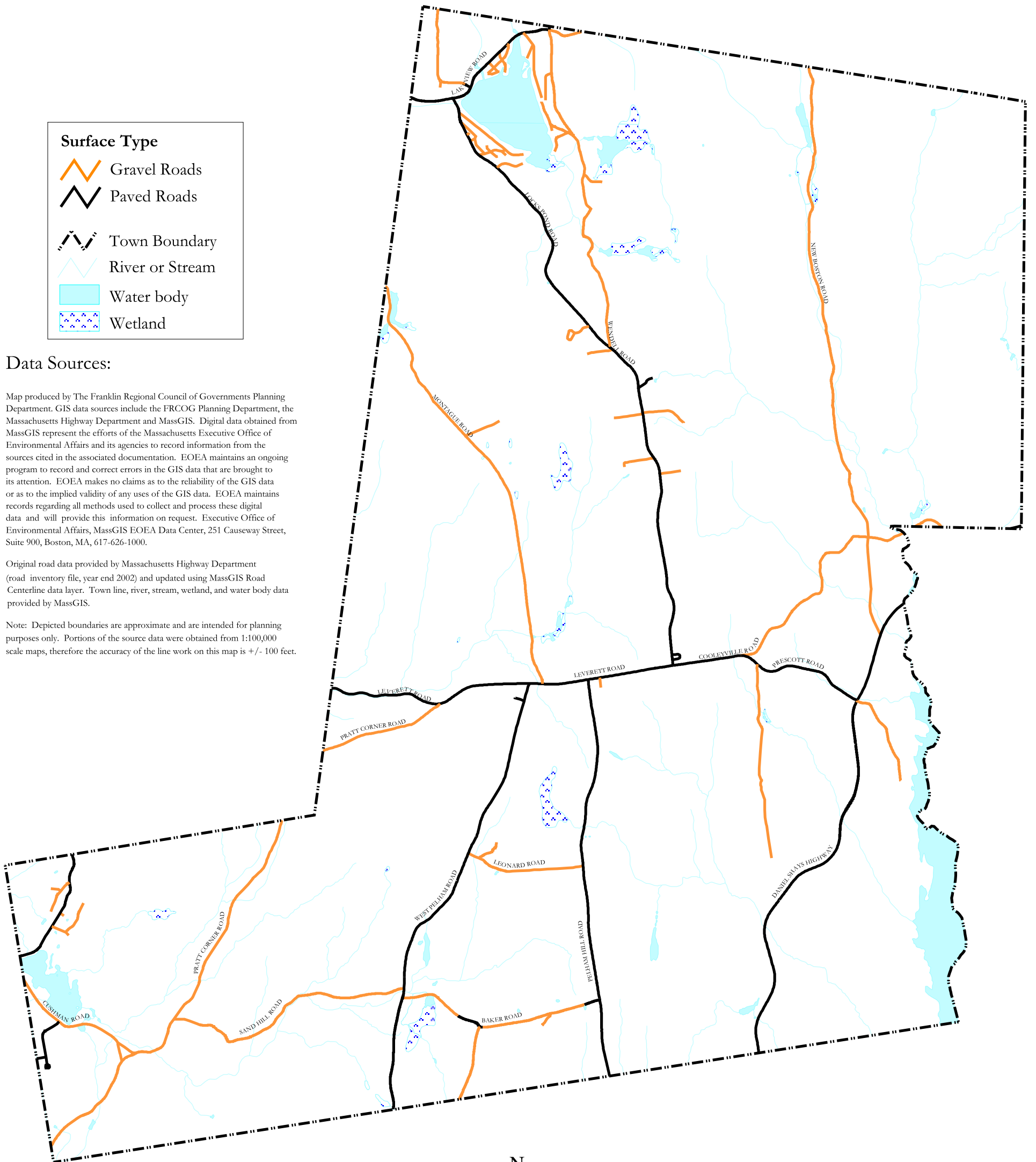


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As mentioned previously, there are 31.15 miles of Town maintained paved and gravel roads within the Town of Shutesbury. Because gravel roads generally receive regular maintenance this report deals only with the paved road network. The pavement survey identified 14.98 miles of town maintained paved roadway and 16.17 miles of town maintained gravel roads. The Highway Superintendent (Tim Hunting) identified 0.47 miles of Pelham Hill Road from Baker Road to the Pelham town line that is currently gravel and may be paved in the future. Therefore, for the purposes of this study this section of roadway has been treated as being paved bringing the paved road mileage to 15.45 miles and reducing the gravel mileage to 15.70 miles. Map 3 distinguishes the paved road network from the gravel surfaced roadways. The 3.16 miles of MassHighway maintained roadways are all paved and were surveyed as part of this study.

Methodology

The methodology used for data collection and analysis was designed to maximize the effectiveness of the RM software. For each paved road, section breaks were defined based on the following criteria: at a change in pavement surface type; at a pavement width change of more than five feet; or if the pavement conditions changed dramatically. All data collection was conducted by a field survey. This involved driving each road twice. The first pass identified the start and end points of each section, additionally the section length and width were recorded along with the pavement type. The second pass was made at low speed (5 mph) during which the average pavement distresses were noted.

The RM software requires the identification of nine categories of distresses, which are:

1. Potholes and Non-Utility Patches
2. Travel Lane Alligatoring
3. Distortion
4. Rutting
5. Weathering/Block Cracking
6. Transverse and Longitudinal Cracking
7. Bleeding/Polished Aggregate
8. Surface Wear and Raveling
9. Corrugation, Shoving or Slippage

Distress categories 1 to 4 are known as base distresses. These distresses show up in the pavement surface because of a failure in the road base and can only be permanently repaired by reconstruction to the full depth of the road structure. Distress categories 5 to 9 are known as surface distresses. These distresses are generally caused by a failure in the pavement surface due to the result of aging and/or vehicle loading and can be repaired with relatively low cost maintenance methods such as crack sealing or overlaying with a few inches of asphalt.

The average severity and extent of each distress was noted for each section and then input into the software. On completion of the data entry for each section, the software conducted three sets of analyses:

1. Calculation of a Pavement Condition Index (PCI)
2. Assignment of a Repair Strategy
3. Calculation of a Benefit Value

The Pavement Condition Index (PCI) is based upon a scale between 100 (best) and 0 (worst). A section with no distresses will have a PCI equal to 100 and as the number, severity and extent of distresses increase the lower the PCI becomes. A general evaluation of a pavement's condition is as follows:

- **PCI between 95 and 100** means that the pavement is in **Excellent** condition and generally requires no immediate pavement maintenance.
- **PCI between 85 and 94** means that the pavement is in **Good** condition and generally requires minor or no immediate pavement surface maintenance.
- **PCI between 65 and 84** means the pavement is in **Fair** condition and will generally need minor to extensive pavement surface maintenance and/or rehabilitation.
- **PCI between 0 and 64** means the pavement is in **Poor** condition and will generally need extensive rehabilitation or reconstruction.

Repair strategies are assigned to sections through a matrix, which takes into account the PCI, condition of the pavement base associated with the observed surface distresses, the average curb height, functional class and the pavement type. Five generalized repair categories are used. The costs associated with each of these categories were discussed with the Highway Superintendent and provide a fair estimate of the total costs involved in designing, bidding, conducting and overseeing each of the repairs.

The five repair strategies are as follows:

1. **Reconstruction Or Reclamation** (\$30 per sq/yd)
Complete removal and replacement of a failed pavement and base by excavation or reclamation, which may include widening and realignment, installation of drainage and culverts, and safety hardware such as guardrails and signage.
2. **Rehabilitation** (\$10 per sq/yd)
Full depth patching, partial depth patching, joint and crack sealing, grouting and under-sealing, grinding or milling in conjunction with overlays over 2 inches in depth. Edge work and drainage would likely also be required in conjunction with an overlay.
3. **Preventative Maintenance** (\$7.50 per sq/yd)
Localized crack sealing and full/partial depth patching in conjunction with Chip sealing, or Micro Surfacing, or overlays less than 2 inches in depth. Edge work would likely also be required in conjunction with an overlay.
4. **Routine Maintenance** (\$2.50 per sq/yd)
Crack sealing and localized patching.
5. **No Immediate Action** (\$0 per sq/yd)
No maintenance

The existing pavement area (section length multiplied by section width) is multiplied by the assigned repair strategy cost to provide an estimated total cost of conducting the repair on the road section.

The “Benefit Value” (BV) reflects the Cost/Benefit of doing the repair and is used in the budgetary analysis to prioritize sections for repair. There is no scale for the BV, only that those sections with the highest values are more beneficial and cost effective. The following formula is used to calculate the BV.

$$\text{BV} = \frac{365 \times \text{ADT} \times \text{Section Length} \times \text{Estimated Life of Repair}}{\text{Current Cost of Repair} \times \text{Pavement Condition Index}}$$

It can be seen from this formula that roads with higher Average Daily Traffic (ADT) volumes will be assigned higher BV’s, which provides priority for higher volume roads. On roadways where no traffic volume data was available, volumes were estimated based on road use and the number of homes and businesses located along them and with consultation with the Highway Superintendent. Appendix A contains a table of the ADT volumes collected in Shutesbury from 1991 through 2002 by the FRCOG and MassHighway and a corresponding map showing the locations with existing traffic volume data.

Additionally, Routine and Preventative Maintenance repairs receive higher weighting than Rehabilitation and Reconstruction repairs to reflect the principles of pavement management.

Existing Conditions Analysis Results

The following section summarizes the results of the analysis of the existing conditions surveyed in the Fall of 2002. It should be noted that the information contained in the tables and figures was created from a visual evaluation of the pavement surface in which the severity and extent of the observed distresses were estimated. The recommended repair strategies and the associated costs are not final. A more detailed engineering evaluation must be conducted before finalizing any repairs and their associated costs. The information presented here can be used as a tool for preliminary evaluation and prioritization of the paved road network as a whole.

Existing Pavement Conditions

Data collection was conducted in October, 2002. Appendix B contains detailed information on the existing conditions of the paved road network. Table 1 summarizes the results of the pavement management analysis of existing conditions for town maintained paved roadways and Table 2 for the surveyed MassHighway maintained paved roadways, while Map 4 shows the existing conditions broken down into the four condition categories: Excellent, Good, Fair, and Poor for all the surveyed paved roadways.

Overall the conditions of the town maintained paved road network in Shutesbury could be considered as Good, with an average PCI equal to 91. Over half of the paved road network was assessed in Excellent condition and over a quarter in Good condition. The 4% of the paved road network assessed in Poor condition includes the gravel section of Pelham Hill Road the Highway Superintendent indicated maybe paved in the near future and the section of Baker Road west of Schoolhouse Road. The high percentage of roadways in Excellent and Good condition indicates that Shutesbury has done a very good job of maintaining its paved road network.

Table 1: Summary of Existing Pavement Conditions for Town Maintained Paved Roads

PAVEMENT CONDITION (PCI Range)	Number of Miles	% of Total Mileage
Excellent (≥ 95)	8.10	53%
Good ($85 \leq \leq 94$)	4.54	29%
Fair ($65 \leq \leq 84$)	2.17	14%
Poor (< 65)	0.64	4%
Total Mileage		15.45

Overall, the conditions of the MassHighway maintained paved road network in Shutesbury could be considered as Good, with an average PCI equal to 91. Much of Route 202 through Shutesbury was recently crack sealed, bringing the pavement condition back to a Good condition.

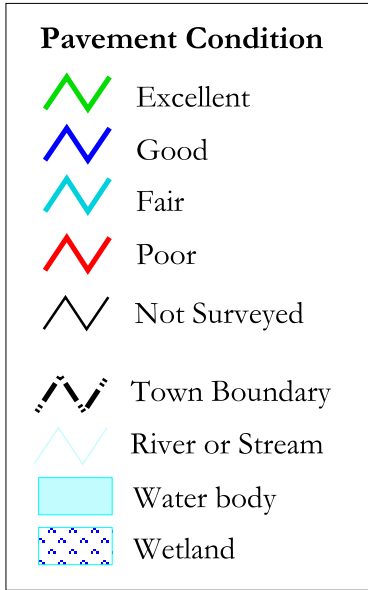
Table 2: Summary of Existing Pavement Conditions for Surveyed MassHighway Maintained Paved Roads

PAVEMENT CONDITION (PCI Range)	Number of Miles	% of Total Mileage
Excellent (≥ 95)	1.00	32%
Good ($85 \leq \leq 94$)	2.08	66%
Fair ($65 \leq \leq 84$)	0.08	2%
Poor (< 65)	0.00	0%
Total Mileage		3.16

TOWN OF SHUTESBURY PAVEMENT MANAGEMENT STUDY

SCENARIO 1

Map 4 - Existing Pavement Conditions

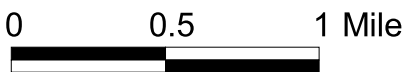
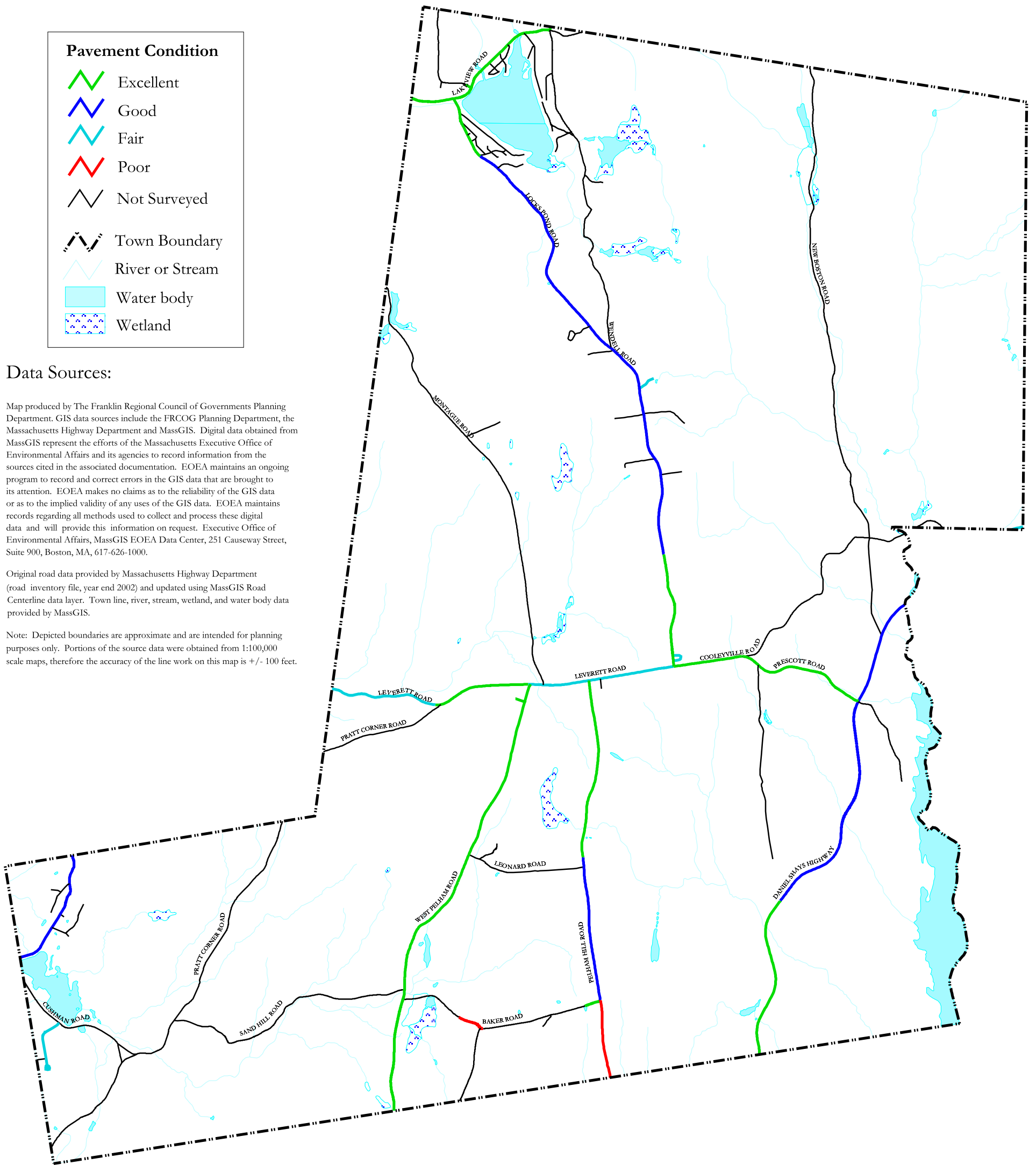


Data Sources:

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Assignment of Repair Strategies

Now that the existing conditions have been documented and road segments have been grouped into the four condition categories, a breakdown of recommended repairs and estimated costs of repairs has been calculated. This information is summarized in Table 3 for town maintained paved roads. This table includes the results of a calculation called “Backlog of Repair”. The Backlog of Repair reflects the estimated cost of conducting all the prescribed repairs to bring the paved network up to an Excellent condition. This Backlog of Repair is estimated to equal \$256,085 for town maintained paved roadways. It should be noted that this backlog does not reflect the proposed \$1.5 million reconstruction of Leverett, Cooleyville and Prescott Roads. It does reflect any repairs that are currently prescribed by the analysis for these road sections based on the surface survey. The majority (70%) of the Town’s Backlog of Repair is accounted for by three road segments totaling 1.34 miles deemed by the analysis software to require a rehabilitation repair. These three segments are the segments of Pelham Hill Road (identified by the Highway Superintendent to be possibly paved in the future) and Baker Road in Poor condition and the segment of Leverett Road between Pratt Corner Road and the Leverett Town Line listed in Fair condition.

The distribution of the mileage indicates that the Town has been following good pavement management practices in that almost 90% of the mileage requires either no immediate action or routine maintenance.

Table 3: Summary of Suggested Repairs for Town Maintained Paved Roads

REPAIR TYPE	Number of Miles	% of Total Mileage	Estimated Cost of Repair
5. No Immediate Action	12.64	82%	\$0
4. Routine Maintenance	1.01	6%	\$32,458
3. Preventative Maintenance	0.46	3%	\$43,913
2. Rehabilitation	1.34	9%	\$179,714
1. Reconstruction	0.00	0%	\$0
Total Mileage	15.45		Backlog of Repair = \$256,085

Table 4 summarizes the suggested maintenance needs of the surveyed MassHighway maintained roadways. It appears that Route 202 through Shutesbury is undergoing maintenance, as some of the roadway has recently been crack sealed. It is likely that crack sealing will be completed on the remaining sections of roadway this coming year. The Backlog of Repair for the MassHighway maintained roadways in Shutesbury has been assessed at \$88,457.

Table 4: Summary of Suggested Repairs for MassHighway Maintained Paved Roads

REPAIR TYPE	Number of Miles	% of Total Mileage	Estimated Cost of Repair
5. No Immediate Action	1.00	32%	\$0
4. Routine Maintenance	2.08	66%	\$79,314
3. Preventative Maintenance	0.08	2%	\$9,143
2. Rehabilitation	0.00	0%	\$0
1. Reconstruction	0.00	0%	\$0
Total Mileage	3.16		Backlog of Repair = \$88,457

Calculation of a Benefit Value

Of the 28 town maintained road sections surveyed, only 7 (2.81 miles) require some form of repair. The remaining 21 (12.64 miles) sections require no immediate maintenance. As mentioned previously, a Benefit Value (BV) reflects the Cost/Benefit of doing a suggested repair, and is used to help prioritize sections for repair. There is no scale for the BV, but sections with the highest values are generally more beneficial and cost effective. BV can then be translated into a ranking system to indicate repair priorities. It should be noted that this ranking system does not take into account social factors such as the need to maintain suitable emergency vehicle access.

Therefore, the roadway section with the highest BV has received a rank of 1 and the lowest has received a rank of 7. Appendix B contains this information for all surveyed road sections. Table 5 on the next page shows the seven sections requiring repair in prioritized order according to the calculated Benefit Value.

Because of the limited number of road segments requiring repair and wide variations in traffic volumes it is difficult to see the standard pattern that generally occurs with the ranking. Generally, to reflect the principles of pavement management, roadways requiring routine and preventative maintenance would dominate the top ten list. In Shutesbury’s case the number one ranked project is a routine maintenance repair on Leverett Road, but because of the influence of traffic volumes in the benefit value calculation the next three ranked segments are rehabilitation repairs.

Table 5: Top 7 Town Maintained Road Sections for Repair

Street Name	Section ID#	Section From:	Section To:	Length (ft)	PCI	Repair Code	Estimated Cost	Rank	Estimated ADT	Survey Date
Leverett Road*	1	Wendell Road	Montague Road	4752	84	4	\$30,360	1	2000	10/17/02
Leverett Road*	3	Pratt Corner Road	Leverett Town Line	3696	78	2	\$98,560	2	2000	10/17/02
Baker Road	3	Schoolhouse Road	Gravel	898	55	2	\$14,967	3	200	10/21/02
Pelham Hill Road ¹	3	Baker Road	Pelham Town Line	2482	**	2	\$66,187	3	300	-
Weather-wood Road	1	Cushman Road	Cul-de-sac	1848	65	3	\$40,040	5	50	10/21/02
Town Common	1	Wendell Road	Wendell Road	581	66	3	\$3,873	6	5	10/17/02
Stowell Road	1	Wendell Road	Dead End	581	74	4	\$2,098	7	5	10/17/02

¹ – Section currently has a gravel surface. The Highway Superintendent has indicated that it may be paved in the future, therefore, was assigned a rehabilitation repair.

Street Name - Street Name. * Indicates the road section is eligible to receive Federal Aid or Non-Federal Aid for Reconstruction only.

Section From - Start point of the individual section.

Section To - End point of the individual section.

Length (ft) - The length of the section, measured in feet.

PCI - Pavement Condition Index: 95 - 100 indicates the pavement is in **Excellent** condition,
 85 - 94 indicates the pavement is in **Good** condition;
 65 - 84 indicates the pavement is in **Fair** condition;
 0 - 64 indicates the pavement is in **Poor** condition.

** - Currently gravel surface identified for paving in the near future

Repair Code - 1. Reconstruction; (\$30 sq/yd)
 2. Rehabilitation; (\$10 sq/yd)
 3. Preventative Maintenance; (\$7.50 sq/yd)
 4. Routine Maintenance; (\$2.50 sq/yd)
 5. No Immediate Maintenance. (\$0 sq/yd)

Rank - A ranking of all the sections requiring repair, based on a cost/benefit produced by the RoadManager software through the Benefit Value. The section with the highest Benefit Value has received a PMS Ranking of 1. Sections with equal Benefit Values have received the same ranking. In total there are 28 ranked sections.

Estimated ADT - Average Daily Traffic traveling on each section of road. Generally, traffic count data was available on the higher volume roads. Where data was not available, estimates were made based on the functionality of the road and the number of houses or businesses they served.

Survey Date - Date on which the pavement distress data was collected.

Budgetary Analysis

Existing Funding Levels

The primary source of funding for road repairs and reconstruction in the Town of Shutesbury is its Chapter 90 allocation from the State. Each municipality in the Commonwealth receives Chapter 90 funding through the Transportation Bond. Funding levels are based on a formula that takes into account the number of miles of town maintained roadways, population, and level of employment. Approved Chapter 90 projects are 100% reimbursable. However, a town must receive written approval from their MassHighway District Director before beginning a project. Eligible Chapter 90 projects are highway construction or improvement projects that extend the life of a roadway or bridge. Other eligible Chapter 90 uses are engineering services for projects on the TIP or other transportation projects, pavement management services, and the purchase of road machinery, equipment, or tools.

The Town of Shutesbury's allocation of Chapter 90 funding for FY 2003 totaled approximately \$71,000. Even though Massachusetts is currently facing a budget crisis where many programs are facing cuts in funding, when this analysis was conducted in April 2003 there was no indication the current \$100 million statewide Chapter 90 program would be reduced. According to the Highway Superintendent, the Town of Shutesbury generally uses its full Chapter 90 allocation for maintenance of its paved road network.

Roadways that are functionally classified as a Major Collector or higher are eligible to receive Federal Aid and Non-Federal Aid for reconstruction projects through the Transportation Improvement Program (TIP). An explanation of the TIP process appears later in this report. Town maintained roadways eligible for this funding source are: Lakeview Road, Locks Pond Road, Wendell Road, Leverett Road, Cooleyville Road and Prescott Road. The Town has been pursuing TIP funding for the reconstruction of Leverett, Cooleyville and Prescott Roads, but issues over the design required by MassHighway had stalled this project. Recently, this project was identified by the Franklin Regional Council of Governments in cooperation with the Town, as its initial project for MassHighway's Footprint Road Program. The Footprint Road Program, still under development, is intended to allow road projects that make improvements within the existing paved footprint of the road to be funded through the TIP process if certain criteria are met. At this time, because the Town needs to find \$100,000 to complete the design for this project, it is unclear if this project will move forward through this process. If it were to move forward, this project has been scheduled in the TIP for advertisement in FY 2004 and would likely be constructed in 2005. A pavement overlay was applied to this roadway a couple of years ago to provide a suitable riding surface and prevent further deterioration of the road structure in the meantime. It appears from the pavement surface survey that apart from one segment of Leverett Road that this repair is holding together well.

The Town has also appropriated its own funds towards repairs and upkeep of both the gravel and paved road network in the past, but with the tightening financial situation, this may not continue into the future.

The RM software can be used to predict the potential effect funding levels will have on the future conditions of the paved road network. The RM software creates a prioritized list of sections requiring repair by ranking them based on the BV. When assigning funds to repair sections of roadway, the software starts at the top of the ranked list and works its way down. As the budget limit nears and the next ranked section has too high a cost to remain within the budget, the software continues to scan down the list, choosing sections for repair until the budget limit is reached or there are no more ranked sections. Those sections chosen for repair then assume a PCI of 99 (Excellent condition). For planning and forecasting purposes, those sections not selected are then evaluated by the software based on performance curves developed from research into the life cycles of pavements under differing traffic loading characteristics. The performance curves resemble the generic curve shown in figure 1 at the beginning of the report. Each year that a section is not chosen for repair, its PCI value drops down the curve. At the end of each year, the repair strategies are reassigned based on the decreased PCI and the costs and BVs are recalculated producing a new list of ranked sections for the next year's budget allocation.

To predict the potential impacts the existing funding projections will have on the condition of the town maintained paved road network over a ten-year period between 2003 and 2012, a budgetary analysis was run using the following assumptions developed in cooperation with the Highway Superintendent:

- In 2003 the Highway Superintendent would like to complete the following repairs using a mixture of Chapter 90 and Town appropriated funds:
 - Baker Road, from Schoolhouse Road to gravel – Full depth reclamation and chip seal, \$15,000
 - Weatherwood Road, from Cushman Road to cul-de-sac – Full depth reclamation and chip seal, \$50,000
 - January Hills Road from Amherst Town Line to Leverett Town Line– Double chip seal, \$30,000
 - Town Common Drive – Regrade base and chip seal, \$3,500
- The Highway Superintendent would like to combine the 2004 Chapter 90 allocation with Chapter 90 funds carried over from previous years to pave the current gravel section of Pelham Hill Road between Baker Road and the Pelham Town Line, which he estimates would cost approximately \$100,000.
- The reconstruction of Leverett Road, Cooleyville Road and Prescott Road under the Footprint Road Program will be completed in 2005 at a cost of \$1.5 million.
- Chapter 90 funds for 2003 through 2005 would be allocated to the projects listed above. From 2006 to 2012 the existing annual allocation of \$71,000 of Chapter 90 funding would be available for paved road maintenance.

For each future year of the analysis, output from the software provides a list of the projects allocated funding and also allows for the calculation of a number of benchmark measures such as Backlog of Repair, miles per repair category, and average PCI for the whole road network.

Table 6 provides a general projection of the future condition of the paved road network that could be expected under the above funding assumptions. It can be seen from this table that the

average condition of the road network would likely decline from an existing PCI of 91 (Good) to 86 (Good), and the Backlog of Repairs could increase by over \$300,000 to approximately \$600,000 over the ten-year period. It should be noted that this analysis does not account for inflation.

Table 6: Projected Backlog of Repair and Average PCI to 2012 with Existing Funding Levels

Future Year	Funding Level	Backlog of Repair	Average PCI
2002	Existing Conditions	\$256,085	91
2003	\$98,500 ¹	\$228,507	93
2004	\$100,000 ²	\$323,783	91
2005	\$1,500,000 ³	\$311,665	93
2006	\$71,000	\$276,434	92
2007	\$71,000	\$320,432	90
2008	\$71,000	\$249,973	90
2009	\$71,000	\$303,064	89
2010	\$71,000	\$265,032	88
2011	\$71,000	\$334,346	85
2012	\$71,000	\$595,622	86

¹ – Assumes repairs to Baker Road (\$15,000), Weatherwood Road (\$50,000), January Hills Road (\$30,000) and Town Common Road (\$3,500)

² – Assumes conversion of Pelham Hill Road south of Baker Road from gravel to pavement (\$100,000)

³ – Assumes reconstruction of Leverett, Cooleyville and Prescott Roads (\$1.5 million)
Total Funding allocated over ten years equals \$2,195,500

Table 7 provides a comparison between the existing conditions and the projected conditions of the paved road network in 2012 under the existing funding assumptions. This comparison shows that the mileage of roadways in Excellent condition may see a significant decline. The majority of this decline would go to a Good condition, with smaller increases in Fair and Poor conditions.

Table 7: Comparison of Existing and Projected Pavement Conditions for Town Maintained Paved Roads in 2012 with Existing Funding Levels

PAVEMENT CONDITION (PCI Range)	Existing 2002 Mileage	Projected 2012 Mileage	Change in Mileage
Excellent (>=95)	8.10	3.24	-4.86
Good (85<=>94)	4.54	7.76	3.22
Fair (65<=>84)	2.17	3.07	0.90
Poor (<65)	0.64	1.38	0.74
Total Mileage	15.45	15.45	

Tables 8 and 9 show the projected change in assigned repair strategies and estimated Backlog of Repair for the road sections analyzed to 2012 under existing funding levels. These tables show half the mileage requiring no immediate action in 2012 compared to 2002, with a similar mileage increase in roads requiring routine maintenance. Mileage requiring preventative maintenance

and rehabilitation show small decreases, while a half-mile section of roadway declines to a point where a reconstruction repair is prescribed. The large increase in mileage requiring routine maintenance accounts for much of the approximately \$300,000 increase in the Backlog of Repair.

Table 8: Comparison of Existing and Projected Required Repairs for Town Maintained Paved Roads in 2012 with Existing Funding Levels

REPAIR TYPE	Existing 2002 Mileage	Projected 2012 Mileage	Change in Mileage
5. No Immediate Action	12.64	6.32	-6.32
4. Routine Maintenance	1.01	7.75	6.74
3. Preventative Maintenance	0.46	0.00	-0.46
2. Rehabilitation	1.34	0.88	-0.46
1. Reconstruction	0.00	0.50	0.50
Total Mileage	15.45	15.45	

Table 9: Comparison of Existing and Projected Backlog of Repairs for Town Maintained Paved Roads in 2012 with Existing Funding Levels

REPAIR TYPE	Existing 2002 Backlog	Projected 2012 Backlog	Change in Backlog
5. No Immediate Action	\$0	\$0	\$0
4. Routine Maintenance	\$32,458	\$259,004	\$226,546
3. Preventative Maintenance	\$43,913	\$0	-\$43,913
2. Rehabilitation	\$179,714	\$134,218	-\$45,496
1. Reconstruction	\$0	\$202,400	\$202,400
Total Backlog of Repair	\$256,085	\$595,622	\$339,537

This analysis shows that even with the additional investment in 2003, 2004 and 2005, the existing Chapter 90 finding level would not be sufficient to even maintain the road network at its existing condition. The Backlog of Repair remains reasonably stable through 2010, but by 2012 many of the roads improved in the early years would be at a point where routine maintenance would be required and the Chapter 90 is not sufficient to complete all the required repairs. This means that from 2012 and beyond, the paved road network would begin to see an accelerated decline in condition.

Increased Chapter 90 Funding

In the late 1990s, the statewide Chapter 90 program was funded at a \$150 million level, which equated to approximately \$106,500 in Chapter 90 funding to the Town of Shutesbury. Since this program was reduced to the \$100 million level there have been many efforts to restore the program to its original \$150 million level. Unfortunately, these efforts have thus far failed and seem less likely than ever to be successful given the current economic climate in Massachusetts.

However, to illustrate the difference that an increase in Chapter 90 funding would make to the future condition of the paved road network, a new analysis was conducted using the following assumptions:

- In 2003 the Highway Superintendent would like to complete the following repairs using a mixture of Chapter 90 and Town appropriated funds:
 - Baker Road, from Schoolhouse Road to gravel – Full depth reclamation and chip seal, \$15,000
 - Weatherwood Road, from Cushman Road to cul-de-sac – Full depth reclamation and chip seal, \$50,000
 - January Hills Road from Amherst Town Line to Leverett Town Line– Double chip seal, \$30,000
 - Town Common Drive – Regrade base and chip seal, \$3,500
- The Highway Superintendent would like to combine the 2004 Chapter 90 allocation with Chapter 90 funds carried over from previous years to pave the current gravel section of Pelham Hill Road between Baker Road and the Pelham Town Line, which he estimates would cost approximately \$100,000.
- The reconstruction of Leverett Road, Cooleyville Road and Prescott Road under the Footprint Road Program will be completed in 2005 at a cost of \$1.5 million.
- Chapter 90 funds for 2003 through 2005 would be allocated to the projects listed above. From 2006 to 2012 the increased annual allocation of \$106,500 of Chapter 90 funding to reflect a \$150 million statewide program would be available for paved road maintenance.

Table 10 summarizes the projected conditions of the paved road network using the above funding assumptions that reflects an increase in Chapter 90 funding as if the former \$150 million program was back in place. It can be seen from this table that under these funding levels the average condition of the paved road network would hover around the existing Good conditions and in 2012 it would have slightly improved. The Backlog of Repairs declines by over \$100,000 over the ten-year period, even declining to as low as \$30,000 in 2010. It should be noted that this analysis does not account for inflation.

Table 10: Projected Backlog of Repair and Average PCI to 2012 with Increased Chapter 90 Funding.

Future Year	Funding Level	Backlog of Repair	Average PCI
2002	Existing Conditions	\$256,085	91
2003	\$98,500 ¹	\$228,507	93
2004	\$100,000 ²	\$323,873	91
2005	\$1,500,000 ³	\$311,665	93
2006	\$106,500	\$276,434	92
2007	\$106,500	\$224,292	91
2008	\$106,500	\$153,833	92
2009	\$106,500	\$100,663	92
2010	\$106,500	\$29,435	92
2011	\$106,500	\$130,796	90
2012	\$106,500	\$155,251	93

¹ – Assumes repairs to Baker Road (\$15,000), Weatherwood Road (\$50,000), January Hills Road (\$30,000) and Town Common Road (\$3,500)

² – Assumes conversion of Pelham Hill Road south of Baker Road from gravel to pavement (\$100,000)

³ – Assumes reconstruction of Leverett, Cooleyville and Prescott Roads (\$1.5 million)

Total Funding allocated over ten years equals 2,444,000

Table 11 provides a comparison between the existing conditions and the projected conditions of the paved road network in 2012 under the above funding assumptions that reflects an increase in Chapter 90 funding as if the former \$150 million program was back in place. This comparison shows minor changes in mileage in each of the condition categories, resulting in no roadways in Poor condition.

Table 11: Comparison of Existing and Projected Pavement Conditions for Town Maintained Paved Roads in 2012 with Increased Chapter 90 Funding

PAVEMENT CONDITION (PCI Range)	Existing 2002 Mileage	Projected 2012 Mileage	Change in Mileage
Excellent (=>95)	8.10	7.58	-0.52
Good (85<=>94)	4.54	5.90	1.36
Fair (65<=>84)	2.17	1.97	-0.20
Poor (<65)	0.64	0.00	-0.64
Total Mileage	15.45	15.45	

Table 12: Comparison of Existing and Projected Required Repairs for Town Maintained Paved Roads in 2012 with Increased Chapter 90 Funding

REPAIR TYPE	Existing 2002 Mileage	Projected 2012 Mileage	Change in Mileage
5. No Immediate Action	12.64	10.71	-1.93
4. Routine Maintenance	1.01	4.74	3.73
3. Preventative Maintenance	0.46	0.00	-0.46
2. Rehabilitation	1.34	0.00	-1.34
1. Reconstruction	0.00	0.00	0.00
Total Mileage	15.45	15.45	

Table 13: Comparison of Existing and Projected Backlog of Repairs for Town Maintained Paved Roads in 2012 with Increased Chapter 90 Funding

REPAIR TYPE	Existing 2002 Backlog	Projected 2012 Backlog	Change in Backlog
5. No Immediate Action	\$0	\$0	\$0
4. Routine Maintenance	\$32,458	\$155,251	\$122,793
3. Preventative Maintenance	\$43,913	\$0	-\$43,913
2. Rehabilitation	\$179,714	\$0	-\$179,714
1. Reconstruction	\$0	\$0	\$0
Total Backlog of Repair	\$256,085	\$155,251	-\$100,834

Tables 12 and 13 show the projected assigned repair strategies and Backlog of Repair for the road sections analyzed to 2012 under the above funding assumptions that reflect an increase in Chapter 90 funding as if the former \$150 million program was back in place. It can be seen that all roads are projected to need either no maintenance or only routine maintenance in 2012. This indicates that the increased funding provides sufficient resources to keep pace with the maintenance needs of the paved road network. This results in a decrease of approximately \$100,000 between the existing Backlog of Repair and the projected Backlog of Repair in 2012.

This analysis shows that if the Chapter 90 funding levels were raised back to the \$150 million program levels, the decline in the paved road network condition would most likely be halted, and in fact, would bring the paved road network to a condition where it is being maintained in an Excellent to Good condition. This means the investment for reconstruction that has already been made and will be made in the future will be protected. The additional Chapter 90 funds amount to almost \$250,000 applied to pavement maintenance over the ten years, and produces a reduction in Backlog of Repair of \$100,000 over existing conditions. This is, in fact, a net reduction in the projected Backlog of Repair of almost \$440,000 compared to the projected \$339,537 increase in Backlog of Repair under the existing Chapter 90 funding levels, therefore, providing a \$190,000 return in the additional \$250,000 investment.

Conclusion

Based on the pavement surface survey conducted in the fall of 2002 the paved road network maintained by the Town of Shutesbury is currently in “Good” condition with an average pavement condition index (PCI) of 91. The distribution of the mileage by repair type indicates that the Town’s highway department has been practicing good pavement management practices with the funding that has been available. The analysis indicates that the existing levels of funding provided through Chapter 90, the primary source of road maintenance funds, are insufficient to maintain the paved road network in its present condition. The analysis using the existing funding sources and levels, projects that the overall condition of the paved road network will decline. In addition, it shows that the all the required repairs cannot be completed each year resulting in some roads deteriorating to a point where more costly repairs are required, compounding the situation further. The analysis predicts that the Backlog of Repairs would increase by approximately \$340,000 over the ten years analyzed.

An additional analysis was conducted to project the potential improvements that could be achieved if the Chapter 90 funding was increased back to the levels seen in the late 1990s when a \$150 million statewide program was in effect. The analysis indicates that this increase in funding would be sufficient to maintain and improve the condition of the paved road network, keeping the network in a perpetual Good to Excellent condition. The additional \$250,000 investment over ten years provided by an increase in Chapter 90 funding would result in a net reduction of \$440,000 million in the Backlog of Repairs, producing a \$190,000 return on the additional \$250,000 investment.

In these current economic times it will be difficult to leverage additional funds, but with Governor Romney’s new Road and Bridge Policy of “Fix It First”, this report could be used as justification when lobbying for additional funding now or in the future. The Town now has the base data that will allow it to monitor its progress with maintaining the paved road network through the regular survey (ideally biannually) of its paved road network and the FRCOG will continue to provide support to the extent possible.

Alternative Funding Sources

Transportation Improvement Program

The Town of Shutesbury already does an excellent job at utilizing alternative funding sources. Approximately nine miles of the paved road network is functionally classified as Rural Minor Arterial and Rural Major Collector making these road sections eligible for Federal Aid funds for reconstruction under the Transportation Improvement Program (TIP). The TIP is a prioritized, fiscally constrained listing of all transportation projects in the region eligible to receive federal funding. The TIP is created every year and lists projects for the six upcoming federal fiscal years. The federal fiscal year runs from October 1 to September 30. The FRCOG is responsible for the creation and maintenance of the TIP. The creation and maintenance of the TIP is mandated by the Federal Highway Administration (FHWA). In addition, the FHWA requires that the federal aid portion of the TIP be fiscally constrained and only list projects within the funding levels expected for the subject TIP year.

To the extent possible, non-federal aid (excluding Chapter 90) projects are also included in the TIP, allowing a more complete picture of transportation needs in the region to be reflected. Regional Planning Agencies are working closely with their MassHighway Districts to prioritize and fiscally constrain non-federal aid projects and provide a realistic picture of non-federal aid funding availability.

The Franklin Regional Council of Governments solicits TIP projects each year from Franklin County Towns. At the same time, the FRCOG asks the Towns to provide a status report of projects already on the TIP. Additionally, the FRCOG contacts both MassHighway Districts for a listing of new projects and for the status of existing projects. With this information, projects are placed in the appropriate fiscal year of the TIP. The Franklin Regional Planning Board Transportation Subcommittee is responsible for prioritizing all of the projects in each fiscal year. The ranking procedure is based on the regional and local priority of each project and the status of the project's design and permitting. The Franklin Regional Planning Board (FRPB) then considers the recommendations of the FRPB Transportation Subcommittee before voting to approve the TIP for that period. The TIP is then reviewed at MassHighway Planning in Boston before being officially endorsed by the FRCOG Executive Committee, the Franklin Regional Transit Authority (FRTA), the Greenfield-Montague Transportation Area (GMTA), the Commissioner of MassHighway and the Secretary of the Executive Office of Transportation and Construction.

Bridge projects listed on the TIP are designed, engineered and constructed by MassHighway. Towns usually do not get involved in bridge projects, unless the project design is unacceptable to the Town. For bridges, the Town's responsibilities are to: (1) attend all design public hearings; and (2) acquire any necessary rights-of-way. For road projects initiated by the Town, the Town is responsible for the design and engineering of the project. Design and engineering is a Chapter 90 reimbursable cost once the Town has received approval for the project from the MassHighway District and the MassHighway Project Review Committee.

Towns sometimes view the TIP route of funding unfavorably, due to the small regional funding targets in recent years, and the length of time it can take to work through the process.

An additional concern of using this funding source is often these projects must meet MassHighway Design Standards, which in the past has meant designs with wider roadways requiring land takings, tree removal and a resulting impact to an area's rural appearance. In 1997 MassHighway produced the Low Speed/Low Volume Design Standards, which allow for narrower travel lane widths and shoulders for roadways with speeds less than 40mph and traffic volumes of less than 2000 vehicles per day. It had been hoped that these standards could be applied to the Leverett, Cooleyville, Prescott Roads reconstruction but the projected future traffic volumes on Leverett Road were in excess of the 2000 vehicles per day threshold.

That being said, MassHighway is currently piloting a new program, the Footprint Roads Program which, if fully adopted will allow communities to use the TIP process while still maintaining the existing roadway footprint. The Leverett, Cooleyville, Prescott Road project has been identified by the FRCOG as its regional pilot project for the program. For additional details on this program, call Maureen Mullaney, FRCOG Transportation Program Manager at 413-774-1194 (Ext 108).

The Public Works Economic Development Program

The Public Works Economic Development (PWED) Program was established through and is funded by the Transportation Bond. It provides funding to assist Towns in their efforts to create economic development through infrastructure improvement projects.

Eligible PWED projects include roadway and bridge improvements, sidewalk or lighting installation, traffic control facilities, and drainage or culvert work. The project must, however, retain, expand or establish industrial or commercial facilities, create or retain long-term employment opportunities, have a positive impact on the local tax base, or strengthen the partnership between the public and private sector. Ineligible PWED projects include sewage systems, water systems, or projects on which construction has been initiated. PWED projects cannot exceed \$1 million unless the Secretary of the Executive Office of Transportation and Construction deems the project to have regional impact.

Funding for the PWED program is allocated on a first come-first served basis. The total cost of a PWED project is funded, there is no local match requirement. Towns interested in pursuing a PWED project should contact the transportation planning staff at the Franklin Regional Council of Governments for an application.

The Small Town Road Assistance Program

The Small Town Road Assistance Program (STRAP) was established through and is funded by the Transportation Bond. It provides funding to towns with populations less than 3,500 for transportation improvement projects.

Eligible STRAP projects are transportation projects that improve public safety or emphasize economic development. Right-of-way takings cannot be funded with STRAP funds. Projects cannot exceed \$500,000. Towns approved to receive STRAP funds will receive 70% of the total cost of the project as a grant. The remaining project cost (30%) is given to the town in the form of a loan which the town must repay within ten years of the project's completion. The Massachusetts Department of Revenue arranges the repayment plan. The loan payment is deducted from the town's Local Aid Cherry Sheet over the ten year period. A town may receive a STRAP grant once every five years. STRAP funding is allocated on a first come-first served basis. Applications for STRAP funding are available at the MassHighway District offices. However, STRAP application submittals should be sent directly to the Secretary of the Executive Office of Transportation and Construction at the Transportation Building, Ten Park Plaza, Suite 3170, Boston, MA 02116.

Conclusion

In the absence of an annual \$150 million Chapter 90 program, the Town should continue to explore and utilize alternative funding sources to ensure that the existing conditions can be maintained, and possibly improved.

Appendices

Appendix A

Average Annual Daily Traffic (AADT) Count Data 1991-2002 For the Town of Shutesbury

Appendix A: Average Annual Daily Traffic (AADT) Count Data 1991-2002

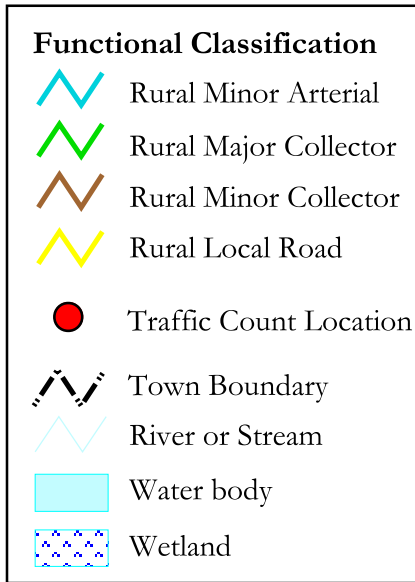
StationID	Street/Route	Location	Average Annual Daily Traffic (AADT) Volumes											
			1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
2720001	Baker Road	Btwn West Pelham Road & Pelham Hill Road	200											
2720020	Cushman Road	200ft West of Cross Road												170
2720019	Cushman Road	Amherst Town Line												230
2720002	Lakeview Road	Btwn Locks Pond Road & Farrar Road	740						810			920		
2720003	Leverett Road	³ / ₁₀ mile East of Pratts Corner Road	1380					1620			1680	1620		
2720016	Leverett Road	Btwn Pelham Hill Road & Wendell Road										1750		
2720004	Locks Pond Road	¹ / ₄ mile North of Old Orchard Road							570			620		
2720017	Montague Road	¹ / ₁₀ mile North of Leverett Road											450	
2720013	Montague Road	¹ / ₄ mile South of Dudleyville	560						150					
2720005	Montague Road	¹ / ₄ mile South of Leverett Town Line			170								170	200
2720006	Pelham Hill Road	200ft South of Baker Road	340						310			300		280
2720012	Pelham Hill Road	500ft North of Baker Road									340			
2720018	Pelham Hill Road	¹ / ₁₀ mile South of Leverett Road												400
2720007	Prescott Road	¹ / ₁₀ mile West of Route 202						800				810		
2720015	Route 202	² / ₁₀ mile North of Pelham Town Line										3200	3300	2800
2720008	Schoolhouse Road	South of Baker Rd	120											
2720014	Wendell Road	Wendell Town Line			800				670		740			730
2720009	Wendell Road	⁶ / ₁₀ mile North of Leverett Road	600					810			910	890		
2720010	West Pelham Road	200ft South of Leverett Road							840			810		
2720011	West Pelham Road	³ / ₄ mile South of Leverett Rd	660						520			630		

Source: Franklin Regional Council of Governments Traffic Count Database

TOWN OF SHUTESBURY PAVEMENT MANAGEMENT STUDY

SCENARIO 1

Appendix A - Traffic Count Locations

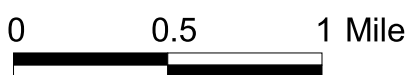
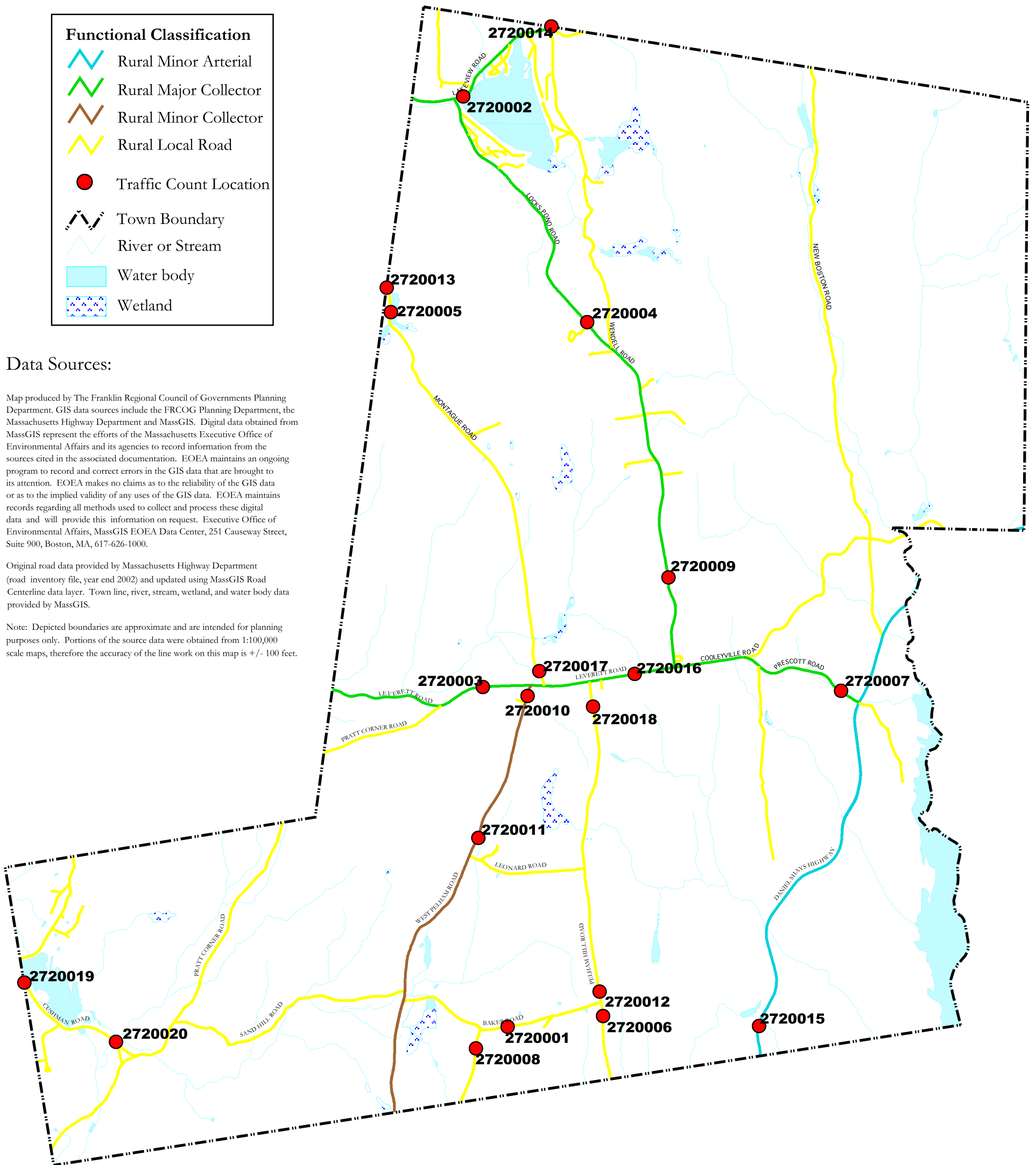


Data Sources:

Map produced by The Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, the Massachusetts Highway Department and MassGIS. Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. EOEa maintains an ongoing program to record and correct errors in the GIS data that are brought to its attention. EOEa makes no claims as to the reliability of the GIS data or as to the implied validity of any uses of the GIS data. EOEa maintains records regarding all methods used to collect and process these digital data and will provide this information on request. Executive Office of Environmental Affairs, MassGIS EOEa Data Center, 251 Causeway Street, Suite 900, Boston, MA, 617-626-1000.

Original road data provided by Massachusetts Highway Department (road inventory file, year end 2002) and updated using MassGIS Road Centerline data layer. Town line, river, stream, wetland, and water body data provided by MassGIS.

Note: Depicted boundaries are approximate and are intended for planning purposes only. Portions of the source data were obtained from 1:100,000 scale maps, therefore the accuracy of the line work on this map is +/- 100 feet.



Appendix A: Average Annual Daily Traffic (AADT) Count Data 1991-2002

Appendix B
Existing Pavement Conditions
Analysis Results

Appendix B: Glossary of Terms for Data Format

Street Name - Street Name prefixed with the Municipalities three digit code.

* Indicates the road section is eligible to receive Federal Aid for Reconstruction.

Section From - Start point of the individual section.

Section To - End point of the individual section.

Length (ft) - The length of the section, measured in feet.

PCI - Pavement Condition Index 95 - 100 indicates the pavement is in **Excellent** condition,
85 - 94 indicates the pavement is in **Good** condition;
65 - 84 indicates the pavement is in **Fair** condition;
0 - 64 indicates the pavement is in **Poor** condition.

Repair Code - 1. Reconstruction; (\$30 sq/yd)
 2. Rehabilitation; (\$10 sq/yd)
 3. Preventative Maintenance; (\$7.50 sq/yd)
 4. Routine Maintenance; (\$2.50 sq/yd)
 5. No Immediate Maintenance. (\$0 sq/yd)

PMS Ranking - A ranking of all the sections requiring repair, based on a cost/benefit produced by the RoadManager software through the Benefit Value. The section with the highest Benefit Value has received a PMS Ranking of 1. Sections with equal Benefit Values have received the same ranking. In total there are 146 ranked sections.

Estimated ADT - Average Daily Traffic traveling on each section of road. Generally, traffic count data was available on the higher volume roads. Where data was not available, estimates were made based on the functionality of the road and the number of houses or businesses they served.

Survey Date - Date on which the pavement distress data was collected.

NOTE:

The information contained in these tables was created from a visual evaluation of the pavement surface in which the severity and extent of the observed distresses were estimated. The recommended repair strategies and the associated costs are not final. A more detailed engineering evaluation must be conducted before finalizing any repairs and their associated costs. The information presented here can be used as a tool for preliminary evaluation and prioritization of the paved road network as a whole.

Appendix B: Existing Pavement Conditions (Fall 2002)
Alphabetical List of Town Maintained Paved Roads

STREET NAME	SECTION	SECTION FROM:	SECTION TO:	LENGTH (ft)	PCI	REPAIR CODE	ESTIMATED COST	PMS RANK	ESTIMATED ADT	SURVEY DATE
	ID #									
BAKER ROAD	1	PELHAM HILL ROAD	GRAVEL	528	100	5	\$0		200	10/21/02
BAKER ROAD	3	SCHOOL HOUSE ROAD	GRAVEL	898	55	2	\$14,967	3	200	10/21/02
COOLEYVILLE ROAD	2	PRESCOTT ROAD	WENDELL ROAD	2165	99	5	\$0		1000	10/17/02
FARRAR ROAD	1	LAKEVIEW ROAD	GRAVEL	211	99	5	\$0		100	10/17/02
JANUARY HILLS RD.	1	AMHERST TOWN LINE	LEVERETT TOWN LINE	4066	88	5	\$0		250	10/21/02
LAKEVIEW ROAD	1	WENDELL ROAD	PARK ENTRANCE	2640	100	5	\$0		1000	10/17/02
LAKEVIEW ROAD	2	PARK ENTRANCE	LEVERETT TOWN LINE	2851	98	5	\$0		1000	10/17/02
LEVERETT ROAD	1	WENDELL ROAD	MONTAGUE ROAD	4752	84	4	\$30,360	1	2000	10/17/02
LEVERETT ROAD	2	MONTAGUE ROAD	PRATT CORNER ROAD	3168	99	5	\$0		2000	10/17/02
LEVERETT ROAD	3	PRATT CORNER ROAD	LEVERETT TOWN LINE	3696	78	2	\$98,560	2	2000	10/17/02
LOCKS POND ROAD	1	LAKEVIEW ROAD	GREAT PINES ROAD	2112	95	5	\$0		750	10/17/02
LOCKS POND ROAD	2	GREAT PINES ROAD	#110 LOCKS POND RD	5280	89	5	\$0		750	10/17/02
LOCKS POND ROAD	3	#110 LOCKS POND RD	WENDELL ROAD	2640	89	5	\$0		750	10/17/03
PELHAM HILL ROAD	1	LEVERETT ROAD	LEONARD ROAD	5808	99	5	\$0		400	10/21/02
PELHAM HILL ROAD	2	LEONARD ROAD	GRAVEL	4646	94	5	\$0		350	10/21/02
PELHAM HILL ROAD	3	BAKER ROAD	PELHAM TOWN LINE	2482	57	2	\$66,187	3	300	10/17/02
PRESCOTT ROAD	1	COOLEYVILLE ROAD	ROUTE 202	4382	99	5	\$0		1000	10/17/02
SCHOOL DRIVE	1	WEST PELHAM ROAD	DEAD END	317	99	5	\$0		50	10/21/02
STOWELL ROAD	1	WENDELL ROAD	DEAD END	581	74	4	\$2,098	7	5	10/17/02
TOWN COMMON RD.	1	WENDELL ROAD	WENDELL ROAD	581	66	3	\$3,873	6	5	10/17/02
WEATHERWOOD RD.	1	CUSHMAN ROAD	CUL-DE-SAC	1848	65	3	\$40,040	5	50	10/21/02
WENDELL ROAD	1	LEVERETT ROAD	POLE 27 (PAVE CHNGE)	3696	99	5	\$0		1000	10/17/02
WENDELL ROAD	2	POLE 27 (PAVE CHNGE)	LOCKS POND ROAD	7339	90	5	\$0		1000	10/17/02
WENDELL ROAD	4	GRAVEL	WENDELL TOWN LINE	158	100	5	\$0		1000	10/17/02
WEST PELHAM RD.	1	LEVERETT ROAD	LEONARD ROAD	5280	99	5	\$0		1000	10/21/02
WEST PELHAM RD.	2	LEONARD ROAD	POLE 203	1584	100	5	\$0		750	10/21/02
WEST PELHAM RD.	3	POLE 203	BAKER ROAD	3696	95	5	\$0		750	10/21/02
WEST PELHAM RD.	4	BAKER ROAD	PELHAM TOWN LINE	4171	95	5	\$0		750	10/21/02

**Appendix B: Existing Pavement Conditions (Fall 2002)
Ranked List of Town Maintained Paved Roads**

STREET NAME	SECTION ID #	SECTION FROM:	SECTION TO:	LENGTH (ft)	PCI	REPAIR CODE	ESTIMATED COST	PMS RANK	ESTIMATED ADT	SURVEY DATE
LEVERETT ROAD	1	WENDELL ROAD	MONTAGUE ROAD	4752	84	4	\$30,360	1	2000	10/17/02
LEVERETT ROAD	3	PRATT CORNER ROAD	LEVERETT TOWN LINE	3696	78	2	\$98,560	2	2000	10/17/02
BAKER ROAD	3	SCHOOL HOUSE ROAD	GRAVEL	898	55	2	\$14,967	3	200	10/21/02
PELHAM HILL ROAD	3	BAKER ROAD	PELHAM TOWN LINE	2482	57	2	\$66,187	3	300	10/17/02
WEATHERWOOD RD.	1	CUSHMAN ROAD	CUL-DE-SAC	1848	65	3	\$40,040	5	50	10/21/02
TOWN COMMON RD.	1	WENDELL ROAD	WENDELL ROAD	581	66	3	\$3,873	6	5	10/17/02
STOWELL ROAD	1	WENDELL ROAD	DEAD END	581	74	4	\$2,098	7	5	10/17/02
BAKER ROAD	1	PELHAM HILL ROAD	GRAVEL	528	100	5	\$0		200	10/21/02
COOLEYVILLE ROAD	2	PRESCOTT ROAD	WENDELL ROAD	2165	99	5	\$0		1000	10/17/02
FARRAR ROAD	1	LAKEVIEW ROAD	GRAVEL	211	99	5	\$0		100	10/17/02
JANUARY HILLS RD.	1	AMHERST TOWN LINE	LEVERETT TOWN LINE	4066	88	5	\$0		250	10/21/02
LAKEVIEW ROAD	1	WENDELL ROAD	PARK ENTRANCE	2640	100	5	\$0		1000	10/17/02
LAKEVIEW ROAD	2	PARK ENTRANCE	LEVERETT TOWN LINE	2851	98	5	\$0		1000	10/17/02
LEVERETT ROAD	2	MONTAGUE ROAD	PRATT CORNER ROAD	3168	99	5	\$0		2000	10/17/02
LOCKS POND ROAD	1	LAKEVIEW ROAD	GREAT PINES ROAD	2112	95	5	\$0		750	10/17/02
LOCKS POND ROAD	2	GREAT PINES ROAD	#110 LOCKS POND RD	5280	89	5	\$0		750	10/17/02
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PELHAM HILL ROAD	2	LEONARD ROAD	GRAVEL	4646	94	5	\$0		350	10/21/02
PRESCOTT ROAD	1	COOLEYVILLE ROAD	ROUTE 202	4382	99	5	\$0		1000	10/17/02
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WENDELL ROAD	4	GRAVEL	WENDELL TOWN LINE	158	100	5	\$0		1000	10/17/02
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TOWN OF SHUTESBURY

PAVEMENT MANAGEMENT STUDY

SCENARIO 2



**FRANKLIN REGIONAL
COUNCIL OF GOVERNMENTS**

425 Main Street, Greenfield, MA 01301
413-774-3167



June 2004

TOWN OF SHUTESBURY

PAVEMENT MANAGEMENT STUDY

SCENARIO 2

Franklin Regional Council of Governments

Patricia Allen, Chair

Franklin Regional Council of Governments Executive Committee

Bill Perlman, Chair

Franklin Regional Planning Board

Thomas W. Hutcheson, Chair



June 2004

Franklin Regional Council of Governments

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Massachusetts Highway Department and the U.S. Department of Transportation, Federal
Highway Administration**

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Executive Summary

The Franklin Regional Council of Governments (FRCOG) has been involved in pavement management since the early 1990s. In 1997 the FRCOG concluded a three year contract with the Massachusetts Highway Department (MassHighway) that completed the survey and analysis of nearly 500 miles of Federal-Aid and State Transportation Program (STP) funded roads in the 26 Franklin County communities. Since the completion of that contract, the FRCOG has continued its commitment to assist Franklin County communities who are interested in establishing a Pavement Management System for their community. The Town of Shutesbury requested that a portion of their Executive Order 418 funding be utilized to produce a pavement management analysis of the town maintained paved road network. The results of the analysis are contained within this report.

The Town of Shutesbury maintains 31.15 miles of roadway, of which 14.98 miles are currently paved. The FRCOG conducted a pavement surface survey during the fall of 2002 and analyzed the data. The survey indicates that the Town is implementing sound pavement management practices, with the paved road network currently in a Good overall condition.

An analysis of future conditions indicates that existing levels of Chapter 90 funding combined with the reconstruction of Leverett, Cooleyville and Prescott Roads and an additional investment of saved funds will be sufficient to allow the Town to improve the condition of paved road network and keep it in a perpetual Good to Excellent Condition.

Over the next several years the Town should monitor the paved road maintenance needs and explore and utilize alternative funding sources when necessary to ensure that the paved road network continues to be maintained in a perpetual Good to Excellent condition.

The Town now has the base data that will allow it to monitor its progress with maintaining the road network through the regular survey of its paved road network and the FRCOG will continue to provide support to the extent possible.

Introduction

The Franklin Regional Council of Governments (FRCOG) has been involved in pavement management since the early 1990s. In 1997 the FRCOG concluded a three-year contract with the Massachusetts Highway Department (MassHighway) that completed the survey and analysis of nearly 500 miles of Federal-Aid and State Transportation Program (STP) funded roads in the 26 Franklin County communities. Since the completion of that contract, the FRCOG has continued its commitment to assist Franklin County communities who are interested in establishing a Pavement Management System for their community. Since 1997 the FRCOG has completed pavement management studies for the towns of Buckland, Heath, Orange and Shelburne. The Town of Shutesbury requested that a portion of their Executive Order 418 funding be utilized to produce a pavement management analysis of the town maintained paved road network. The FRCOG was contracted to complete the study and the results of the analysis are contained within this report.

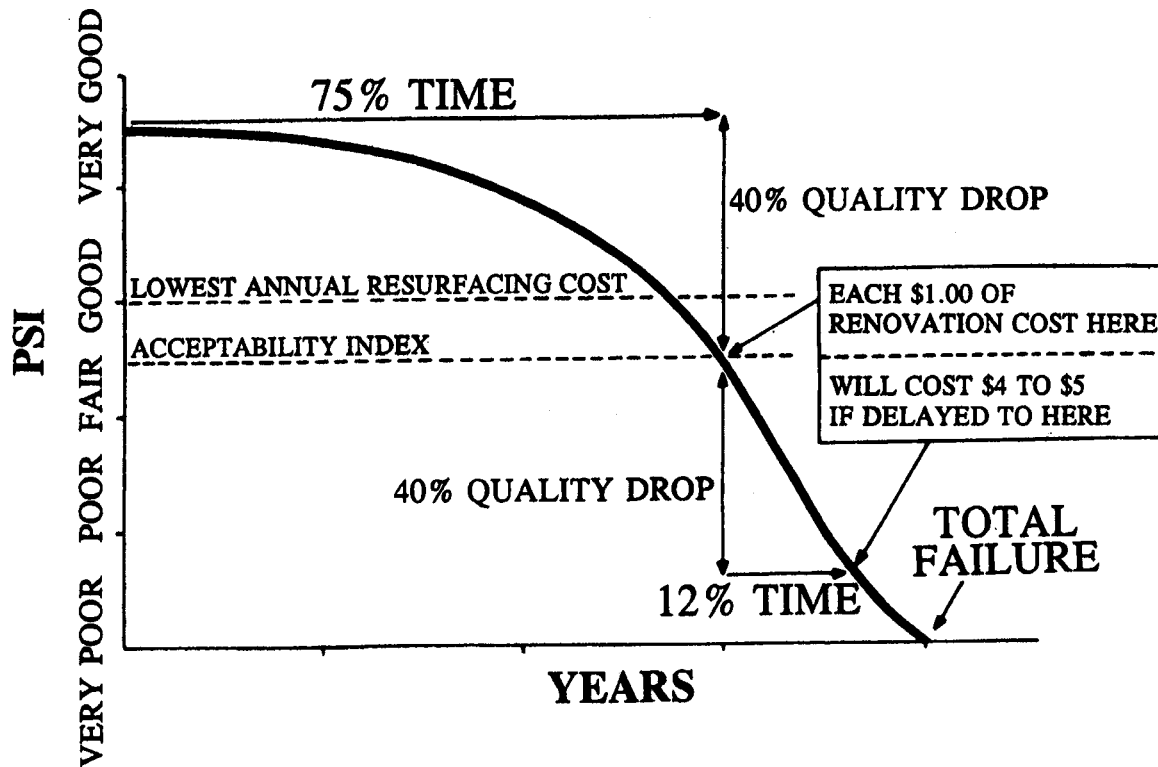
A Pavement Management System (PMS), as defined by the American Public Works Association (APWA), is “a systematic method for routinely collecting, storing, and retrieving the kind of decision-making information needed (about pavement) to make maximum use of limited maintenance and construction dollars.” Historically, road maintenance funds were channeled to those roads that were perceived by local highway superintendents to be in the worst condition, or where political influence dictated. Various studies have indicated that a pavement maintained in a perpetual “Good” to “Excellent” condition, requires one-fourth to one-fifth the investment of a pavement that is un-maintained and rehabilitated once it reaches a “Poor” or “failed” condition. A PMS is designed to provide quantitative information to support repair and budget decisions which reflect this thinking.

Figure 1 gives a graphical depiction of the general life cycle of an asphalt pavement. Under normal conditions of consistent weather and traffic patterns, a pavement will deteriorate by 40 percent in the first 75 percent of its life. During the next 12 percent of its life, the pavement will deteriorate by a further 40 percent. With proper timing of preventative maintenance measures during the first 75 percent of a pavement’s life, many years can be added to the functionality of the road at a lower overall cost.

With limited availability of transportation funding, it is more important than ever to make cost-effective decisions. A formalized PMS improves on the existing practices that most highway departments already employ by enhancing professional judgment through guidelines and a standardized approach. It also provides highway departments and Town officials with information that can be used to levy additional funding either from Town Meeting or State and Federal sources. A PMS is generally based on a computer software database that has been developed from years of research into the function and longevity of pavement materials and the effects of timed repair strategies. A PMS can help in determining the most appropriate time for repair action, the most cost-effective methods, and the cost of maintaining the roadway at the desirable condition level.

This pavement management study provides the core information and a starting point for the formalizing of a pavement management system for the Town.

Figure 1: Life Cycle of Asphalt Pavement



ROADWAY DETERIORATION vs TIME

Source: 1996 Pavement Management Program Technical Report, MassHighway

Background

The FRCOG utilizes the RoadManager (RM) pavement management software for its pavement management studies and extracts basic geometric and administrative information about roads from the MassHighway maintained Road Inventory File (RIF). The RIF is a computerized database containing information on all public roads and highways within the Commonwealth of Massachusetts. It was originally compiled from field data collected between 1969 and 1974 and has become an important reference source for transportation planning and administration at the Federal, State and local levels. In conjunction with this study, the FRCOG has worked with the Highway Superintendent, to update the information contained in the latest version of the RIF. A number of new roadways have been constructed, as well as street names changed, and these have been incorporated into the data used in this study. The FRCOG will be working with the Town and MassHighway to ensure that all updates identified will be reflected in future versions of the RIF.

The road network in the Town of Shutesbury is comprised of both paved and gravel surfaces. According to the 2001 year-end release of the RIF with the subsequent updates, the Town is

responsible for the maintenance of 31.15 miles of roadway and MassHighway is responsible for the maintenance of 3.16 miles of roadway. Unaccepted (abandoned or privately maintained) roadways account for an additional 6.24 miles, and the Metropolitan District Commission (MDC) is responsible for the maintenance of another 4.87 miles of roads within the town. This produces a total of 45.42 miles of both paved and gravel roadways in the Town of Shutesbury. It should be noted that these mileages are provisional until MassHighway has accepted the submitted updates. Map 1 shows the Shutesbury road network by Maintenance Authority (i.e. Town, MassHighway, etc.)

Functional Classification of roadways was mandated under the Federal Intermodal Surface Transportation Efficiency Act (ISTEA) legislation passed in 1991, and was completed in 1993 by MassHighway in cooperation with the 13 Regional Planning Agencies. The Federal Highway Administration states that, “Functional classification is the process by which streets and highways are grouped into classes, or systems, according to the character of service they are intended to provide. Functional classification defines the nature of this channeling process by defining the part that any particular road or street should play in serving the flow of trips through a highway network.”¹ The classification ranks roads according to a hierarchy and determines which roads are eligible for Federal Aid and State Transportation Program (STP) funds for improvements through the Transportation Improvement Program (TIP) coordinated by the Franklin Regional Council of Governments.

There are four basic categories of functional classification based on the hierarchical system. They are:

- Interstates - Highways that serve interstate travel;
- Arterials - Roads that link cities to towns or provide interstate/intercounty service;
- Collectors - Roads that serve towns outside of the arterial system, lead to the arterial system, or link towns; and
- Local - Roads that primarily serve residential areas or adjacent land uses.

Arterials and Collectors have further sub-classifications of “Urban” or “Rural”, and “Major” or “Minor” based on population density characteristics. All roadways in Shutesbury are termed “Rural”.

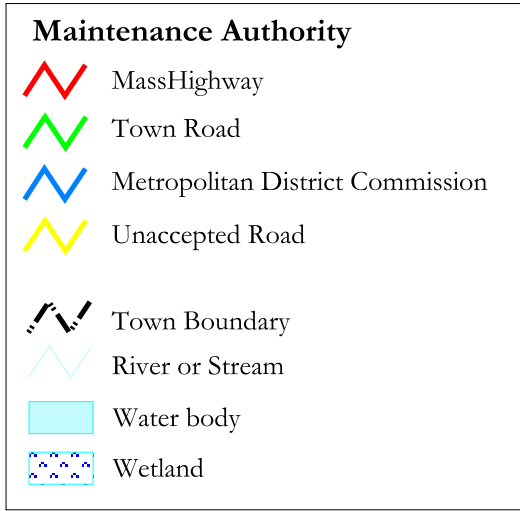
Shutesbury’s road network is made up of Arterial, Collector and Local classified roadways. Map 2 shows the road network and the assigned functional classifications. The 3.16 miles of Route 202 maintained by MassHighway is functionally classified as Rural Minor Arterial. Of the 31.15 miles of roadway maintained by the Town, 8.50 miles are classified as Rural Major Collector, 2.79 miles as Rural Minor Collector and the remaining 19.86 miles as Rural Local. Town maintained roadways classified as Rural Major Collector are eligible for Federal Aid and STP funds for reconstruction through the TIP Process. The procedures for applying for this source of funding are discussed later in this report.

¹ Highway Functional Classification: Concepts, Criteria and Procedures. U.S. Department of Transportation, Federal Highway Administration. March 1989. Publication number FHWA-ED-90-006

TOWN OF SHUTESBURY PAVEMENT MANAGEMENT STUDY

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Map 1 - Maintenance Authority

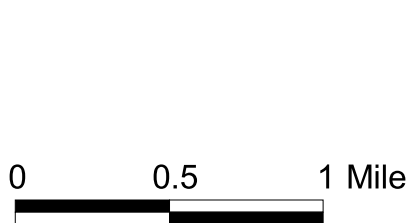
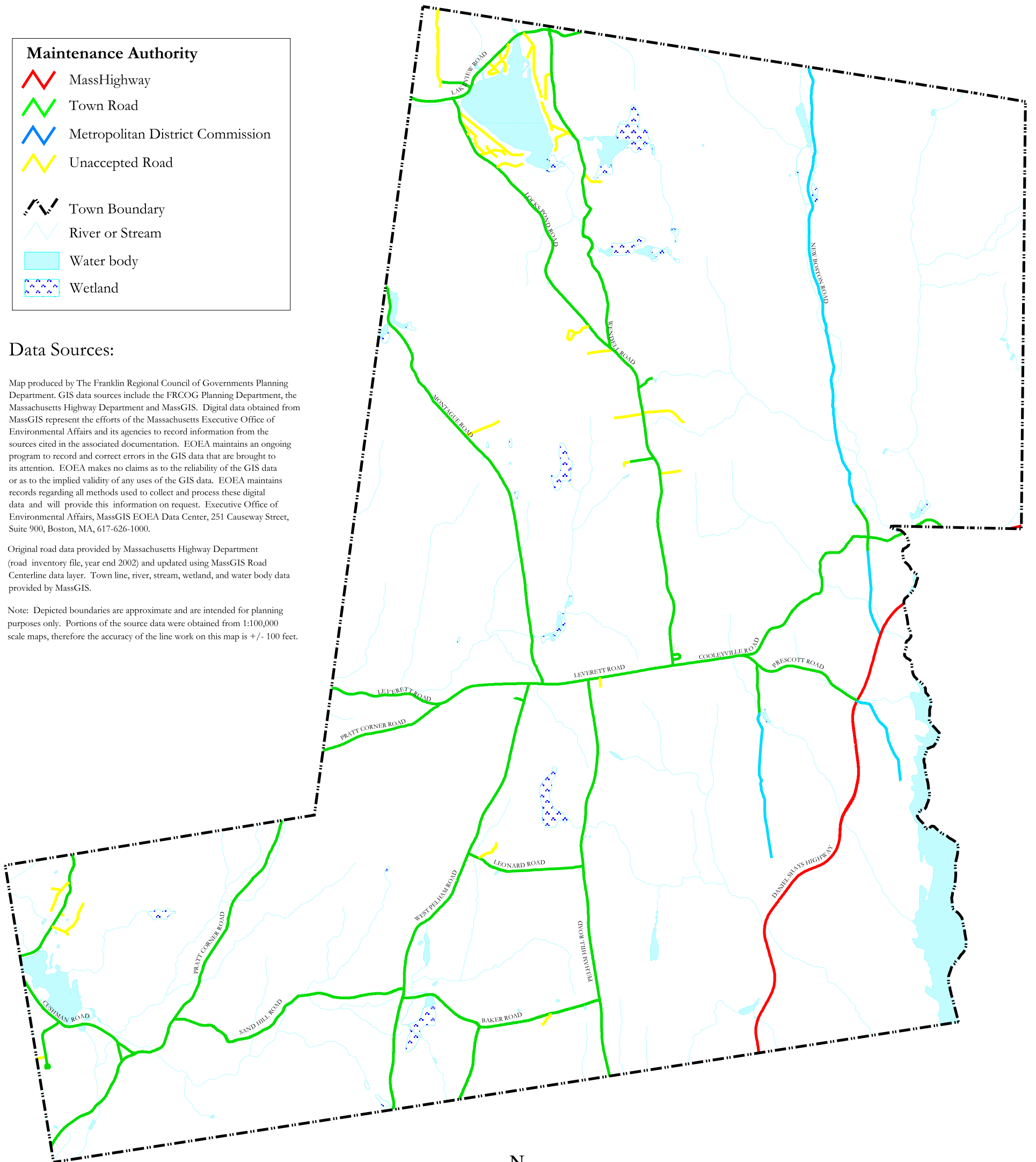


Data Sources:

Map produced by The Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, the Massachusetts Highway Department and MassGIS. Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. EOEa maintains an ongoing program to record and correct errors in the GIS data that are brought to its attention. EOEa makes no claims as to the reliability of the GIS data or as to the implied validity of any uses of the GIS data. EOEa maintains records regarding all methods used to collect and process these digital data and will provide this information on request. Executive Office of Environmental Affairs, MassGIS EOEa Data Center, 251 Causeway Street, Suite 900, Boston, MA, 617-626-1000.

Original road data provided by Massachusetts Highway Department (road inventory file, year end 2002) and updated using MassGIS Road Centerline data layer. Town line, river, stream, wetland, and water body data provided by MassGIS.

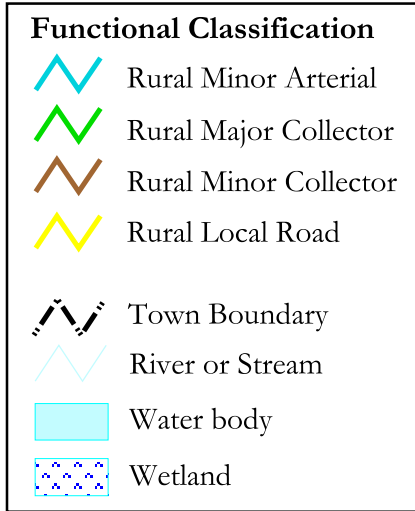
Note: Depicted boundaries are approximate and are intended for planning purposes only. Portions of the source data were obtained from 1:100,000 scale maps, therefore the accuracy of the line work on this map is +/- 100 feet.



TOWN OF SHUTESBURY PAVEMENT MANAGEMENT STUDY

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Map 2 - Functional Classification

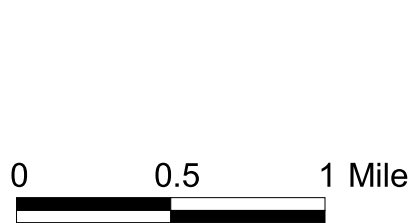
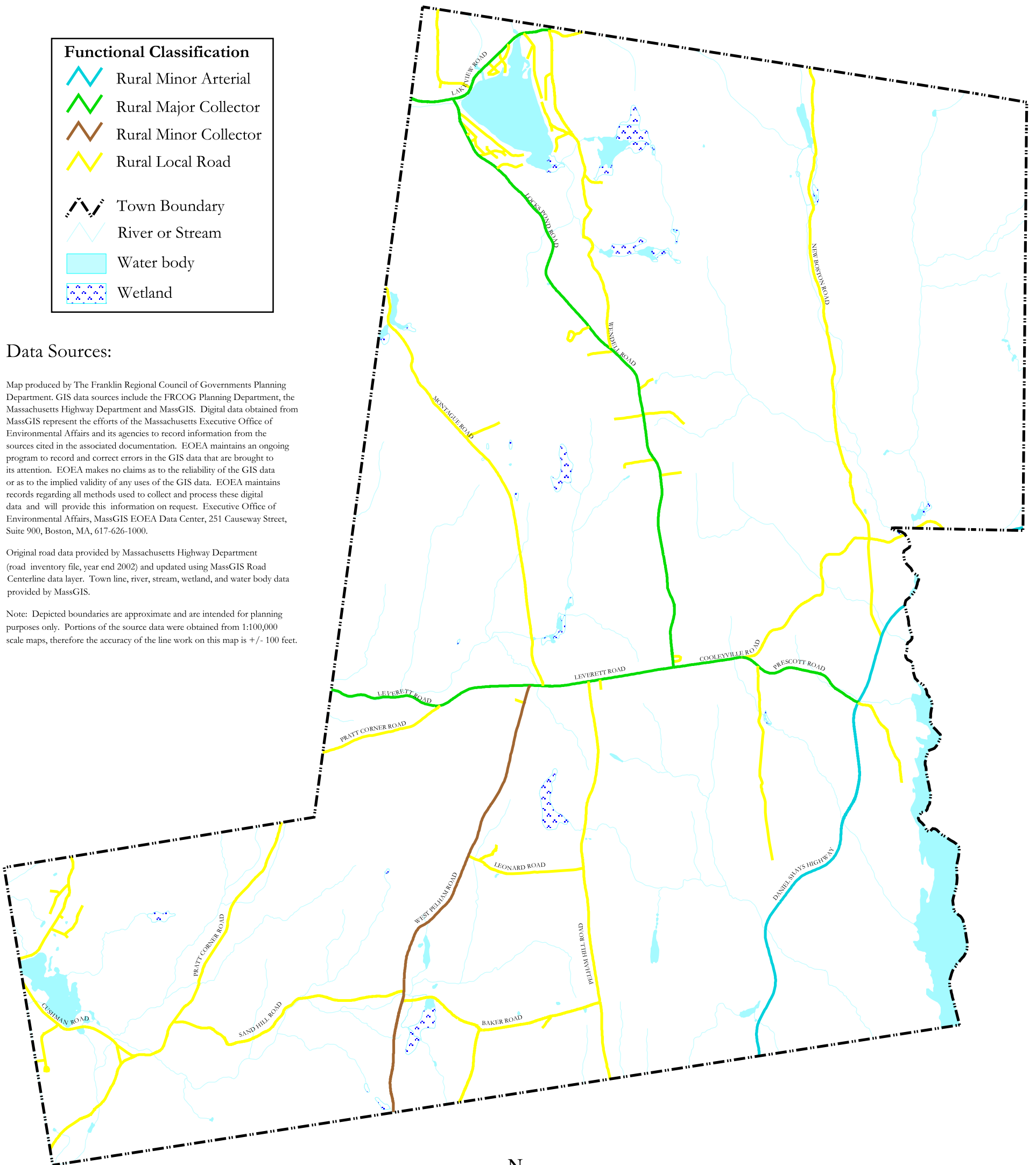


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As mentioned previously, there are 31.15 miles of Town maintained paved and gravel roads within the Town of Shutesbury. Because gravel roads generally receive regular maintenance this report deals only with the paved road network. The pavement survey identified 14.98 miles of town maintained paved roadway and 16.17 miles of town maintained gravel roads. The Highway Superintendent (Tim Hunting) identified 0.47 miles of Pelham Hill Road from Baker Road to the Pelham town line that is currently gravel and may be paved in the future. For the purposes of this study this section of roadway has been treated as if this section of roadway will remain gravel. Map 3 distinguishes the paved road network from the gravel surfaced roadways. The 3.16 miles of MassHighway maintained roadways are all paved and were surveyed as part of this study.

Methodology

The methodology used for data collection and analysis was designed to maximize the effectiveness of the RM software. For each paved road, section breaks were defined based on the following criteria: at a change in pavement surface type; at a pavement width change of more than five feet; or if the pavement conditions changed dramatically. All data collection was conducted by a field survey. This involved driving each road twice. The first pass identified the start and end points of each section, additionally the section length and width were recorded along with the pavement type. The second pass was made at low speed (5 mph) during which the average pavement distresses were noted.

The RM software requires the identification of nine categories of distresses, which are:

1. Potholes and Non-Utility Patches
2. Travel Lane Alligatoring
3. Distortion
4. Rutting
5. Weathering/Block Cracking
6. Transverse and Longitudinal Cracking
7. Bleeding/Polished Aggregate
8. Surface Wear and Raveling
9. Corrugation, Shoving or Slippage

Distress categories 1 to 4 are known as base distresses. These distresses show up in the pavement surface because of a failure in the road base and can only be permanently repaired by reconstruction to the full depth of the road structure. Distress categories 5 to 9 are known as surface distresses. These distresses are generally caused by a failure in the pavement surface due to the result of aging and/or vehicle loading and can be repaired with relatively low cost maintenance methods such as crack sealing or overlaying with a few inches of asphalt.

The average severity and extent of each distress was noted for each section and then input into the software. On completion of the data entry for each section, the software conducted three sets of analyses:

1. Calculation of a Pavement Condition Index (PCI)
2. Assignment of a Repair Strategy
3. Calculation of a Benefit Value

The Pavement Condition Index (PCI) is based upon a scale between 100 (best) and 0 (worst). A section with no distresses will have a PCI equal to 100 and as the number, severity and extent of distresses increase the lower the PCI becomes. A general evaluation of a pavement's condition is as follows:

- **PCI between 95 and 100** means that the pavement is in **Excellent** condition and generally requires no immediate pavement maintenance.
- **PCI between 85 and 94** means that the pavement is in **Good** condition and generally requires minor or no immediate pavement surface maintenance.
- **PCI between 65 and 84** means the pavement is in **Fair** condition and will generally need minor to extensive pavement surface maintenance and/or rehabilitation.
- **PCI between 0 and 64** means the pavement is in **Poor** condition and will generally need extensive rehabilitation or reconstruction.

Repair strategies are assigned to sections through a matrix, which takes into account the PCI, condition of the pavement base associated with the observed surface distresses, the average curb height, functional class and the pavement type. Five generalized repair categories are used. The costs associated with each of these categories were discussed with the Highway Superintendent and provide a fair estimate of the total costs involved in designing, bidding, conducting and overseeing each of the repairs.

The five repair strategies are as follows:

1. **Reconstruction Or Reclamation** (\$30 per sq/yd)
Complete removal and replacement of a failed pavement and base by excavation or reclamation, which may include widening and realignment, installation of drainage and culverts, and safety hardware such as guardrails and signage.
2. **Rehabilitation** (\$10 per sq/yd)
Full depth patching, partial depth patching, joint and crack sealing, grouting and under-sealing, grinding or milling in conjunction with overlays over 2 inches in depth. Edge work and drainage would likely also be required in conjunction with an overlay.
3. **Preventative Maintenance** (\$7.50 per sq/yd)
Localized crack sealing and full/partial depth patching in conjunction with Chip sealing, or Micro Surfacing, or overlays less than 2 inches in depth. Edge work would likely also be required in conjunction with an overlay.
4. **Routine Maintenance** (\$2.50 per sq/yd)
Crack sealing and localized patching.
5. **No Immediate Action** (\$0 per sq/yd)
No maintenance

The existing pavement area (section length multiplied by section width) is multiplied by the assigned repair strategy cost to provide an estimated total cost of conducting the repair on the road section.

The “Benefit Value” (BV) reflects the Cost/Benefit of doing the repair and is used in the budgetary analysis to prioritize sections for repair. There is no scale for the BV, only that those sections with the highest values are more beneficial and cost effective. The following formula is used to calculate the BV.

$$\text{BV} = \frac{365 \times \text{ADT} \times \text{Section Length} \times \text{Estimated Life of Repair}}{\text{Current Cost of Repair} \times \text{Pavement Condition Index}}$$

It can be seen from this formula that roads with higher Average Daily Traffic (ADT) volumes will be assigned higher BV’s, which provides priority for higher volume roads. On roadways where no traffic volume data was available, volumes were estimated based on road use and the number of homes and businesses located along them and with consultation with the Highway Superintendent. Appendix A contains a table of the ADT volumes collected in Shutesbury from 1991 through 2002 by the FRCOG and MassHighway and a corresponding map showing the locations with existing traffic volume data.

Additionally, Routine and Preventative Maintenance repairs receive higher weighting than Rehabilitation and Reconstruction repairs to reflect the principles of pavement management.

Existing Conditions Analysis Results

The following section summarizes the results of the analysis of the existing conditions surveyed in the Fall of 2002. It should be noted that the information contained in the tables and figures was created from a visual evaluation of the pavement surface in which the severity and extent of the observed distresses were estimated. The recommended repair strategies and the associated costs are not final. A more detailed engineering evaluation must be conducted before finalizing any repairs and their associated costs. The information presented here can be used as a tool for preliminary evaluation and prioritization of the paved road network as a whole.

Existing Pavement Conditions

Data collection was conducted in October, 2002. Appendix B contains detailed information on the existing conditions of the paved road network. Table 1 and Figure 2 summarize the results of the pavement management analysis of existing conditions for town maintained paved roadways and table 2 and figure 3 for the surveyed MassHighway maintained paved roadways, while Map 4 shows the existing conditions broken down into the four condition categories: Excellent, Good, Fair, and Poor for all the surveyed paved roadways.

Overall the conditions of the town maintained paved road network in Shutesbury could be considered as Good, with an average PCI equal to 93. Over half of the paved road network was assessed in Excellent condition and over a quarter in Good condition. The 1% of the paved road network assessed in Poor condition is the almost two tenths of mile of Baker Road between School House Road and the start of the gravel surface. The high percentage of roadways in Excellent and Good condition indicates that Shutesbury has done a very good job of maintaining its paved road network with the limited funds that have been available.

Table 1: Summary of Existing Pavement Conditions for Town Maintained Paved Roads

PAVEMENT CONDITION (PCI Range)	Number of Miles	% of Total Mileage
Excellent (≥ 95)	8.10	54%
Good ($85 \leq \leq 94$)	4.54	30%
Fair ($65 \leq \leq 84$)	2.17	15%
Poor (< 65)	0.17	1%
Total Mileage	14.98	

Overall, the conditions of the MassHighway maintained paved road network in Shutesbury could be considered as Good, with an average PCI equal to 91. Much of Route 202 through Shutesbury was recently crack sealed, bringing the pavement condition back to a Good condition.

Table 2: Summary of Existing Pavement Conditions for Surveyed MassHighway Maintained Paved Roads

PAVEMENT CONDITION (PCI Range)	Number of Miles	% of Total Mileage
Excellent (≥ 95)	1.00	32%
Good ($85 \leq \leq 94$)	2.08	66%
Fair ($65 \leq \leq 84$)	0.08	2%
Poor (< 65)	0.00	0%
Total Mileage	3.16	

Assignment of Repair Strategies

Now that the existing conditions have been documented and road segments have been grouped into the four condition categories, a breakdown of recommended repairs and estimated costs of repairs has been calculated. This information is summarized in Table 3 for town maintained paved roads. This table includes the results of a calculation called “Backlog of Repair”. The Backlog of Repair reflects the estimated cost of conducting all the prescribed repairs to bring the paved network up to an Excellent condition. This Backlog of Repair is estimated to equal \$189,898 for town maintained paved roadways. It should be noted that this backlog does not reflect the proposed \$1.5 million reconstruction of Leverett, Cooleyville and Prescott Roads. It does reflect any repairs that are currently prescribed by the analysis for these road sections based on the surface survey. The majority (60%) of the Town’s Backlog of Repair is accounted for by two road segments totaling 0.87 miles deemed by the analysis software to require a rehabilitation repair. These two segments are the segments of Baker Road in Poor condition and the segment of Leverett Road between Pratt Corner Road and the Leverett Town Line listed in Fair condition.

The distribution of the mileage indicates that the Town has been following good pavement management practices in that over 90% of the mileage requires either no immediate action or routine maintenance.

Table 3: Summary of Suggested Repairs for Town Maintained Paved Roads

REPAIR TYPE	Number of Miles	% of Total Mileage	Estimated Cost of Repair
5. No Immediate Action	12.64	84%	\$0
4. Routine Maintenance	1.01	7%	\$32,458
3. Preventative Maintenance	0.46	3%	\$43,913
2. Rehabilitation	0.87	6%	\$113,527
1. Reconstruction	0.00	0%	\$0
Total Mileage	14.98		Backlog of Repair = \$189,898

Table 4 summarizes the suggested maintenance needs of the surveyed MassHighway maintained roadways. It appears that Route 202 through Shutesbury is undergoing maintenance, as some of the roadway has recently been crack sealed. It is likely that crack sealing will be completed on the remaining sections of roadway this coming year. The Backlog of Repair for the MassHighway maintained roadways in Shutesbury has been assessed at \$88,457.

Table 4: Summary of Suggested Repairs for MassHighway Maintained Paved Roads

REPAIR TYPE	Number of Miles	% of Total Mileage	Estimated Cost of Repair
5. No Immediate Action	1.00	32%	\$0
4. Routine Maintenance	2.08	66%	\$79,314
3. Preventative Maintenance	0.08	2%	\$9,143
2. Rehabilitation	0.00	0%	\$0
1. Reconstruction	0.00	0%	\$0
Total Mileage	3.16		Backlog of Repair = \$88,457

Calculation of a Benefit Value

Of the 28 town maintained road sections surveyed, only 7 (2.81 miles) require some form of repair. The remaining 21 (12.64 miles) sections require no immediate maintenance. As mentioned previously, a Benefit Value (BV) reflects the Cost/Benefit of doing a suggested repair, and is used to help prioritize sections for repair. There is no scale for the BV, but sections with the highest values are generally more beneficial and cost effective. BV can then be translated into a ranking system to indicate repair priorities. It should be noted that this ranking system does not take into account social factors such as the need to maintain suitable emergency vehicle access.

Therefore, the roadway section with the highest BV has received a rank of 1 and the lowest has received a rank of 6. Appendix B contains this information for all surveyed road sections. Table 5 on the next page shows the seven sections requiring repair in prioritized order according to the calculated Benefit Value.

Because of the limited number of road segments requiring repair and wide variations in traffic volumes it is difficult to see the standard pattern that generally occurs with the ranking. Generally, to reflect the principles of pavement management, roadways requiring routine and preventative maintenance would dominate the top ten list. In Shutesbury’s case the number one ranked project is a routine maintenance repair on Leverett Road, but because of the influence of traffic volumes in the benefit value calculation the next two ranked segments are rehabilitation repairs.

Table 5: Top 6 Town Maintained Road Sections for Repair

Street Name	Section ID#	Section From:	Section To:	Length (ft)	PCI	Repair Code	Estimated Cost	Rank	Estimated ADT	Survey Date
Leverett Road*	1	Wendell Road	Montague Road	4752	84	4	\$30,360	1	2000	10/17/02
Leverett Road*	3	Pratt Corner Road	Leverett Town Line	3696	78	2	\$98,560	2	2000	10/17/02
Baker Road	3	Schoolhouse Road	Gravel	898	55	2	\$14,967	3	200	10/21/02
Weather-wood Road	1	Cushman Road	Cul-de-sac	1848	65	3	\$40,040	4	50	10/21/02
Town Common	1	Wendell Road	Wendell Road	581	66	3	\$3,873	5	5	10/17/02
Stowell Road	1	Wendell Road	Dead End	581	74	4	\$2,098	6	5	10/17/02

Street Name - Street Name. * Indicates the road section is eligible to receive Federal Aid or Non-Federal Aid for Reconstruction only.

Section From - Start point of the individual section.

Section To - End point of the individual section.

Length (ft) - The length of the section, measured in feet.

PCI - Pavement Condition Index: 95 - 100 indicates the pavement is in **Excellent** condition,
 85 - 94 indicates the pavement is in **Good** condition;
 65 - 84 indicates the pavement is in **Fair** condition;
 0 - 64 indicates the pavement is in **Poor** condition.

** - Currently gravel surface identified for paving in the near future

Repair Code - 1. Reconstruction; (\$30 sq/yd)
 2. Rehabilitation; (\$10 sq/yd)
 3. Preventative Maintenance; (\$7.50 sq/yd)
 4. Routine Maintenance; (\$2.50 sq/yd)
 5. No Immediate Maintenance. (\$0 sq/yd)

Rank - A ranking of all the sections requiring repair, based on a cost/benefit produced by the RoadManager software through the Benefit Value. The section with the highest Benefit Value has received a PMS Ranking of 1. Sections with equal Benefit Values have received the same ranking. In total there are 28 ranked sections.

Estimated ADT - Average Daily Traffic traveling on each section of road. Generally, traffic count data was available on the higher volume roads. Where data was not available, estimates were made based on the functionality of the road and the number of houses or businesses they served.

Survey Date - Date on which the pavement distress data was collected.

Budgetary Analysis

Existing Funding Levels

The primary source of funding for road repairs and reconstruction in the Town of Shutesbury is its Chapter 90 allocation from the State. Each municipality in the Commonwealth receives Chapter 90 funding through the Transportation Bond. Funding levels are based on a formula that takes into account the number of miles of town maintained roadways, population, and level of employment. Approved Chapter 90 projects are 100% reimbursable. However, a town must receive written approval from their MassHighway District Director before beginning a project. Eligible Chapter 90 projects are highway construction or improvement projects that extend the life of a roadway or bridge. Other eligible Chapter 90 uses are engineering services for projects on the TIP or other transportation projects, pavement management services, and the purchase of road machinery, equipment, or tools.

The Town of Shutesbury's allocation of Chapter 90 funding for FY 2003 totaled approximately \$71,000. Even though Massachusetts is currently facing a budget crisis where many programs are facing cuts in funding, when this analysis was conducted in April 2003 there was no indication the current \$100 million statewide Chapter 90 program would be reduced. According to the Highway Superintendent, the Town of Shutesbury generally uses its full Chapter 90 allocation for maintenance of its paved road network.

Roadways that are functionally classified as a Major Collector or higher are eligible to receive Federal Aid and Non-Federal Aid for reconstruction projects through the Transportation Improvement Program (TIP). An explanation of the TIP process appears later in this report. Town maintained roadways eligible for this funding source are: Lakeview Road, Locks Pond Road, Wendell Road, Leverett Road, Cooleyville Road and Prescott Road. The Town has been pursuing TIP funding for the reconstruction of Leverett, Cooleyville and Prescott Roads, but issues over the design required by MassHighway had stalled this project. Recently, this project was identified by the Franklin Regional Council of Governments in cooperation with the Town, as its initial project for MassHighway's Footprint Road Program. The Footprint Road Program, still under development, is intended to allow road projects that make improvements within the existing paved footprint of the road to be funded through the TIP process if certain criteria are met. At this time, the Town has appropriated the funds to complete the design for this project, and submitted the Footprint Road Application for review by MassHighway. This project has been scheduled in the TIP for advertisement in FY 2004 and would likely be constructed in 2005. A pavement overlay was applied to this roadway a couple of years ago to provide a suitable riding surface and prevent further deterioration of the road structure in the meantime. It appears from the pavement surface survey that apart from one segment of Leverett Road that this repair is holding together well.

The Town has also appropriated its own funds towards repairs and upkeep of both the gravel and paved road network in the past, but with the tightening financial situation, this may not continue into the future.

The RM software can be used to predict the potential effect funding levels will have on the future conditions of the paved road network. The RM software creates a prioritized list of sections requiring repair by ranking them based on the BV. When assigning funds to repair sections of roadway, the software starts at the top of the ranked list and works its way down. As the budget limit nears and the next ranked section has too high a cost to remain within the budget, the software continues to scan down the list, choosing sections for repair until the budget limit is reached or there are no more ranked sections. Those sections chosen for repair then assume a PCI of 99 (Excellent condition). For planning and forecasting purposes, those sections not selected are then evaluated by the software based on performance curves developed from research into the life cycles of pavements under differing traffic loading characteristics. The performance curves resemble the generic curve shown in figure 1 at the beginning of the report. Each year that a section is not chosen for repair, its PCI value drops down the curve. At the end of each year, the repair strategies are reassigned based on the decreased PCI and the costs and BVs are recalculated producing a new list of ranked sections for the next year's budget allocation.

To predict the potential impacts the existing funding projections will have on the condition of the town maintained paved road network over a ten-year period between 2003 and 2012, a budgetary analysis was run using the following assumptions developed in cooperation with the Highway Superintendent and the Towns Executive Order-418 Committee:

- In 2003 the Highway Superintendent was scheduled to complete the following repairs using a mixture of Chapter 90 and Town appropriated funds:
 - Baker Road, from Schoolhouse Road to gravel – Full depth reclamation and chip seal, \$15,000
 - Weatherwood Road, from Cushman Road to cul-de-sac – Full depth reclamation and chip seal, \$50,000
 - January Hills Road from Amherst Town Line to Leverett Town Line– Double chip seal, \$30,000
 - Town Common Drive – Regrade base and chip seal, \$3,500
- In 2004 the Highway Superintendent had proposed to combine the 2004 Chapter 90 allocation with Chapter 90 funds carried over from previous years to pave the current gravel section of Pelham Hill Road. Due to opposition to this plan, this analysis assigns the expected \$100,000 that was to be used for that project to be used for repairs to the existing paved road network.
- The reconstruction of Leverett Road, Cooleyville Road and Prescott Road under the Footprint Road Program will be completed in 2005 at a cost of \$1.5 million.
- Chapter 90 funds for 2003 through 2005 would be allocated to the projects listed above. From 2006 to 2012 the existing annual allocation of \$71,000 of Chapter 90 funding would be available for paved road maintenance.

For each future year of the analysis, output from the software provides a list of the projects allocated funding and also allows for the calculation of a number of benchmark measures such as Backlog of Repair, miles per repair category, and average PCI for the whole road network.

Table 6 provides a general projection of the future condition of the paved road network that could be expected under the above funding assumptions. It can be seen from this table that the average condition of the road network would likely increase with the improvements conducted by the Town in 2003 and with the reconstruction of Leverett, Cooleyville and Prescott Roads. The average PCI declines in 2010, 2011 and 2012 as those roadways improved in 2003, 2004 and 2005 all begin to decline to where Routine Maintenance activities will begin to be required. The considerable jump in Backlog of Repair in 2012 reflects the fact that sections of Leverett, Cooleyville and Prescott Roads reconstructed in 2005, would likely need Routine Maintenance in 2012. Overall it appears from this analysis that there is sufficient funds to keep pace with all the maintenance needs. It should be noted that this analysis does not account for inflation.

Table 6: Projected Backlog of Repair and Average PCI to 2012 with Existing Funding Levels

Future Year	Funding Level	Backlog of Repair	Average PCI
2002	Existing Conditions	\$256,085	91
2003	\$98,500 ¹	\$228,507	93
2004	\$100,000 ²	\$220,000	93
2005	\$1,500,000 ³	\$ 12,907	95
2006	\$71,000	\$ 33,554	94
2007	\$71,000	\$ 89,538	94
2008	\$71,000	\$116,568	94
2009	\$71,000	\$ 0	94
2010	\$71,000	\$ 12,907	92
2011	\$71,000	\$ 85,682	90
2012	\$71,000	\$205,835	91

¹ – Assumes repairs to Baker Road (\$15,000), Weatherwood Road (\$50,000), January Hills Road (\$30,000) and Town Common Road (\$3,500)

² – Combination of left over Chapter 90 funds from previous years, plus the 2004 Chapter 90 allocation.

³ – Assumes reconstruction of Leverett, Cooleyville and Prescott Roads (\$1.5 million)

Total Funding allocated over ten years equals \$2,195,500

Table 7: Comparison of Existing and Projected Pavement Conditions for Town Maintained Paved Roads in 2012 with Existing Funding Levels

PAVEMENT CONDITION (PCI Range)	Existing 2002 Mileage	Projected 2012 Mileage	Change in Mileage
Excellent (=>95)	8.10	2.90	-5.20
Good (85<=>94)	4.54	10.47	+5.93
Fair (65<=>84)	2.17	1.61	-0.56
Poor (<65)	0.17	0.00	-0.17
Total Mileage	14.98	14.98	

Table 7 provides a comparison between the existing conditions and the projected conditions of the paved road network in 2012 under the existing funding assumptions. This comparison shows that the mileage of roadways in Excellent condition in 2012 would be 5 miles less than in 2002,

while the mileage of roadway in Good condition would increase by almost 6 miles. Mileage in Fair condition would decline by half a mile and there would be no roadways in Poor condition.

Tables 8 and 9 show the projected change in assigned repair strategies and estimated Backlog of Repair for the road sections analyzed to 2012 under existing funding levels. It can be seen that the paved road mileage would require either No Immediate Action or Routine Maintenance. The reduction in mileage in No Immediate Action and increase in mileage requiring Routine Maintenance in 2012 over 2002 is the result of the roadways improved in 2003 through 2005 declining to the point where they would likely begin to require Routine Maintenance.

Table 8: Comparison of Existing and Projected Required Repairs for Town Maintained Paved Roads in 2012 with Existing Funding Levels

REPAIR TYPE	Existing 2002 Mileage	Projected 2012 Mileage	Change in Mileage
5. No Immediate Action	12.64	8.69	-3.95
4. Routine Maintenance	1.01	6.29	+5.28
3. Preventative Maintenance	0.46	0.00	-0.46
2. Rehabilitation	0.87	0.00	-0.87
1. Reconstruction	0.00	0.00	0.00
Total Mileage	14.98	14.98	

Table 9: Comparison of Existing and Projected Backlog of Repairs for Town Maintained Paved Roads in 2012 with Existing Funding Levels

REPAIR TYPE	Existing 2002 Backlog	Projected 2012 Backlog	Change in Backlog
5. No Immediate Action	\$0	\$0	\$0
4. Routine Maintenance	\$32,458	\$205,835	+\$173,377
3. Preventative Maintenance	\$43,913	\$0	-\$43,913
2. Rehabilitation	\$113,527	\$0	-\$113,527
1. Reconstruction	\$0	\$0	\$0
Total Backlog of Repair	\$189,898	\$205,835	+\$15,937

This analysis shows that under this funding scenario that the town would be able to keep pace with all the maintenance needs of the Towns paved road network keeping it in perpetual Good to Excellent condition through 2012. This is the result of the existing Good condition of the paved road network combined with the increased funding available in 2003 and 2004, and the considerable non-town investment used to reconstruct Leverett, Cooleyville and Prescott Roads. The small decline in average PCI from 2011 through 2012 and the increase in Backlog of Repair in 2012 is the result of the roadways that were repaired in 2003, 2004 and 2005, reaching a point in their life where Routine Maintenance activities would begin to be needed. This decline would likely be cleared in the subsequent two or three years.

Increased Chapter 90 Funding

In the late 1990s, the statewide Chapter 90 program was funded at a \$150 million level, which equated to approximately \$106,500 in Chapter 90 funding to the Town of Shutesbury. Since this program was reduced to the \$100 million level there have been many efforts to restore the program to its original \$150 million level. Unfortunately, these efforts have thus far failed and seem less likely than ever to be successful given the current economic climate in Massachusetts. Since the analysis using existing funding levels shows that there was sufficient funds to keep pace with the repair needs of the paved road network, running an analysis with increased Chapter 90 funding levels would produce the same result. Therefore, a budgetary analysis using this funding scenario was not conducted.

Conclusion

Based on the pavement surface survey conducted in the fall of 2002 the paved road network maintained by the Town of Shutesbury is currently in “Good” condition with an average pavement condition index (PCI) of 93. The distribution of the mileage by repair type indicates that the Town’s highway department has been practicing good pavement management practices with the funding that has been available. The analysis indicates that the existing levels of funding provided through Chapter 90, the primary source of road maintenance funds combined with the reconstruction of Leverett, Cooleyville and Prescott Roads using Federal Funds would be sufficient to keep pace with the maintain needs of the paved road network.

The Town now has the base data that will allow it to monitor its progress with maintaining the paved road network through the regular survey (ideally biannually) of its paved road network and the FRCOG will continue to provide support to the extent possible.

Alternative Funding Sources

Transportation Improvement Program

The Town of Shutesbury already does an excellent job at utilizing alternative funding sources. Approximately nine miles of the paved road network is functionally classified as Rural Minor Arterial and Rural Major Collector making these road sections eligible for Federal Aid funds for reconstruction under the Transportation Improvement Program (TIP). The TIP is a prioritized, fiscally constrained listing of all transportation projects in the region eligible to receive federal funding. The TIP is created every year and lists projects for the six upcoming federal fiscal years. The federal fiscal year runs from October 1 to September 30. The FRCOG is responsible for the creation and maintenance of the TIP. The creation and maintenance of the TIP is mandated by the Federal Highway Administration (FHWA). In addition, the FHWA requires that the federal aid portion of the TIP be fiscally constrained and only list projects within the funding levels expected for the subject TIP year.

To the extent possible, non-federal aid (excluding Chapter 90) projects are also included in the TIP, allowing a more complete picture of transportation needs in the region to be reflected. Regional Planning Agencies are working closely with their MassHighway Districts to prioritize and fiscally constrain non-federal aid projects and provide a realistic picture of non-federal aid funding availability.

The Franklin Regional Council of Governments solicits TIP projects each year from Franklin County Towns. At the same time, the FRCOG asks the Towns to provide a status report of projects already on the TIP. Additionally, the FRCOG contacts both MassHighway Districts for a listing of new projects and for the status of existing projects. With this information, projects are placed in the appropriate fiscal year of the TIP. The Franklin Regional Planning Board Transportation Subcommittee is responsible for prioritizing all of the projects in each fiscal year. The ranking procedure is based on the regional and local priority of each project and the status of the project's design and permitting. The Franklin Regional Planning Board (FRPB) then considers the recommendations of the FRPB Transportation Subcommittee before voting to approve the TIP for that period. The TIP is then reviewed at MassHighway Planning in Boston before being officially endorsed by the FRCOG Executive Committee, the Franklin Regional Transit Authority (FRTA), the Greenfield-Montague Transportation Area (GMTA), the Commissioner of MassHighway and the Secretary of the Executive Office of Transportation and Construction.

Bridge projects listed on the TIP are designed, engineered and constructed by MassHighway. Towns usually do not get involved in bridge projects, unless the project design is unacceptable to the Town. For bridges, the Town's responsibilities are to: (1) attend all design public hearings; and (2) acquire any necessary rights-of-way. For road projects initiated by the Town, the Town is responsible for the design and engineering of the project. Design and engineering is a Chapter 90 reimbursable cost once the Town has received approval for the project from the MassHighway District and the MassHighway Project Review Committee.

Towns sometimes view the TIP route of funding unfavorably, due to the small regional funding targets in recent years, and the length of time it can take to work through the process.

An additional concern of using this funding source is often these projects must meet MassHighway Design Standards, which in the past has meant designs with wider roadways requiring land takings, tree removal and a resulting impact to an area's rural appearance. In 1997 MassHighway produced the Low Speed/Low Volume Design Standards, which allow for narrower travel lane widths and shoulders for roadways with speeds less than 40mph and traffic volumes of less than 2000 vehicles per day. It had been hoped that these standards could be applied to the Leverett, Cooleyville, Prescott Roads reconstruction but the projected future traffic volumes on Leverett Road were in excess of the 2000 vehicles per day threshold.

That being said, MassHighway is currently piloting a new program, the Footprint Roads Program which, if fully adopted will allow communities to use the TIP process while still maintaining the existing roadway footprint. The Leverett, Cooleyville, Prescott Road project has been identified by the FRCOG as its regional pilot project for the program. For additional details on this program, call Maureen Mullaney, FRCOG Transportation Program Manager at 413-774-1194 (Ext 108).

The Public Works Economic Development Program

The Public Works Economic Development (PWED) Program was established through and is funded by the Transportation Bond. It provides funding to assist Towns in their efforts to create economic development through infrastructure improvement projects.

Eligible PWED projects include roadway and bridge improvements, sidewalk or lighting installation, traffic control facilities, and drainage or culvert work. The project must, however, retain, expand or establish industrial or commercial facilities, create or retain long-term employment opportunities, have a positive impact on the local tax base, or strengthen the partnership between the public and private sector. Ineligible PWED projects include sewage systems, water systems, or projects on which construction has been initiated. PWED projects cannot exceed \$1 million unless the Secretary of the Executive Office of Transportation and Construction deems the project to have regional impact.

Funding for the PWED program is allocated on a first come-first served basis. The total cost of a PWED project is funded, there is no local match requirement. Towns interested in pursuing a PWED project should contact the transportation planning staff at the Franklin Regional Council of Governments for an application.

The Small Town Road Assistance Program

The Small Town Road Assistance Program (STRAP) was established through and is funded by the Transportation Bond. It provides funding to towns with populations less than 3,500 for transportation improvement projects.

Eligible STRAP projects are transportation projects that improve public safety or emphasize economic development. Right-of-way takings cannot be funded with STRAP funds. Projects cannot exceed \$500,000. Towns approved to receive STRAP funds will receive 70% of the total cost of the project as a grant. The remaining project cost (30%) is given to the town in the form of a loan which the town must repay within ten years of the project's completion. The Massachusetts Department of Revenue arranges the repayment plan. The loan payment is deducted from the town's Local Aid Cherry Sheet over the ten year period. A town may receive a STRAP grant once every five years. STRAP funding is allocated on a first come-first served basis. Applications for STRAP funding are available at the MassHighway District offices. However, STRAP application submittals should be sent directly to the Secretary of the Executive Office of Transportation and Construction at the Transportation Building, Ten Park Plaza, Suite 3170, Boston, MA 02116.

Conclusion

The Town should continue to monitor the paved road maintenance needs over the next several years and explore and utilize alternative funding sources when necessary to ensure that the paved road network continues to be maintained in a perpetual Good to Excellent condition.

Appendices

Appendix A

Average Annual Daily Traffic (AADT) Count Data 1991-2002 For the Town of Shutesbury

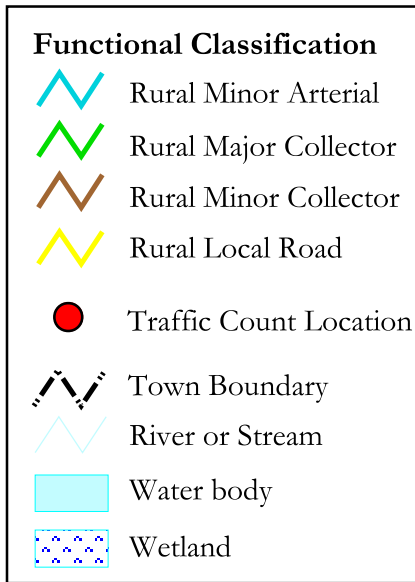
Appendix A: Average Annual Daily Traffic (AADT) Count Data 1991-2002

StationID	Street/Route	Location	Average Annual Daily Traffic (AADT) Volumes											
			1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
2720001	Baker Road	Btwn West Pelham Road & Pelham Hill Road	200											
2720020	Cushman Road	200ft West of Cross Road												170
2720019	Cushman Road	Amherst Town Line												230
2720002	Lakeview Road	Btwn Locks Pond Road & Farrar Road	740						810			920		
2720003	Leverett Road	³ / ₁₀ mile East of Pratts Corner Road	1380					1620			1680	1620		
2720016	Leverett Road	Btwn Pelham Hill Road & Wendell Road										1750		
2720004	Locks Pond Road	¹ / ₄ mile North of Old Orchard Road							570			620		
2720017	Montague Road	¹ / ₁₀ mile North of Leverett Road											450	
2720013	Montague Road	¹ / ₄ mile South of Dudleyville	560						150					
2720005	Montague Road	¹ / ₄ mile South of Leverett Town Line			170								170	200
2720006	Pelham Hill Road	200ft South of Baker Road	340						310			300		280
2720012	Pelham Hill Road	500ft North of Baker Road									340			
2720018	Pelham Hill Road	¹ / ₁₀ mile South of Leverett Road												400
2720007	Prescott Road	¹ / ₁₀ mile West of Route 202						800				810		
2720015	Route 202	² / ₁₀ mile North of Pelham Town Line										3200	3300	2800
2720008	Schoolhouse Road	South of Baker Rd	120											
2720014	Wendell Road	Wendell Town Line			800				670			740		730
2720009	Wendell Road	⁶ / ₁₀ mile North of Leverett Road	600					810			910	890		
2720010	West Pelham Road	200ft South of Leverett Road							840			810		
2720011	West Pelham Road	³ / ₄ mile South of Leverett Rd	660						520			630		

Source: Franklin Regional Council of Governments Traffic Count Database

TOWN OF SHUTESBURY PAVEMENT MANAGEMENT STUDY SCENARIO 2

Appendix A - Traffic Count Locations

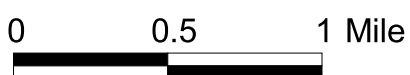
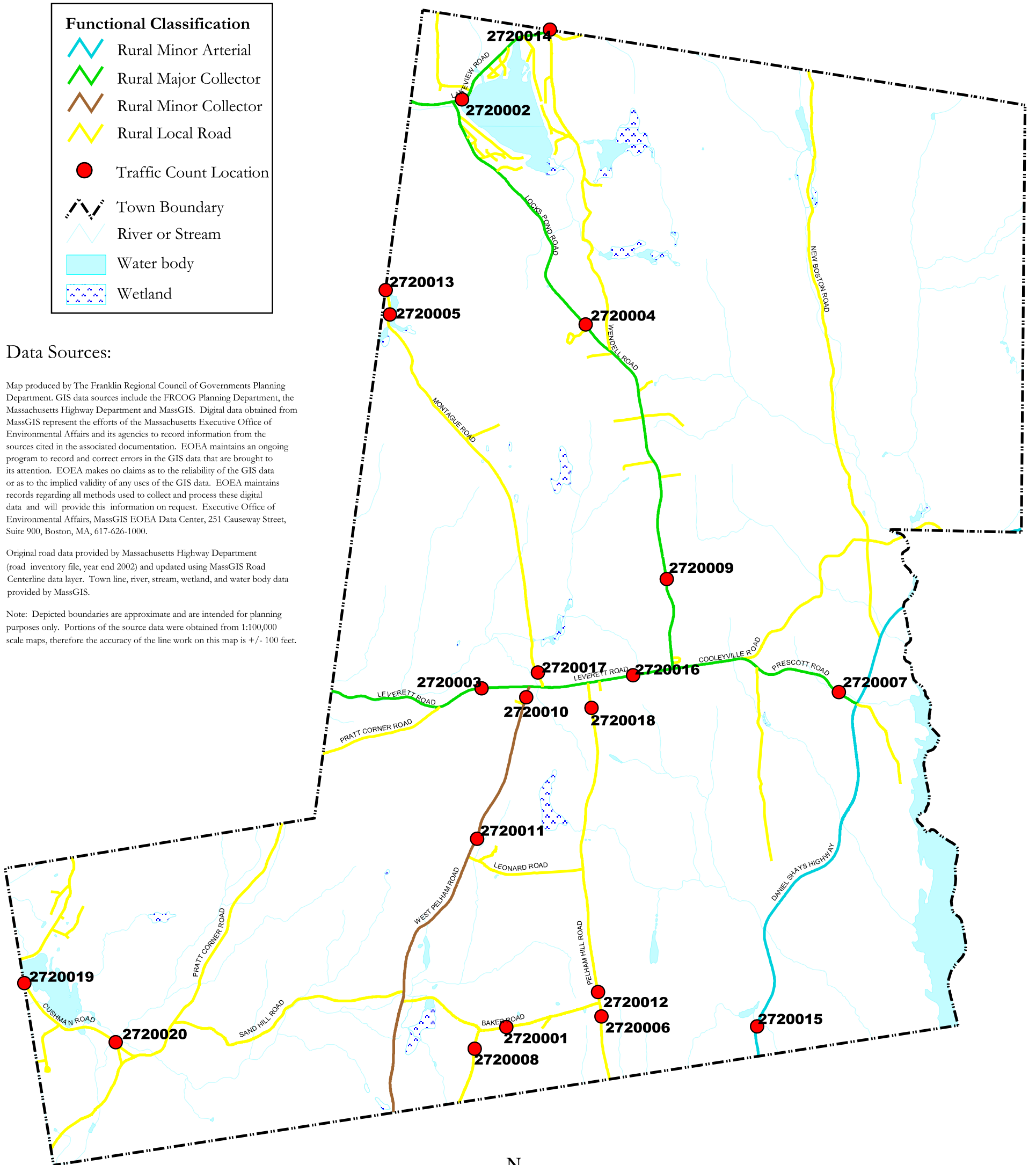


Data Sources:

Map produced by The Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, the Massachusetts Highway Department and MassGIS. Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. EOEa maintains an ongoing program to record and correct errors in the GIS data that are brought to its attention. EOEa makes no claims as to the reliability of the GIS data or as to the implied validity of any uses of the GIS data. EOEa maintains records regarding all methods used to collect and process these digital data and will provide this information on request. Executive Office of Environmental Affairs, MassGIS EOEa Data Center, 251 Causeway Street, Suite 900, Boston, MA, 617-626-1000.

Original road data provided by Massachusetts Highway Department (road inventory file, year end 2002) and updated using MassGIS Road Centerline data layer. Town line, river, stream, wetland, and water body data provided by MassGIS.

Note: Depicted boundaries are approximate and are intended for planning purposes only. Portions of the source data were obtained from 1:100,000 scale maps, therefore the accuracy of the line work on this map is +/- 100 feet.



Appendix A: Average Annual Daily Traffic (AADT) Count Data 1991-2002

Appendix B
Existing Pavement Conditions
Analysis Results

Appendix B: Glossary of Terms for Data Format

Street Name - Street Name prefixed with the Municipalities three digit code.

* Indicates the road section is eligible to receive Federal Aid for Reconstruction.

Section From - Start point of the individual section.

Section To - End point of the individual section.

Length (ft) - The length of the section, measured in feet.

PCI - Pavement Condition Index 95 - 100 indicates the pavement is in **Excellent** condition,
85 - 94 indicates the pavement is in **Good** condition;
65 - 84 indicates the pavement is in **Fair** condition;
0 - 64 indicates the pavement is in **Poor** condition.

Repair Code - 1. Reconstruction; (\$30 sq/yd)
 2. Rehabilitation; (\$10 sq/yd)
 3. Preventative Maintenance; (\$7.50 sq/yd)
 4. Routine Maintenance; (\$2.50 sq/yd)
 5. No Immediate Maintenance. (\$0 sq/yd)

PMS Ranking - A ranking of all the sections requiring repair, based on a cost/benefit produced by the RoadManager software through the Benefit Value. The section with the highest Benefit Value has received a PMS Ranking of 1. Sections with equal Benefit Values have received the same ranking. In total there are 146 ranked sections.

Estimated ADT - Average Daily Traffic traveling on each section of road. Generally, traffic count data was available on the higher volume roads. Where data was not available, estimates were made based on the functionality of the road and the number of houses or businesses they served.

Survey Date - Date on which the pavement distress data was collected.

NOTE:

The information contained in these tables was created from a visual evaluation of the pavement surface in which the severity and extent of the observed distresses were estimated. The recommended repair strategies and the associated costs are not final. A more detailed engineering evaluation must be conducted before finalizing any repairs and their associated costs. The information presented here can be used as a tool for preliminary evaluation and prioritization of the paved road network as a whole.

Appendix B: Existing Pavement Conditions (Fall 2002)
Alphabetical List of Town Maintained Paved Roads

STREET NAME	SECTION ID #	SECTION FROM:	SECTION TO:	LENGTH (ft)	PCI	REPAIR CODE	ESTIMATED COST	PMS RANK	ESTIMATED ADT	SURVEY DATE
BAKER ROAD	1	PELHAM HILL ROAD	GRAVEL	528	100	5	\$0		200	10/21/02
BAKER ROAD	3	SCHOOL HOUSE ROAD	GRAVEL	898	55	2	\$14,967	3	200	10/21/02
COOLEYVILLE ROAD	2	PRESCOTT ROAD	WENDELL ROAD	2165	99	5	\$0		1000	10/17/02
FARRAR ROAD	1	LAKEVIEW ROAD	GRAVEL	211	99	5	\$0		100	10/17/02
JANUARY HILLS RD.	1	AMHERST TOWN LINE	LEVERETT TOWN LINE	4066	88	5	\$0		250	10/21/02
LAKEVIEW ROAD	1	WENDELL ROAD	PARK ENTRANCE	2640	100	5	\$0		1000	10/17/02
LAKEVIEW ROAD	2	PARK ENTRANCE	LEVERETT TOWN LINE	2851	98	5	\$0		1000	10/17/02
LEVERETT ROAD	1	WENDELL ROAD	MONTAGUE ROAD	4752	84	4	\$30,360	1	2000	10/17/02
LEVERETT ROAD	2	MONTAGUE ROAD	PRATT CORNER ROAD	3168	99	5	\$0		2000	10/17/02
LEVERETT ROAD	3	PRATT CORNER ROAD	LEVERETT TOWN LINE	3696	78	2	\$98,560	2	2000	10/17/02
LOCKS POND ROAD	1	LAKEVIEW ROAD	GREAT PINES ROAD	2112	95	5	\$0		750	10/17/02
LOCKS POND ROAD	2	GREAT PINES ROAD	#110 LOCKS POND RD	5280	89	5	\$0		750	10/17/02
LOCKS POND ROAD	3	#110 LOCKS POND RD	WENDELL ROAD	2640	89	5	\$0		750	10/17/03
PELHAM HILL ROAD	1	LEVERETT ROAD	LEONARD ROAD	5808	99	5	\$0		400	10/21/02
PELHAM HILL ROAD	2	LEONARD ROAD	GRAVEL	4646	94	5	\$0		350	10/21/02
PRESCOTT ROAD	1	COOLEYVILLE ROAD	ROUTE 202	4382	99	5	\$0		1000	10/17/02
SCHOOL DRIVE	1	WEST PELHAM ROAD	DEAD END	317	99	5	\$0		50	10/21/02
STOWELL ROAD	1	WENDELL ROAD	DEAD END	581	74	4	\$2,098	6	5	10/17/02
TOWN COMMON RD.	1	WENDELL ROAD	WENDELL ROAD	581	66	3	\$3,873	5	5	10/17/02
WEATHERWOOD RD.	1	CUSHMAN ROAD	CUL-DE-SAC	1848	65	3	\$40,040	4	50	10/21/02
WENDELL ROAD	1	LEVERETT ROAD	POLE 27 (PAVE CHNGE)	3696	99	5	\$0		1000	10/17/02
WENDELL ROAD	2	POLE 27 (PAVE CHNGE)	LOCKS POND ROAD	7339	90	5	\$0		1000	10/17/02
WENDELL ROAD	4	GRAVEL	WENDELL TOWN LINE	158	100	5	\$0		1000	10/17/02
WEST PELHAM RD.	1	LEVERETT ROAD	LEONARD ROAD	5280	99	5	\$0		1000	10/21/02
WEST PELHAM RD.	2	LEONARD ROAD	POLE 203	1584	100	5	\$0		750	10/21/02
WEST PELHAM RD.	3	POLE 203	BAKER ROAD	3696	95	5	\$0		750	10/21/02
WEST PELHAM RD.	4	BAKER ROAD	PELHAM TOWN LINE	4171	95	5	\$0		750	10/21/02

**Appendix B: Existing Pavement Conditions (Fall 2002)
Ranked List of Town Maintained Paved Roads**

STREET NAME	SECTION ID #	SECTION FROM:	SECTION TO:	LENGTH (ft)	PCI	REPAIR CODE	ESTIMATED COST	PMS RANK	ESTIMATED ADT	SURVEY DATE
LEVERETT ROAD	1	WENDELL ROAD	MONTAGUE ROAD	4752	84	4	\$30,360	1	2000	10/17/02
LEVERETT ROAD	3	PRATT CORNER ROAD	LEVERETT TOWN LINE	3696	78	2	\$98,560	2	2000	10/17/02
BAKER ROAD	3	SCHOOL HOUSE ROAD	GRAVEL	898	55	2	\$14,967	3	200	10/21/02
WEATHERWOOD RD.	1	CUSHMAN ROAD	CUL-DE-SAC	1848	65	3	\$40,040	4	50	10/21/02
TOWN COMMON RD.	1	WENDELL ROAD	WENDELL ROAD	581	66	3	\$3,873	5	5	10/17/02
STOWELL ROAD	1	WENDELL ROAD	DEAD END	581	74	4	\$2,098	6	5	10/17/02
BAKER ROAD	1	PELHAM HILL ROAD	GRAVEL	528	100	5	\$0		200	10/21/02
COOLEYVILLE ROAD	2	PRESCOTT ROAD	WENDELL ROAD	2165	99	5	\$0		1000	10/17/02
FARRAR ROAD	1	LAKEVIEW ROAD	GRAVEL	211	99	5	\$0		100	10/17/02
JANUARY HILLS RD.	1	AMHERST TOWN LINE	LEVERETT TOWN LINE	4066	88	5	\$0		250	10/21/02
LAKEVIEW ROAD	1	WENDELL ROAD	PARK ENTRANCE	2640	100	5	\$0		1000	10/17/02
LAKEVIEW ROAD	2	PARK ENTRANCE	LEVERETT TOWN LINE	2851	98	5	\$0		1000	10/17/02
LEVERETT ROAD	2	MONTAGUE ROAD	PRATT CORNER ROAD	3168	99	5	\$0		2000	10/17/02
LOCKS POND ROAD	1	LAKEVIEW ROAD	GREAT PINES ROAD	2112	95	5	\$0		750	10/17/02
LOCKS POND ROAD	2	GREAT PINES ROAD	#110 LOCKS POND RD	5280	89	5	\$0		750	10/17/02
LOCKS POND ROAD	3	#110 LOCKS POND RD	WENDELL ROAD	2640	89	5	\$0		750	10/17/03
PELHAM HILL ROAD	1	LEVERETT ROAD	LEONARD ROAD	5808	99	5	\$0		400	10/21/02
PELHAM HILL ROAD	2	LEONARD ROAD	GRAVEL	4646	94	5	\$0		350	10/21/02
PRESCOTT ROAD	1	COOLEYVILLE ROAD	ROUTE 202	4382	99	5	\$0		1000	10/17/02
SCHOOL DRIVE	1	WEST PELHAM ROAD	DEAD END	317	99	5	\$0		50	10/21/02
WENDELL ROAD	1	LEVERETT ROAD	POLE 27 (PAVE CHNGE)	3696	99	5	\$0		1000	10/17/02
WENDELL ROAD	2	POLE 27 (PAVE CHNGE)	LOCKS POND ROAD	7339	90	5	\$0		1000	10/17/02
WENDELL ROAD	4	GRAVEL	WENDELL TOWN LINE	158	100	5	\$0		1000	10/17/02
WEST PELHAM RD.	1	LEVERETT ROAD	LEONARD ROAD	5280	99	5	\$0		1000	10/21/02
WEST PELHAM RD.	2	LEONARD ROAD	POLE 203	1584	100	5	\$0		750	10/21/02
WEST PELHAM RD.	3	POLE 203	BAKER ROAD	3696	95	5	\$0		750	10/21/02
WEST PELHAM RD.	4	BAKER ROAD	PELHAM TOWN LINE	4171	95	5	\$0		750	10/21/02

